OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin - Conduct of Operations

TASK: Calculate Shutdown Margin IAW SC.RE-ST.ZZ-0002

TASK NUMBER: N1200030301

JPM NUMBER: 19-01 NRC RO-A1

ALTERNATE PATH: [ ] **K/A NUMBER:** 2.1.43

IMPORTANCE FACTOR: 4.1

APPLICABILITY: **RO** **SRO**

EO [ ] **RO** [X] **STA** [ ] **SRO** [ ]

EVALUATION SETTING/METHOD: Classroom / Perform

REFERENCES: SC.RE-ST.ZZ-0002(Q), Rev. 24 SHUTDOWN MARGIN CALCULATION
S2.RE-RA.ZZ-0016(Q), Rev. 11 CURVE BOOK (both checked 1-14-20)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 30 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: 60 minutes

Developed By:	**R. Chan** **Instructor**	**Date: 1-14-20**
Validated By:	**Klein / Weidner** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

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 225 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 for a misaligned rod.
- Control Rod 1D5 has been identified as **trippable** and is currently at 214 steps.

INITIATING CUE:

- You have been directed to perform a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 Attachment 3 to satisfy the **one (1) hour** action requirement of TSAS 3.1.3.1 Action c.3 to verify Shutdown Margin requirements is satisfied.
- When performing calculation, the CRS directs you to use **only the tables** as directed by SC.RE-ST.ZZ-0002, do not use Figures.
- **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. **Perform SDM calculation ≤ 1 hour and determines SDM of -2398 (+/- 5 pcm) is satisfactory.**

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
		Obtains copy of procedure SC.RE-ST.ZZ-0002(Q). Obtains copy of S2.RE-RA.ZZ-0016 Curve Book.	Provide **Rev. 24** of surveillance. Provide **Rev. 11** of Curve Book.		
	CUE:	When the operator acknowledges ready to start JPM RECORD START TIME. **START:**_____			
	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 4.1.1.1.1.a) with reactor critical (Mode 1 or 2) and one or more control rods are inoperable, THEN **COMPLETE** Attachment 3.	Refers to Attachment 3.		
	Att. 3 2.1	The reactor is in Mode 1 or Mode 2 with $k_{eff} \geq 1.0$	Determines Unit is in Mode 1.		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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 3.0	Precautions and Limitations: Section 3.0	Reviews and signs steps 3.1-3.5.		
*	Section 4.1	Critical Conditions	**Determines the following data and calculations:** **4.1.1 100%** **4.1.2 300 ppm** **4.1.3 D @ 225 steps** **4.1.4 10,000 EFPH** **4.1.5 0** **4.1.6 1**		
*	Section 4.2	Calculation of Rod Worth **Examiner's Note**: Step 4.2.6 is determined based on the position of the rod BANK and not the position of the misaligned rod. Since all rods are at ARO position, penalty is 0 pcm.	**4.2.1 -3697** **4.2.2 -3581** **4.2.3 920** **4.2.4 0** **4.2.5 500** **4.2.6 0** **4.2.7 -5858**		
*	Section 4.3	Calculation of SDM	**4.3.1 -5858** **4.3.2 636** **4.3.3 120** **4.3.4 2704** **4.3.5 -2398**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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	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 Note**: See Answer Key for completed Attachment 3		
	CUE	MARK stop time of JPM when procedures are returned to proctor. **STOP:**_____	JPM is Complete when operator submits Attachment to Evaluator.		

Table G Data Points for Curvebook Figure 15

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

Cycle Burnup (EFPH)	Control Bank Worth (pcm)		
	68 °F	350 °F	547 °F
0.0	3098	3448	3878
100.0	3098	3454	3886
1000.0	3002	3347	3777
2000.0	2896	3227	3657
3000.0	2840	3163	3594
4000.0	2823	3143	3576
5000.0	2809	3126	3562
6000.0	2822	3141	3580
7000.0	2835	3156	3598
8000.0	2859	3180	3627
9000.0	2887	3209	3661
10000.0	2916	3240	3697
11000.0	2950	3276	3739
12000.0	2985	3312	3782
12502.7	3002	3330	3803

Table H Data Points for Curvebook Figure 16

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

Cycle Burnup (EFPH)	Shutdown Bank Worth (pcm)		
	68 °F	350 °F	547 °F
0.0	2258	2394	2552
100.0	2250	2378	2541
1000.0	2425	2546	2703
2000.0	2618	2732	2883
3000.0	2776	2880	3023
4000.0	2906	2999	3131
5000.0	3033	3115	3235
6000.0	3139	3205	3313
7000.0	3245	3295	3391
8000.0	3340	3375	3458
9000.0	3429	3451	3521
10000.0	3516	3524	3581
11000.0	3593	3589	3633
12000.0	3671	3654	3686
12502.7	3710	3686	3712

Table I Data Points for Curvebook Figure 14

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

Cycle Burnup (EFPH)	Worst Stuck Rod Worth (pcm)		
	68 °F	350 °F	547 °F
0.0	1010	1038	992
100.0	1011	1046	1000
1000.0	882	925	900
2000.0	739	791	790
3000.0	712	740	757
4000.0	776	756	784
5000.0	839	772	812
6000.0	903	787	840
7000.0	977	806	861
8000.0	1052	825	881
9000.0	1124	850	901
10000.0	1191	882	920
11000.0	1258	915	939
12000.0	1325	947	958
12502.7	1359	964	968

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

Cycle Burnup (EFPH)	Worst Stuck Rod Location		
	68 °F	350 °F	547 °F
0.0	K-06	K-06	K-06
91.5	K-06	K-06	K-06
2439.6	K-06	K-06	K-06
6098.9	L-03	H-06	H-06
8538.5	L-03	K-08	H-06
12502.7	N-05	L-03	K-08

Table 1-6

Summary of Control Rod Worths

HZP, No Xe

Burnup (EFPH)		Control Banks (pcm)	Shutdown Banks (pcm)	Control and Shutdown Banks (pcm)
BOL	0.0	3877.5	2552.4	6429.9
MRDS	2439.6	3603.8	2961.7	6565.5
MOL	6098.9	3575.4	3325.8	6901.2
LFPC	11381.8	3753.3	3654.6	7407.9

Rod Worth Penalty to Use for Modes 1, 2

Event A	Rod Worth Penalty (pcm) BOL to < MOL (6098.9 EFPH)	Rod Worth Penalty (pcm) MOL (6098.9 EFPH) to EOL
One Untrippable RCCA	2005	2165

Event B	Rod Worth Penalty (pcm) BOL to EOL
Two or more Untrippable RCCAs	2165

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 One or more Failed IRPI	2980

Highest (ARI-1) Stuck Rod Worths for Cycle 24

Burnup (EFPH)		Rod Location	Temperature (°F)	Rod Worths (pcm)
BOL	0.0	K-06	547.0	1110.5*
MRDS	2439.6	K-06	547.0	836.4
MOL	6098.9	K-08	547.0	935.0
LFPC	11381.8	K-08	547.0	1062.2

*Highest stuck rod worth for all conditions

The EFPH to MWD/MTU conversion factor is 1.63964 MWD/MTU/EFPH

Table 2-1 (Continued)

Data Points for Curvebook Figure 17A
EOL Total Power Defect (pcm) as a Function of Power and Boron Concentration
Burnup = 11381.8 EFPH, Range = 8740.4 EFPH - EOL

Power Level (%)	Boron Concentration (ppm)															
	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	177	175	174	172	170	169	167	166	164	163	161	160	158	157	156	154
10	347	343	340	337	333	330	327	324	321	318	315	313	310	307	305	302
15	509	505	500	495	490	486	481	477	472	468	464	460	456	452	448	444
20	666	660	654	647	641	635	629	623	618	612	607	601	596	591	586	581
25	818	810	802	795	787	780	773	765	758	752	745	738	732	725	719	713
30	965	956	947	938	929	920	912	903	895	887	879	871	863	856	848	841
35	1109	1098	1088	1077	1067	1057	1047	1037	1028	1018	1009	1000	991	983	974	965
40	1250	1238	1226	1214	1202	1191	1179	1168	1158	1147	1136	1126	1116	1106	1096	1087
45	1389	1375	1361	1348	1335	1322	1309	1297	1285	1273	1261	1250	1238	1227	1216	1205
50	1526	1510	1495	1480	1466	1451	1437	1424	1410	1397	1384	1371	1358	1346	1334	1322
55	1661	1644	1628	1611	1595	1579	1564	1549	1534	1519	1505	1491	1477	1463	1450	1436
60	1797	1778	1760	1742	1724	1707	1690	1673	1656	1640	1625	1609	1594	1579	1564	1550
65	1932	1912	1891	1872	1852	1833	1815	1796	1778	1761	1744	1727	1710	1694	1678	1662
70	2068	2045	2023	2002	1980	1960	1939	1920	1900	1881	1862	1844	1826	1808	1790	1773
75	2204	2180	2156	2132	2109	2087	2064	2043	2022	2001	1981	1961	1941	1922	1903	1884
80	2342	2315	2289	2264	2239	2214	2190	2167	2144	2121	2099	2078	2056	2036	2015	1995
83	2425	2397	2370	2343	2317	2291	2266	2241	2217	2194	2171	2148	2126	2104	2083	2062
85	2481	2452	2424	2396	2369	2343	2317	2291	2266	2242	2218	2195	2172	2150	2128	2106
90	2622	2590	2560	2530	2501	2472	2444	2417	2390	2364	2338	2313	2289	2265	2241	2218
95	2764	2731	2698	2666	2634	2603	2573	2544	2515	2487	2459	2432	2406	2380	2355	2330
99	2880	2844	2810	2775	2742	2709	2678	2646	2616	2586	2557	2528	2501	2473	2446	2420
100	2909	2873	2838	2803	2769	2736	2704	2672	2641	2611	2582	2553	2524	2497	2469	2443

ANSWER KEY

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2

SALEM UNIT 2

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.

1.5 To determine shutdown margin with a bank inserted beyond insertion limit specified in the COLR in accordance with T/S 3.1.3.4 and T/S 3.1.3.5.

2.0 **PREREQUISITES**

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

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 300 ppm

Answer Key

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2
Page 2 of 4

SALEM UNIT 2

4.1.3 BANK POSITION

CONTROL BANKS:	SHUTDOWN BANKS
BANK A at 225 STEPS	BANK A at 225 STEPS
BANK B at 225 STEPS	BANK B at 225 STEPS
BANK C at 225 STEPS	BANK C at 225 STEPS
BANK D at 225 STEPS	BANK D at 225 STEPS

4.1.4 BURNUP 10,000 EFPH

4.1.5 # OF UNTRIPPABLE RCCA(s) 0 RCCA(s)

4.1.6 # OF DROPPED OR MISALIGNED RCCA(s) 1 RCCA(s)

4.2 **CALCULATION OF ROD WORTH**

4.2.1 TOTAL CONTROL BANK WORTH (Figure 15/Table G) (-) 3697 pcm

4.2.2 TOTAL SHUTDOWN BANK WORTH (Figure 16/Table H) (-) 3581 pcm

4.2.3 MOST REACTIVE STUCK ROD WORTH (Figure 14/Table I) 920 pcm

NOTE
The reactivity worth for a single or multiple untrippable RCCAs and dropped or misaligned RCCAs comes from Table 1-6 S1(2).RE-RA.ZZ-0016, Curve Book. For multiple untrippable RCCAs, the penalty in 4.2.4 should have a maximum value of the sum of the total shutdown and control bank worths in steps 4.2.1 and 4.2.2.

4.2.4 PENALTY FOR UNTRIPPABLE RCCA(s) 0 pcm

0 (Item 4.1.5) x _____ (Table 1-6) =

4.2.5 PENALTY FOR DROPPED OR MISALIGNED RCCA(s) 500 pcm

1 (Item 4.1.6) x 500 (Table 1-6) =

Answer Key

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2
Page 3 of 4

SALEM UNIT 2

NOTE
If control bank B or C is inserted ≤ 10 steps beyond the rod insertion limit, the value in step 4.2.6 should be the integral rod worth from Table 1-8 at the violating bank's current position. This is a conservative estimate of the rod worth of any violation allowed in T.S. 3.1.3.5 Action 1.

CAUTION
Shutdown margin may only be calculated with 1 shutdown bank or control bank A, B, or C inserted beyond the RIL.

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) — 0 pcm

4.2.6.a **IF** any shutdown bank or control bank A is inserted ≤ 10 steps, record 90 pcm, otherwise record 0 pcm. — 0 pcm

4.2.6.b INTEGRAL ROD WORTH and Penalty (Item 4.2.6) + (Item 4.2.6.a) = — 0 pcm

NOTE
The penalties for untrippable RCCAs include the most reactive stuck rod worth. The most reactive stuck rod worth from step 4.2.3 is not needed when calculating the trippable rod worth with at least one untrippable RCCA.

4.2.7 **CHOOSE** the appropriate calculation below. **MARK** the calculation 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.b) = -5858 pcm

OR

TRIPPABLE ROD WORTH WITH UNTRIPPABLE RCCA(s) (Item 4.2.1) + (Item 4.2.2) + (Item 4.2.4) + (Item 4.2.5) + (Item 4.2.6.b) = NA pcm

4.3 **CALCULATION OF SDM (Note: See Precaution 3.4)**

4.3.1 TRIPPABLE ROD WORTH (Item 4.2.7) — -5858 pcm

4.3.2 TEN PERCENT ROD WORTH PENALTY (3697 + 3581 - 920) x 0.10 = (+) 636 pcm
abs(Item 4.2.1) abs(Item 4.2.2) (Item 4.2.3)

4.3.3 ROD MISALIGNMENT RELAXATION PENALTY — (+) 120 pcm

4.3.4 POWER DEFECT (Figure 17A/Table 2-1) — 2704 pcm

4.3.5 SDM (Item 4.3.1) + (Item 4.3.2) + (Item 4.3.3) + (Item 4.3.4)= — -2398 pcm

Answer Key

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2

SALEM UNIT 2

4.4 **ACCEPTANCE CRITERIA**

NOTE
REQUIRED SDM (per T/S 3.1.1.1) MODE 1 OR 2:
(-)1.3 % Δk/k = (-)1300 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: _____

NOTE
If the required power defect in step 4.4.2.A is negative, then it is not possible to meet SDM by lowering reactor power and step 4.4.2.B will be 0%.

NA 4.4.2 IF the SDM is UNSAT, THEN **PERFORM** the following:

A. **CALCULATE** the power defect required to achieve required SDM.

_____ (abs(Item 4.3.1)) - _____ (Item 4.3.2) - 120 pcm (Item 4.3.3) - 1300 pcm = _____ 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)

_____ %RTP

NA C. **NOTIFY** SM/CRS to initiate rapid boration, IAW S1(2).OP-SO.CVC-0008(Q), Rapid Boration, and reduce reactor power UNTIL the required SDM is attained.

Completed by: _____ Date: _____ Time: _____

Reviewed by: _____ Date: _____ 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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __24___ Date ____1-14-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-14-20

SME/Instructor: J. Klein Date: 1-16-20

SME/Instructor: Z. Weidner Date: 1-16-20

INITIAL CONDITIONS:

- Unit 2 Reactor Power is 100%.
- All Control Rod Group Demand Counters are at 225 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 for a misaligned rod.
- Control Rod 1D5 has been identified as **trippable** and is currently at 214 steps.

INITIATING CUE:

- You have been directed to perform a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 Attachment 3 to satisfy the **one (1) hour** action requirement of TSAS 3.1.3.1 Action c.3 to verify Shutdown Margin requirements is satisfied.
- When performing calculation, the CRS directs you to use **only the tables** as directed by SC.RE-ST.ZZ-0002, do not use Figures.
- **This is a Time Critical JPM.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative Topic - Conduct of Operations

TASK: Verification of Active License Status

TASK NUMBER: N1200030301

JPM NUMBER: 19-01 NRC RO-A2

ALTERNATE PATH: [ ]

K/A NUMBER: 2.1.4

IMPORTANCE FACTOR: 3.3 (RO) / ____ (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [ ]

EVALUATION SETTING/METHOD: Classroom / Perform

REFERENCES: OP-AA-105-101, Rev 16 & OP-AA-105-102, Rev 12 (checked 1-15-20)
RP-AA-440, Rev 10

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 30 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: NA

Developed By:	**R. Chan** **Instructor**	**Date: 1-15-20**
Validated By:	**Klein / Weidner** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Administrative Topic - Conduct of Operations

TASK: Verification of Active License Status

TASK NUMBER: N1200030301

INITIAL CONDITIONS:

- Both Units are operating at 100% power.
- Today is January 1, 2020.
- You are the on-shift RO on Unit 1.
- You must leave the shift.
- There are three replacement operators that are available on-site.

INITIATING CUE:

- Using the provided information, determine which of the three operators, if any, are qualified to relieve you IAW OP-AA-105-102, NRC Active License Maintenance and OP-AA-105-101, Administrative Process For NRC License and Medical Requirements**.**
- If any operators are not qualified, briefly explain why?

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. **Operator determines that RO #3 can relieve him.**
2. **Operator determines that RO#1 is not qualified due to not meeting the 72 hour shift hour requirement <u>and</u> RO#2 is not qualified due to not meeting license restrictions for wearing corrective lenses.**

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topic - Conduct of Operations

Task: Verification of Active License Status

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**Provide** copies of the following procedures: 1. OP-AA-105-101 2. OP-AA-105-102 3. RP-AA-440			
	CUE:	When the operator acknowledges ready to start JPM RECORD START TIME. **START:**_____			
*	1	Reviews RO #1 data and determines eligibility for relief	**Determines that RO #1 is not qualified to relieve the RO due to not having the minimum five 12-hour shifts per calendar quarter IAW OP-AA-105-102 section 4.1.1.1 (page 4).**		
*	2	Reviews RO #2 data and determines eligibility for relief	**Determines that RO #2 is not qualified to relieve the RO due to not having the required corrective lenses IAW NRC Form 396 medical form restriction for corrective lenses.**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topic - Conduct of Operations

Task: Verification of Active License Status

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	3	Reviews RO #2 data and determines eligibility for relief	**Determines that RO #3 is qualified to relieve the RO on Unit 1.**		
	CUE	MARK stop time of JPM when procedures are returned to proctor. **STOP:**_____	JPM is Complete when operator submits Attachment to Evaluator.		

4.0 INSTRUCTIONS

NOTE

The quarterly shift watch requirement may be completed with a combination of complete 8- and 12-hour shifts (in a position appropriately credited for watch-standing proficiency as discussed below) at sites having a mixed shift schedule, and watches shall **NOT** be truncated when the minimum quarterly requirement (56 hours) is satisfied. (NUREG 1021, Revision 9).

4.1 Active License Maintenance

NOTE

As specified in 10 CFR 55.4, "Definitions," "Actively performing the functions of an operator or senior operator," means that "the individual carries out and is responsible for the duties covered by that position". For RO and SRO watches being credited for license maintenance, administrative tasks not related to the licensed position should be minimized. Non-position related administrative tasks performed outside the control room, e.g., NRC physicals, all hands meetings, etc., shall not be scheduled during a credited shift. Non-position related administrative tasks performed inside the control room are allowed during a credited shift provided the activities do not impact the individual's ability to perform assigned licensed responsibilities; i.e., the individual is in a position to provide prompt assistance to or oversight of the RO at the controls.

4.1.1. **MAINTAIN** an active license by actively performing the functions of RO, SRO or LSRO.

1. RO licenses by performing the duties of the Unit RO and/or Unit PO for a minimum of seven 8-hour or five 12-hour shifts per calendar quarter, including turnover to the next shift.

2. SRO licenses by performing the duties of Shift Manager or Unit Supervisor for a minimum of seven 8-hour or five 12-hour shifts per calendar quarter, including turnover to the next shift.

3. RO/SRO licenses by performing the duties of Unit RO or Supervisor.

1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1. This procedure describes the administrative process for United States Nuclear Regulatory Commission (NRC) licenses, including initial license applications, license renewal, Biennial Medical Examinations, and updates to the NRC to report changes in an individual's license status.

1.2 Scope

1.2.1. None.

2.0 DEFINITIONS

2.1 Action Tracking / Action Tracking Item

2.1.1. Refers to the formal program used by the site to track performance of specific action items and commitments. SAP is an example of a formal program used for tracking.

2.2 Annual

2.2.1. Once per calendar year. For example, an annual test last performed in January 2009, would be due again by January 31, 2010.

2.3 Applicant

2.3.1. Person applying for a NRC Reactor Operator, Senior Reactor Operator, or Senior Reactor Operator - Limited license.

2.4 Biennial Medical Examination

2.4.1. The medical examination given every 2 years, required by the NRC for all licensed individuals. For purposes of the medical examination, "biennial" is a period of time equal to 730 days and synonymous with the term "two years".

ANSWER KEY

	Qualified for Relief? (Yes / No)	State reason if not qualified for relief.
RO #1	NO	**Does not having the minimum five 12-hour shifts per calendar quarter IAW OP-AA-105-102 section 4.1.1.1 (page 4).**
RO #2	NO	**Does not have the required corrective lenses IAW NRC Form 396 medical form restriction for corrective lenses.**
RO #3	YES	**Meets all requirements.**

ANSWER KEY

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date (see cover sheet)

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-15-20

SME/Instructor: J. Klein Date: 1-16-20

SME/Instructor: Z. Weidner Date: 1-16-20

INITIAL CONDITIONS:

- Both Units are operating at 100% power.
- Today is January 1, 2020.
- You are the on-shift RO on Unit 1.
- You must leave the shift.
- There are three replacement operators that are available on-site.

INITIATING CUE:

- Using the provided information, determine which of the three operators, if any, are qualified to relieve you IAW OP-AA-105-102, NRC Active License Maintenance and OP-AA-105-101, Administrative Process For NRC License and Medical Requirements.
- If any operators are not qualified, briefly explain why?

	Qualified for Relief? (Yes / No)	**State reason if not qualified for relief.**
RO #1		
RO #2		
RO #3		

Record of Shifts Performed During Fourth Quarter 2019:

	Date	Shift Position	No. Hours	Comments
RO#1	11/2/19	Unit 2 RO	0600-1800	
	11/3/19	Unit 2 PO	0600-1800	
	11/4/19	Unit 2 RO	0600-1800	Attended All Hands meeting at Processing Center for 1 hour, then attended Unit 2 Outage planning meeting in B Bldg for 1 hour.
	11/5/19	Unit 2 PO	0600-1800	
	12/24/19	Unit 1 RO	0600-1800	
RO #2	10/7/19	Unit 1 RO	0600-1800	
	10/8/19	Unit 1 PO	0600-1800	
	10/9/19	Unit 2 PO	0600-1800	
	10/10/19	Unit 2 PO	0600-1800	
	11/28/19	Unit 2 PO	0600-1800	
RO #3	10/18/19	Unit 1 RO	0600-1800	
	10/19/19	WCC NCO	0600-1800	
	10/20/19	Unit 2 PO	0600-1800	
	11/28/19	Unit 2 RO	0600-1800	
	11/29/19	Unit 2 PO	0600-1800	
	12/25/19	Unit 1 PO	0600-1800	

Additional Information:

	Status of Requalification Training	Date of Last SCBA Mask Fit Test	Date of Most Recent Respiratory Examination on File	Date of most Recent NRC Form 396 on File (Biennial Medical Exam)	Comments
RO #1	All requirements of TQ-AA-106, Licensed Operator Requal Training Program, are up to date and satisfactorily completed.	11/18/19	11/18/19	10/10/19 **Restrictions**: None	
RO #2	All requirements of TQ-AA-106, Licensed Operator Requal Training Program, are up to date and satisfactorily completed.	7/1/19	7/1/19	7/1/19 **Restrictions**: Corrective lenses shall be worn when performing licensed duties.	RO stated that he left his prescription eye glasses at home.
RO #3	All requirements of TQ-AA-106, Licensed Operator Requal Training Program, are up to date and satisfactorily completed.	4/9/19	4/9/19	9/15/19 **Restrictions**: Shall take medication as prescribed to maintain medical qualifications.	RO stated that he has his blood pressure medication with him and has taken the prescribed dosage for the day.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION:	SALEM
SYSTEM:	Generic Administrative Topic – Equipment Control
TASK:	Identify Components to Isolate a Service Water System Leak Using Station Drawings
TASK NUMBER:	N1220050302
JPM NUMBER:	19-01 NRC RO-A3
ALTERNATE PATH:	☐
K/A NUMBER:	2.2.41
IMPORTANCE FACTOR:	RO: 3.5 SRO:
APPLICABILITY:	EO ☐ RO ☒ STA ☐ SRO ☐
EVALUATION SETTING/METHOD:	Classroom / Perform
REFERENCES:	205342 Sheets 1 thru 7 (checked 1-15-20)
TOOLS AND EQUIPMENT:	None
VALIDATED JPM COMPLETION TIME:	30 min
TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS:	N/A

Developed By:	**R. Chan** **Instructor**	**Date:**	**1-15-20**
Validated By:	**Klein / Weidner** **SME or Instructor**	**Date:**	**1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**	
Approved By:	**N/A** **Operations Department**	**Date:**	

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: ☐ **SAT** ☐ **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 19-01 NRC RO-A3

Rev #	Date	Description	Validation Required
00	7-30-19	**NEW JPM for 19-01 NRC ILOT Exam.** **K/A 2.2.41: Ability to obtain and interpret station electrical and mechanical drawings. RO 3.5 / SRO 3.9**	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative Topic – Equipment Control

TASK: Identify Components to Isolate a Service Water System Leak Using Station Drawings

TASK NUMBER: N1220050302

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

1. **PROVIDE** clean copies of P&ID drawing 205342 sheets 1 thru 7.
2. **PROVIDE** highlighter or marker.

SYSTEM: Generic Administrative Topic – Equipment Control

TASK: Identify Components to Isolate a Service Water System Leak Using Station Drawings

TASK NUMBER: N1220050302

INITIAL CONDITIONS:

- Unit 2 is in a Refueling outage with the reactor defueled.
- A Service Water leak has been identified by your field operator on a 2 inch drain valve (21SW268) near the 21SW76 valve inside the SW Valve Room, Auxiliary Building.
- The 21SW76 is a manual isolation valve for the SW outlet of 21 CFCU.
- The 21SW268, 21 NUC HDR FROM FCV DRAIN, is a 2 inch drain valve downstream of the 21SW76, 21 CFCU SW OUTLET VLV.
- The field operator reports that the leak is at the body to bonnet location of the valve.

INITIATING CUE:

- You are the Work Control NCO.
- The Work Control SRO directs you to identify the **minimum** number of components needed to isolate the leak.
- Drains and vents are NOT required to be identified at this point.
- A complete work clearance (tagout) with all required blocking points will be performed in accordance with station procedures after leak isolation.
- Assume check valves will function as designed with no leak-by.
- Mark up (or circle components) on the provided P&ID drawings for the valves required to be closed **and** document your list of valves on this Cue Sheet:

SUCCESSFUL COMPLETION CRITERIA:

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

Task Standard for Successful Completion:

1. **Operator identifies the following valves on drawing 205342 as a <u>minimum</u> to be closed to isolate leak:**

21SW472 (sheet 3)

21SW355 (sheet 3)

21SW50 (sheet 3)

21SW414 (sheet 5)

21SW78 (sheet 6)

22SW76 (sheet 6)

21SW76 (sheet 6)

21SW646 (sheet 6)

22SW646 (sheet 6)

<u>Optional Valves</u>: These valves may be included but not necessary for leak isolation based on taking credit for check valve(s) preventing backflow:

- 21SW844 (sheet 3) check valves 21SW47 and 21SW79 upstream
- 21, 22, & 23SW45 (sheet 3) check valve 21SW79 downstream

2. Operator correctly marks up the required valves on the provided P&ID drawings (205342) IAW with the enclosed answer key within this JPM.

NAME:_____
DATE:_____

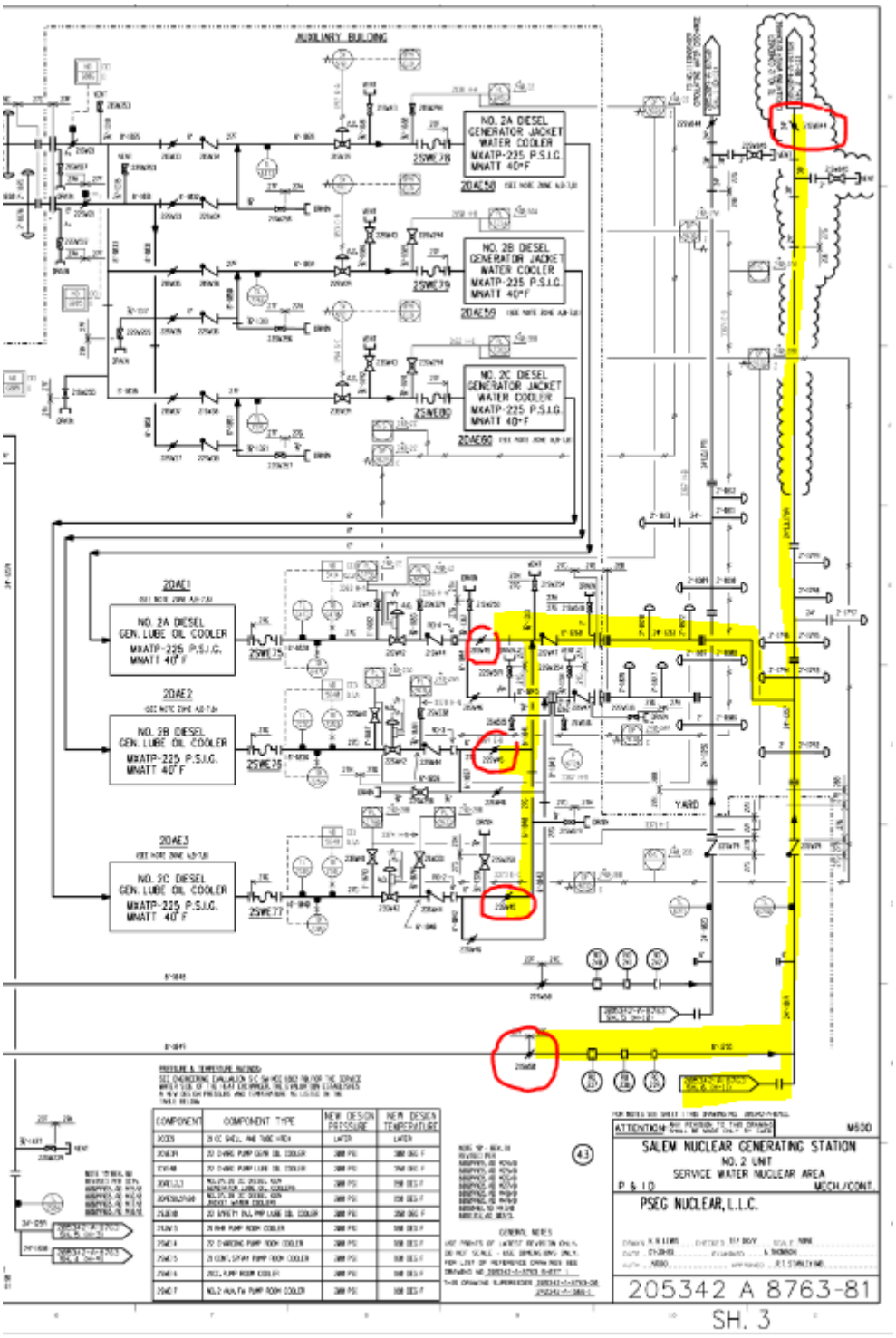
SYSTEM: **Generic Administrative Topic – Equipment Control**
TASK: **Identify Components to Isolate a Service Water System Leak Using Station Drawings**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	-	1. **Provide** copy of drawing 205342 Sheets 1 thru 7. 2. **Provide** two (2) highlighters with different colors			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
*		Mark up (or circle components) the provided P&ID drawings for the valves required to be closed.	**Using the P&IDs provided, the operator highlights or marks (e.g., circles valve) the minimum valves to isolate (close) the leak.** **<u>Evaluator's Note</u>: Operator only needs to highlight the valves on the provided P&ID.**		
*		List the components needed to be closed to isolate the leak:	**Operator identifies the following valves needed to be <u>closed</u>:** **21SW472 (sheet 3)** **21SW355 (sheet 3)** **21SW50 (sheet 3)** **21SW414 (sheet 5)** **21SW78 (sheet 6)** **22SW76 (sheet 6)** **21SW76 (sheet 6)** **22SW646 (sheet 6)** **21SW646 (sheet 6)**		

NAME:_____
DATE:_____

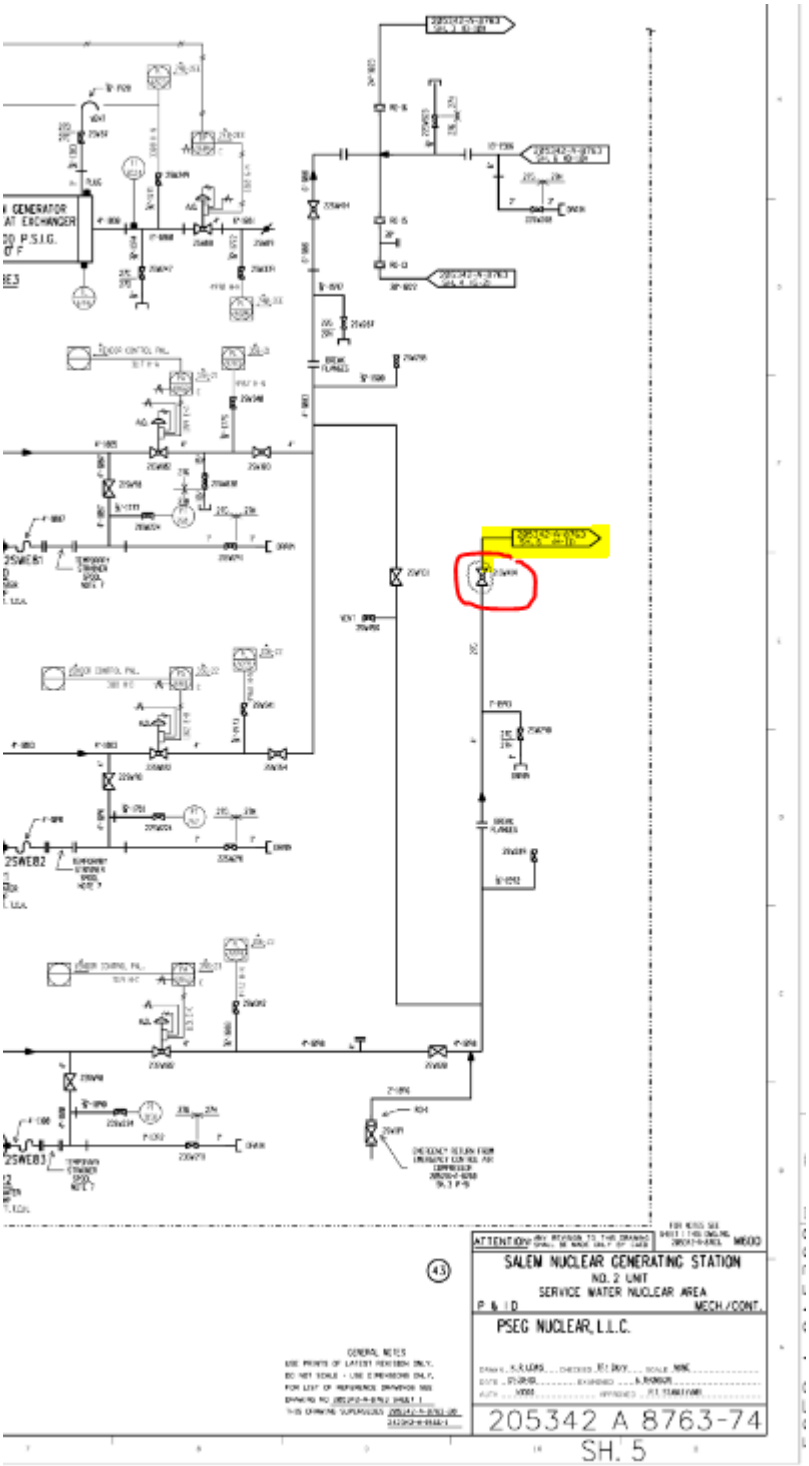
SYSTEM: **Generic Administrative Topic – Equipment Control**
TASK: **Identify Components to Isolate a Service Water System Leak Using Station Drawings**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator submits the Cue Sheet and P&ID drawings.**		



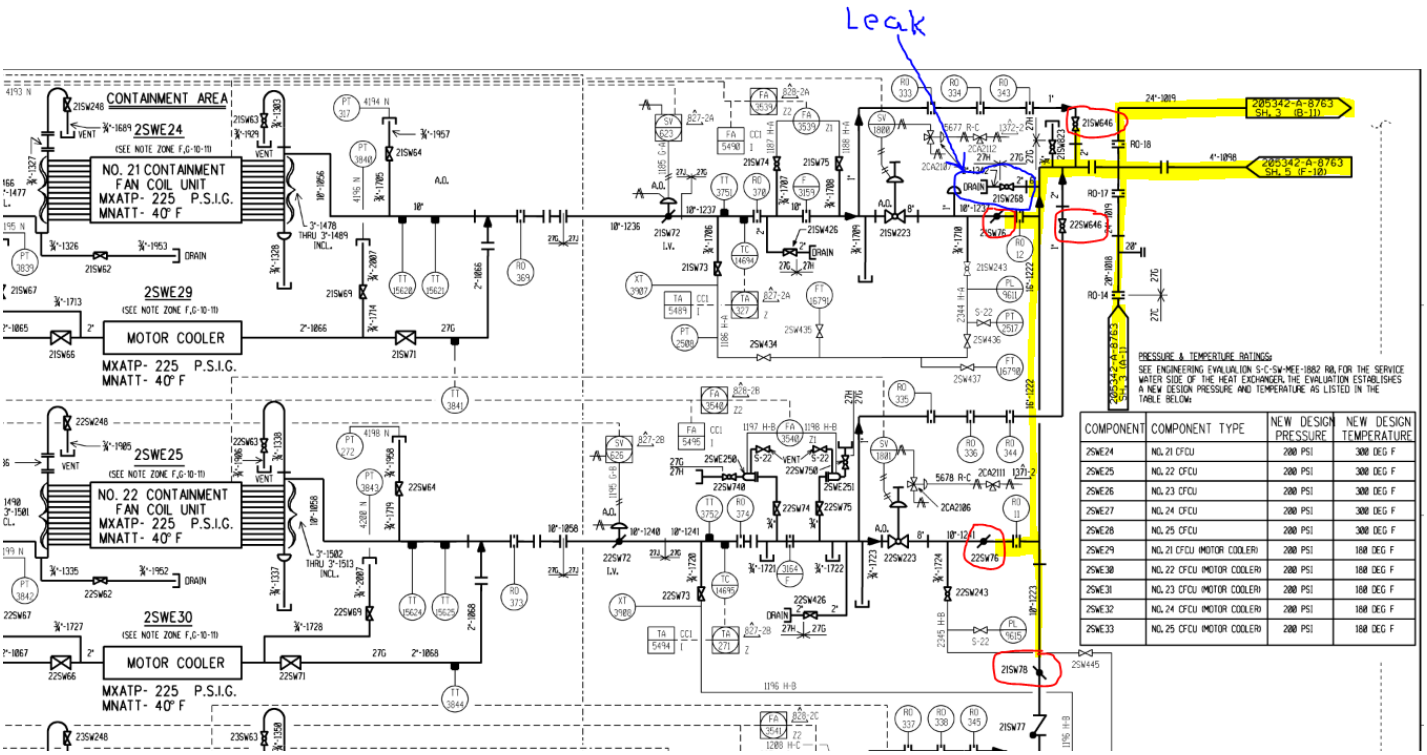
Valves on 205342 Sheet 3:

1. **21, 22, & 23SW45 (Note: optional)**
2. **21SW50**
3. **21SW844 (Note: Optional)**



Valve on 205342 Sheet 5:

1. **21SW414**



COMPONENT	COMPONENT TYPE	NEW DESIGN PRESSURE	NEW DESIGN TEMPERATURE
2SWE24	NO. 21 CFCU	200 PSI	300 DEG F
2SWE25	NO. 22 CFCU	200 PSI	300 DEG F
2SWE26	NO. 23 CFCU	200 PSI	300 DEG F
2SWE27	NO. 24 CFCU	200 PSI	300 DEG F
2SWE28	NO. 25 CFCU	200 PSI	300 DEG F
2SWE29	NO. 21 CFCU (MOTOR COOLER)	200 PSI	180 DEG F
2SWE30	NO. 22 CFCU (MOTOR COOLER)	200 PSI	180 DEG F
2SWE31	NO. 23 CFCU (MOTOR COOLER)	200 PSI	180 DEG F
2SWE32	NO. 24 CFCU (MOTOR COOLER)	200 PSI	180 DEG F
2SWE33	NO. 25 CFCU (MOTOR COOLER)	200 PSI	180 DEG F

Valves on 205342 Sheet 6:

1. **21 & 22SW76**
2. **21SW78**
3. **21 & 22SW646**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC RO-A3

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date _____

(205342 sheet 1 Rev 84, sheet 2 Rev 80, sheet 3 Rev 81, sheet 4 Rev 64, sheet 5 Rev 74, sheet 6 Rev 72, sheet 7 Rev 7)

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-15-20

SME/Instructor: J. Klein Date: 1-16-20

SME/Instructor: Z. Weidner Date: 1-16-20

INITIAL CONDITIONS:

INITIAL CONDITIONS:

- Unit 2 is in a Refueling outage with the reactor defueled.
- A Service Water leak has been identified by your field operator on a 2 inch drain valve (21SW268) near the 21SW76 valve inside the SW Valve Room, Auxiliary Building.
- The 21SW76 is a manual isolation valve for the SW outlet of 21 CFCU.
- The 21SW268, 21 NUC HDR FROM FCV DRAIN, is a 2 inch drain valve downstream of the 21SW76, 21 CFCU SW OUTLET VLV.
- The field operator reports that the leak is at the body to bonnet location of the valve.

INITIATING CUE:

- You are the Work Control NCO.
- The Work Control SRO directs you to identify the **minimum** number of components needed to isolate the leak.
- Drains and vents are NOT required to be identified at this point.
- A complete work clearance (tagout) with all required blocking points will be performed in accordance with station procedures after leak isolation.
- Assume check valves will function as designed with no leak-by.
- Mark up (or circle components) on the provided P&ID drawings for the valves required to be closed **and** document your list of valves on this Cue Sheet:

List valves here (valve description not required):

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Emergency Plan - Administrative

TASK: Activate ERDS During an ALERT IAW EP-SA-325-F8

TASK NUMBER: N1240110501

JPM NUMBER: 19-01 NRC RO-A4

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.4.43

IMPORTANCE FACTOR: 3.2 (RO) ____ (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [ ]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: EP-SA-325-F8, Rev 0 (checked 8-5-19)

TOOLS AND EQUIPMENT: "ERDS XXX" LAN Computer in Simulator

VALIDATED JPM COMPLETION TIME: 5 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 8-5-19**
Validated By:	**Kovalcsik** **SME or Instructor**	**Date: 6-17-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

JPM NUMBER: 19-01 NRC RO-A4

Rev #	Date	Description	Validation Required
00	10-11-17	New JPM. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	8-5-19	Editorial change to new procedure EP-AA-325-F8 now active due to Rev 6 changes to EALs.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Emergency Plan - Administrative

TASK: Activate ERDS During an ALERT IAW EP-SA-325-F8

TASK NUMBER: N1240110501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **PRIOR** to conducting this JPM; **CONTACT** the **NRC ERDS Test monitor** and **NOTIFY** ERDS being used for Training. (Day time: 301-287-9386, Night time: 240-888-2326, Day time cell: 301-731-2581, alternate number 301-873-6322, Erds.resource@nrc.gov)
- **OPEN** the ERDS program using the SPDS computer terminal in the back computer room. Single click the ERDS program using the mouse, this will now enable the computer in the simulator to connect ERDS to NRC using EP-SA-325-F8.
- Log onto the ERDS computer in simulator.
- **ENSURE** the "ERDS XXX" computer is available and working.

NAME: _____

DATE: _____

SYSTEM: Emergency Plan - Administrative

TASK: Activate ERDS During an ALERT IAW EP-SA-325-F8

TASK NUMBER: N1240110501

INITIAL CONDITIONS:

- Salem Unit 2 was manually tripped from 100% power due to an RCS leak.
- Safety Injection was manually initiated and all ECCS pumps are running
- The Shift Manager has declared an **ALERT.**

INITIATING CUE:

- You are the Work Control NCO and designated Secondary Communicator.
- **ACTIVATE** ERDS IAW Step 1.2.b of EP-SA-325-F8, Secondary Communicator Log.
- Notify the Shift Manager when ERDS is activated.

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. Activates ERDS by correctly performing steps 1.2.b.1 thru 1.2.b.6 IAW EP-SA-325-F8.

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Emergency Plan - Administrative

Task: Activate ERDS During an ALERT IAW EP-SA-325-F8

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**Simulator Operator:** • **NOTIFY NRC ERDS Test monitor** of pending Training evolution. • **OPEN** ERDS program on SPDS computer. • **LOG ON** to ERDS computer.			
	CUE	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	1.2.b	Within 60 minute, **ACTIVATE** ERDS from a **LAN computer**			
*	1.2.b.1	**PROCEED** to a computer with its monitor labeled "**ERDS XXX**" (XXX is the computer's asset tag number) in the Salem Control Room and **START** the program by **SELECTING** the **ERDS_Salem** desktop icon.	**Operator proceeds to ERDS XXX computer located inside Salem Simulator horseshoe area.** **Operator selects the ERDS_ Salem desktop icon.**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Emergency Plan - Administrative

Task: Activate ERDS During an ALERT IAW EP-SA-325-F8

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	1.2.b.2	On the "Login For ERDS Display" popup window **ENTER** the PASSWORD (Password is the same as the Username) and **SELECT** "Login" to proceed.	**Operator enters the PASSWORD and selects "Login" to proceed.**		
*	1.2.b.3	**SELECT** the Action button labeled **<CONNECT>** on the appropriate **Salem 1 or Salem 2** "ERDS Link Control and Status Display Screen".	**Operator selects the button labeled <CONNECT> for Salem 2 "ERDS Link Control and Status Display Screen".**		
*	1.2.b.4	**SELECT** the **<YES>** button in the "Current Link Control State is Disconnect. Do You Want To Connect?" box.	**Operator selects <YES> button in the "Current Link Control State is Disconnect. Do You Want To Connect?" box.**		
*	1.2.b.5	**OBSERVE** that Status changes to "Transmitting Data."	**Operator checks that the Status changes to "Transmitting Data"**		
*	1.2.b.6	**VERIFY** successful communications status by observing that the "Messages Sent" value is increasing from zero "0" to some positive integer > "0".	**Operator verifies that the "Message Sent" value is increasing from zero "0" to some positive integer > "0".**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Emergency Plan - Administrative

Task: Activate ERDS During an ALERT IAW EP-SA-325-F8

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	1.2.b.7	**INFORM** the CRS of successful ERDS activation status OR IF ERDS activation is not successful, THEN **CONTACT** IT Support: Network Operations (Ext. #7008), EOF IT Supervisor (NETS # 5009), or the IT Help Desk (Ext. 5555) for assistance.	**Terminate JPM when CRS/SM is notified ERDS is activated.**		
	CUE:	**JPM is Complete.** **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator notifies you that ERDS is activated.**		

System: Emergency Plan - Administrative

Task: Activate ERDS During an ALERT IAW EP-SA-325-F8

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		When all operators have completed this JPM, THEN: **<u>Simulator Operator</u>:** • **<u>NOTIFY</u> NRC ERDS Test monitor** of that Training evolution has ended. • **CLOSE** the ERDS program on the SPDS computer in back computer room.	**N/A**		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

JPM #: 19-01 NRC RO-A4

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __0___ Date ____8-5-19_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 8-5-19

SME/Instructor: D. Kovalcsik Date: 6-17-20

SME/Instructor:_____ Date: _____

INITIAL CONDITIONS:

- Salem Unit 2 was manually tripped from 100% power due to an RCS leak.
- Safety Injection was manually initiated and all ECCS pumps are running
- The Shift Manager has declared an **ALERT.**

INITIATING CUE:

- You are the Work Control NCO and designated Secondary Communicator.
- **ACTIVATE** ERDS IAW Step 1.2.b of EP-SA-111-F8, Secondary Communicator Log.
- Notify the Shift Manager when ERDS is activated.

1.2 **For an Alert or higher Emergency Classification Level:**

a. IF an on-shift SRO is not available to fill the OSC Operations Supervisor position, **CALLOUT** an additional SRO and have him/her report to the OSC.

Name: _____ Time: _____ NA CM2

NOTE

ERDS Activation and Termination is normally performed by the CM2 in the Control Room but if needed, could be performed by any communicator in the TSC or EOF by following the same directions below and substituting TSC or EOF for Control Room

CM2 CM2

b. Within 60 minutes, **ACTIVATE** ERDS from a **LAN computer:**

1. **PROCEED** to a computer with its monitor labeled "**ERDS XXX**" (XXX is the computer's asset tag number) in the Salem Control Room and **START** the program by **SELECTING** the **ERDS_Salem** desktop icon. _____ CM2
2. On the "Login For ERDS Display" popup window **ENTER** the PASSWORD (Password is the same as the Username) and **SELECT** "Login" to proceed. _____ CM2
3. **SELECT** the Action button labeled **<CONNECT>** on the appropriate **Salem 1 or Salem 2** "ERDS Link Control and Status Display Screen". _____ CM2
4. **SELECT** the **<YES>** button in the "Current Link Control State is Disconnect. Do You Want To Connect?" box. _____ CM2
5. **OBSERVE** that Status changes to "Transmitting Data." _____ CM2
6. **VERIFY** successful communications status by observing that the "Messages Sent" value is increasing from zero "0" to some positive integer > "0". _____ CM2
7. **INFORM** the CRS of successful ERDS activation status _____ CM2

OR

IF ERDS activation is not successful, THEN **CONTACT** IT Support: Network Operations (Ext. #7008), EOF IT Supervisor (NETS # 5009), or the IT Help Desk (Ext. 5555) for assistance. _____ CM2

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Admin - Conduct of Operations

TASK: Review Completed Shutdown Margin IAW SC.RE-ST.ZZ-0002

TASK NUMBER: N1200030301

JPM NUMBER: 19-01 NRC SRO-A1

ALTERNATE PATH: [ ] **K/A NUMBER:** 2.1.43

IMPORTANCE FACTOR: RO 4.3 SRO

APPLICABILITY:
EO [ ] **RO** [ ] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Classroom / Perform

REFERENCES: SC.RE-ST.ZZ-0002(Q), Rev. 24 SHUTDOWN MARGIN CALCULATION
S2.RE-RA.ZZ-0016(Q), Rev. 12 CURVE BOOK (both checked 4-7-20)

TOOLS AND EQUIPMENT: Calculator

VALIDATED JPM COMPLETION TIME: 30 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 4-7-20**
Validated By:	**Moore / Knock / Lantigua** **SME or Instructor**	**Date: 4-8-20 / 4-21-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Conduct of Operations

TASK: Calculate Shutdown Margin

TASK NUMBER: N1200030301

INITIAL CONDITIONS:

- Unit 2 load reduction in preparation for Main Turbine valve testing was placed on hold at 90% Power due to two Control Rods (1D4 and 1D2) stopped moving.
- Group Demand Counter for Control Bank D indicates 200 steps.
- The CRS has declared both Control Rods INOPERABLE and entered TS LCO 3.1.3.1 Action c.3.
- Current boron concentration is 1300 ppm.
- Current core burnup is 4000 EFPH.

Subsequently,

- Reactor Engineering informs you that both Control Rods are **UNTRIPPABLE**.
- The RO has completed a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.

INITIATING CUE:

Review the completed Shutdown Margin Calculation for completeness and accuracy.

1. Identify discrepancies, if any, and how to correct them on the CUE SHEET by recording the step number in error and what the correction should be OR you can MARK UP the provided procedure by one lining the error and record the correction.

2. Does the Shutdown Margin Calculation meet the surveillance requirement (Yes/No)? If no, briefly explain why?

List of Discrepancies (use this if NOT marking up procedure):

Step # in error	What is the correction?

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:

- **Candidate identifies the following errors in Attachment 3:**
  1. **Step 4.1.6 completed in error. Step 4.1.5 should be completed with a value of 2.**
  2. **Step 4.2.5 completed in error. Step 4.2.4 should be completed with a value of 4330 pcm.**
  3. **Step 4.2.7 completed in error. Trippable Rod Worth with Untrippable RCCA(s) should be used with a value of -2327.8 pcm (+/- 1 pcm)**
  4. **Step 4.3.1 should be the same value as calculated in step 4.2.7 of -2327.8 pcm**
  5. **Step 4.3.5 SDM should be -269.5 pcm (+/- 1 pcm)**
  6. **Step 4.4.1 marked incorrectly as SAT. With SDM of -269.5 pcm this step should be marked as UNSAT.**
  7. **Step 4.4.2.A marked incorrectly as N/A, should be 315.5 pcm (+/- 1 pcm)**
  8. **Step 4.4..2.B marked incorrectly as N/A, should be 19 % RTP (15 - 20 % RTP)**

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
		Obtains copy of procedure SC.RE-ST.ZZ-0002(Q). Obtains copy of S2.RE-RA.ZZ-0016 Curve Book.	Provide **Rev. 24** of surveillance. Provide **Rev. 12** of Curve Book.		
	CUE:	When the operator acknowledges ready to start JPM RECORD START TIME. **START:**_____			
*	4.1.6	# OF DROPPED OR MISALIGNED RCCA(s)	**Candidate determines step 4.1.6 is incorrectly filled out. This step should not be completed since both Control Rods were deemed untrippable.** **Candidate identifies that step 4.1.5 should have been completed with a value of:** **2 untrippable RCCA(s).**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
*	4.2.5	PENALTY FOR DROPPED OR MISALIGNED RCCA(s)	**Candidate determines that step 4.2.5 was not the correct step to complete based on rods being untrippable.** **Candidate determines that step 4.2.4 "PENALTY FOR UNTRIPPABLE RCCA(s)" should be used.** **Candidate performs step 4.2.4 and calculates a value of:** **4330 pcm.**		
	4.2.6	INTEGRAL ROD WORTH INSERTED AT POSITION IN ITEM 4.1.3	Candidate determines that Control Bank D demand is at 200 steps(from step 4.1.3) and looking at Table 1-7, the Integral Rod Worth at D-200 steps is **49.2 pcm**. **Examiner's Note**: IF Control Bank D demand was at 225 steps, this penalty would be 0 pcm.		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
*	4.2.7	CHOOSE the appropriate calculation below. MARK the calculation not used as "N/A".	**Candidate determines that the " TRIPPABLE ROD WORTH" calculation chosen was incorrect based on rods being untrippable.** **Candidate determines that the "TIPPABLE ROD WORTH WITH UNTRIPPABLE RCCA(s)" calculation should be used.** **Candidate determines the calculated TRIPPABLE ROD WORTH WITH UNTRIPABLE RCCA(s) is:** **-2327.8 pcm.**		
*	4.3.1	TRIPPABLE ROD WORTH	**Candidates corrects step to the same value as step 4.2.7:** **-2327.8 pcm**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
*	4.3.5 2.1	SDM	**Candidate determines that the calculated SDM 0f -2815.5 pcm is incorrect.** **Candidate calculates the SDM value to be:** **-269.5 pcm.**		
*	4.4.1	IS THE SDM EQUAL TO OR MORE NEGATIVE THAN (-) 1300 PCM?	**Candidate determines that this step was incorrectly marked as SAT.** **Candidate determines that the step is UNSAT.**		
	4.4.2	IF the SDM is UNSAT, THEN PERFORM the following:			
	4.4.2.A	**CALCULATE** the power defect required to achieve required SDM	Candidate performs calculation and determines required power defect is: **315.5 pcm**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **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)
	4.4.2.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)	Candidate refers to Figure 17A and determines Reactor Power Level of: **19 % RTP** **(acceptable band 15-20 % RTP)**		
	CUE	MARK stop time of JPM when procedures are returned to proctor. **STOP:**_____	JPM is Complete when Candidate submits Attachment to Evaluator.		

Table G Data Points for Curvebook Figure 15

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

Cycle Burnup (EFPH)	Control Bank Worth (pcm)		
	68 °F	350 °F	547 °F
0.0	3098	3448	3878
100.0	3098	3454	3886
1000.0	3002	3347	3777
2000.0	2896	3227	3657
3000.0	2840	3163	3594
4000.0	2823	3143	3576
5000.0	2809	3126	3562
6000.0	2822	3141	3580
7000.0	2835	3156	3598
8000.0	2859	3180	3627
9000.0	2887	3209	3661
10000.0	2916	3240	3697
11000.0	2950	3276	3739
12000.0	2985	3312	3782
12502.7	3002	3330	3803

Table H Data Points for Curvebook Figure 16

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

Cycle Burnup (EFPH)	Shutdown Bank Worth (pcm)		
	68 °F	350 °F	547 °F
0.0	2258	2394	2552
100.0	2250	2378	2541
1000.0	2425	2546	2703
2000.0	2618	2732	2883
3000.0	2776	2880	3023
4000.0	2906	2999	3131
5000.0	3033	3115	3235
6000.0	3139	3205	3313
7000.0	3245	3295	3391
8000.0	3340	3375	3458
9000.0	3429	3451	3521
10000.0	3516	3524	3581
11000.0	3593	3589	3633
12000.0	3671	3654	3686
12502.7	3710	3686	3712

Table 1-6

Summary of Control Rod Worths

HZP, No Xe

Burnup (EFPH)		Control Banks (pcm)	Shutdown Banks (pcm)	Control and Shutdown Banks (pcm)
BOL	0.0	3877.5	2552.4	6429.9
MRDS	2439.6	3603.8	2961.7	6565.5
MOL	6098.9	3575.4	3325.8	6901.2
LFPC	11381.8	3753.3	3654.6	7407.9

Rod Worth Penalty to Use for Modes 1, 2

Event A	Rod Worth Penalty (pcm) BOL to < MOL (6098.9 EFPH)	Rod Worth Penalty (pcm) MOL (6098.9 EFPH) to EOL
One Untrippable RCCA	2005	2165

Event B	Rod Worth Penalty (pcm) BOL to EOL
Two or more Untrippable RCCAs	2165

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

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

Table 1-7 (Continued)

Data Points for Curvebook Figures 2 and 2C
MRDS HFP Differential and Integral Rod Worth vs. RCCA Steps Withdrawn
Burnup = 2439.6 EFPH, Range = 1265.6 - 4269.3 EFPH, 128 Step Separation, Eq Xe

Steps Withdrawn				Differential	Integral
Total Steps	D	C	B	Rod Worth (pcm/step)	Rod Worth (pcm)
609	225	225	225	0.5	0.0
604	220	225	225	0.9	2.6
594	210	225	225	2.4	20.4
584	200	225	225	3.0	49.2
574	190	225	225	4.0	85.2
564	180	225	225	4.4	126.4
554	170	225	225	4.6	171.9
544	160	225	225	4.9	217.1
534	150	225	225	4.9	266.1
524	140	225	225	5.1	315.8
514	130	225	225	5.2	364.8
504	120	225	225	5.2	416.4
494	110	225	225	5.1	467.5
482	98	225	225	5.1	528.6
474	90	218	225	6.6	575.4
464	80	208	225	8.1	649.7
454	70	198	225	8.8	733.7
444	60	188	225	9.8	826.5
434	50	178	225	10.3	927.2
424	40	168	225	10.3	1031.7
414	30	158	225	10.5	1134.6
404	20	148	225	9.9	1237.6
394	10	138	225	9.0	1333.4
384	0	128	225	7.4	1415.0

Table 2-1 (Continued)

Data Points for Curvebook Figure 17A
MRDS Total Power Defect (pcm) as a Function of Power and Boron Concentration
Burnup = 2439.6 EFPH, Range = 1265.6 - 4269.3 EFPH

Power Level (%)	Boron Concentration (ppm)															
	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76
10	179	177	175	173	171	169	167	165	163	161	159	157	155	154	152	150
15	265	262	259	256	253	250	247	244	241	238	235	232	229	227	224	221
20	348	344	340	336	332	328	324	320	316	312	308	305	301	297	294	290
25	430	425	420	415	409	404	399	395	390	385	380	376	371	366	362	357
30	511	504	498	492	486	479	473	468	462	456	450	445	439	434	428	423
35	590	583	575	568	560	553	546	539	533	526	519	513	506	500	493	487
40	668	660	651	643	634	626	618	610	602	595	587	580	572	565	557	550
45	746	736	727	717	708	698	689	680	671	663	654	646	637	629	621	612
50	824	813	802	791	781	770	760	750	740	730	721	711	702	692	683	674
55	901	889	877	865	853	842	830	819	808	797	787	776	766	755	745	735
60	978	965	952	939	926	913	900	888	876	864	852	841	829	818	807	796
65	1056	1041	1027	1012	998	984	971	957	944	931	918	905	893	881	868	856
70	1134	1118	1102	1086	1071	1056	1041	1026	1012	998	984	970	957	943	930	917
75	1212	1195	1178	1161	1144	1128	1112	1096	1080	1065	1050	1035	1020	1006	991	977
80	1291	1272	1254	1236	1218	1200	1183	1166	1149	1132	1116	1100	1084	1068	1053	1038
83	1338	1319	1300	1281	1262	1244	1225	1208	1190	1173	1156	1139	1123	1106	1090	1074
85	1370	1350	1330	1311	1292	1273	1254	1236	1218	1200	1182	1165	1148	1131	1115	1098
90	1450	1429	1408	1387	1366	1346	1326	1306	1287	1268	1249	1231	1213	1195	1177	1159
95	1531	1508	1486	1463	1441	1420	1398	1377	1357	1336	1316	1297	1277	1258	1239	1221
99	1596	1572	1548	1525	1502	1479	1456	1434	1413	1391	1370	1350	1329	1309	1289	1270
100	1613	1588	1564	1540	1517	1494	1471	1449	1427	1405	1384	1363	1342	1322	1302	1282

ANSWER KEY

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2
Page 1 of 4

SALEM UNIT 2

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.

1.5 To determine shutdown margin with a bank inserted beyond insertion limit specified in the COLR in accordance with T/S 3.1.3.4 and T/S 3.1.3.5.

2.0 **PREREQUISITES**

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

3.0 **PRECAUTIONS AND LIMITATIONS**

R 3.1 All figures are located in S1(2).RE-RA.ZZ-0016(Q) Curvebook.

R 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.

R 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.

R 3.4 The term "abs" found in some formulas refers to the absolute value of the item in question.

R 3.5 Inoperable RCCAs are further classified as untrippable, dropped or misaligned.

4.0 **PROCEDURE**

4.1 **CRITICAL CONDITIONS**

4.1.1 POWER LEVEL 90 %RTP

4.1.2 BORON CONCENTRATION 1300 ppm

ANSWER KEY

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2

SALEM UNIT 2

4.1.3 BANK POSITION

CONTROL BANKS:	SHUTDOWN BANKS
BANK A at 225 STEPS	BANK A at 225 STEPS
BANK B at 225 STEPS	BANK B at 225 STEPS
BANK C at 225 STEPS	BANK C at 225 STEPS
BANK D at 200 STEPS	BANK D at 225 STEPS

4.1.4 BURNUP 4000 EFPH

4.1.5 # OF UNTRIPPABLE RCCA(s) 2 ~~0~~ RCCA(s)

4.1.6 # OF DROPPED OR MISALIGNED RCCA(s) 0 ~~2~~ RCCA(s)

4.2 **CALCULATION OF ROD WORTH**

4.2.1 TOTAL CONTROL BANK WORTH (Figure 15/Table G) (-) 3576 pcm

4.2.2 TOTAL SHUTDOWN BANK WORTH (Figure 16/Table H) (-) 3131 pcm

4.2.3 MOST REACTIVE STUCK ROD WORTH (Figure 14/Table I) 784 pcm

NOTE
The reactivity worth for a single or multiple untrippable RCCAs and dropped or misaligned RCCAs comes from Table 1-6 S1(2).RE-RA.ZZ-0016, Curve Book. For multiple untrippable RCCAs, the penalty in 4.2.4 should have a maximum value of the sum of the total shutdown and control bank worths in steps 4.2.1 and 4.2.2.

4.2.4 PENALTY FOR UNTRIPPABLE RCCA(s) 4330 ~~0~~ pcm
_____ (Item 4.1.5) x _____ (Table 1-6) =

4.2.5 PENALTY FOR DROPPED OR MISALIGNED RCCA(s) 0 ~~1000~~ pcm
_____ (Item 4.1.6) x _____ (Table 1-6) =

ANSWER KEY

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2

SALEM UNIT 2

NOTE
If control bank B or C is inserted ≤ 10 steps beyond the rod insertion limit, the value in step 4.2.6 should be the integral rod worth from Table 1-8 at the violating bank's current position. This is a conservative estimate of the rod worth of any violation allowed in T.S. 3.1.3.5 Action 1.

CAUTION
Shutdown margin may only be calculated with 1 shutdown bank or control bank A, B, or C inserted beyond the RIL.

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) 49.2 pcm

4.2.6.a **IF** any shutdown bank or control bank A is inserted ≤ 10 steps, record 50 pcm; otherwise record 0 pcm. 0 pcm

4.2.6.b INTEGRAL ROD WORTH and Penalty (Item 4.2.6) + (Item 4.2.6.a) = 49.2 pcm

NOTE
The penalties for untrippable RCCAs include the most reactive stuck rod worth. The most reactive stuck rod worth from step 4.2.3 is not needed when calculating the trippable rod worth with at least one untrippable RCCA.

4.2.7 **CHOOSE** the appropriate calculation below. **MARK** the calculation not used "N/A."

TRIPPABLE ROD WORTH. ~~-4873.8~~ pcm N/A
(Item 4.2.1) + (Item 4.2.2) + (Item 4.2.3) + (Item 4.2.5) + (Item 4.2.6.b) =

OR -2327.8

TRIPPABLE ROD WORTH WITH UNTRIPPABLE RCCA(s) ~~N/A~~ pcm
(Item 4.2.1) + (Item 4.2.2) + (Item 4.2.4) + (Item 4.2.5) + (Item 4.2.6.b) =

4.3 **CALCULATION OF SDM (Note: See Precaution 3.4)** -2327.8

4.3.1 TRIPPABLE ROD WORTH (Item 4.2.7) ~~-4873.8~~ pcm

4.3.2 TEN PERCENT ROD WORTH PENALTY (+) 592.3 pcm
(_____ + _____ - _____) x 0.10 =
abs(Item 4.2.1) abs(Item 4.2.2) (Item 4.2.3)

4.3.3 ROD MISALIGNMENT RELAXATION PENALTY (+) 120 pcm

4.3.4 POWER DEFECT (Figure 17A/Table 2-1) 1346 pcm

4.3.5 SDM ~~-2815.5~~ pcm
(Item 4.3.1) + (Item 4.3.2) + (Item 4.3.3) + (Item 4.3.4)= -269.5

ANSWER KEY

ATTACHMENT 3
SHUTDOWN MARGIN VERIFICATION
FOR MODES 1 OR 2

SALEM UNIT 2

4.4 **ACCEPTANCE CRITERIA**

> **NOTE**
> REQUIRED SDM (per T/S 3.1.1.1) MODE 1 OR 2:
> (-)1.3 % Δk/k = (-)1300 PCM

R / $ 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: ✓

> **NOTE**
> If the required power defect in step 4.4.2.A is negative, then it is not possible to meet SDM by lowering reactor power and step 4.4.2.B will be 0%.

R ~~NA~~ 4.4.2 IF the SDM is UNSAT, THEN **PERFORM** the following:

R ~~NA~~ A. **CALCULATE** the power defect required to achieve required SDM.

2327.8 (abs(Item 4.3.1)) - 592.3 (Item 4.3.2) - 120 pcm (Item 4.3.3) - 1300 pcm = 315.5 pcm

R ~~NA~~ 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)

19 %RTP

R ~~NA~~ C. **NOTIFY** SM/CRS to initiate rapid boration, IAW S1(2).OP-SO.CVC-0008(Q), Rapid Boration, and reduce reactor power UNTIL the required SDM is attained.

Completed by: R. Chan Date: Today Time: Now

Reviewed by: D. Bell Date: Today Time: Now

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __24___ Date ____4-7-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 4-7-20

SME/Instructor: R. Moore Date: 4-8-20

SME/Instructor: L. Knock Date: 4-21-20

INITIAL CONDITIONS:

- Unit 2 load reduction in preparation for Main Turbine valve testing was placed on hold at 90% Power due to two Control Rods (1D4 and 1D2) stopped moving.
- Group Demand Counter for Control Bank D indicates 200 steps.
- The CRS has declared both Control Rods INOPERABLE and entered TS LCO 3.1.3.1 Action c.3.
- Current boron concentration is 1300 ppm.
- Current core burnup is 4000 EFPH.

Subsequently,

- Reactor Engineering informs you that both Control Rods are **UNTRIPPABLE**.
- The RO has completed a Shutdown Margin Calculation IAW SC.RE-ST.ZZ-0002 to satisfy the action requirement of TSAS 3.1.3.1 Action c.3.

INITIATING CUE:

Review the completed Shutdown Margin Calculation for completeness and accuracy.

1. Identify discrepancies, if any, and how to correct them on the CUE SHEET by recording the step number in error and what the correction should be **OR** you can MARK UP the provided procedure by one lining the error and record the correction.

2. Does the Shutdown Margin Calculation meet the surveillance requirement (Yes/No)? If no, briefly explain why?

List of Discrepancies (use this if NOT marking up procedure):

Step # in error	What is the correction?

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative Topic - Conduct of Operations

TASK: Evaluate Shift Staffing Requirements and Take Corrective Actions IAW Administrative Procedures

TASK NUMBER: N1230040302

JPM NUMBER: 19-01 NRC SRO-A2

ALTERNATE PATH: [ ] **K/A NUMBER:** 2.1.5

IMPORTANCE FACTOR: RO: ____ SRO: 3.9

APPLICABILITY:
EO [ ] **RO** [ ] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Classroom / Perform

REFERENCES: LS-AA-119-1003 , Rev 8 & SY-AA-102-201, Rev 11 (checked 1-16-20)
LS-AA-119, Rev 12

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 45 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: NA

Developed By: **R. Chan** **Date: 1-16-20**
Instructor

Validated By: **Moore / Chapman** **Date: 1-16-20 / 6-17-20**
SME or Instructor

Approved By: **N/A** **Date:**
Training Department

Approved By: **N/A** **Date:**
Operations Department

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Generic Administrative Topic - Conduct of Operations

TASK: Evaluate Shift Staffing Requirements and Take Corrective Actions IAW Administrative Procedures

TASK NUMBER: N1230040302

INITIAL CONDITIONS:

- Today is Thursday October 17, 2020.
- Both Units are at 100% power.
- You are the Shift Manager and your crew has just begun its 12 hour night shift starting at 1800 hours.

- The crew is at minimum staffing levels.
- At 1830 hours, the Plant Operator on Unit 2 has become ill and has been sent home, which places the shift **BELOW** MINIMUM staffing levels.
- There are **NO** qualified operators available on-site.
- Four (4) operators have been contacted at home.
- This call-out is **NOT** for an emergency.

INITIATING CUE:

- Based on Administrative requirements, determine the following from the given list of available operators and work schedules:

    1. How soon must relief be found?

    2. From the list provided, who is eligible to assume the shift duties. Assume the following:

        - For hours worked, the Operator starts at 1800 on October 17th.

        - Operator works the remaining hours of the shift AND they work the schedule provided in this JPM

    3. For those who are NOT eligible, state the reason why?

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 <u>two (2) hours</u> to restore shift crew to minimum staffing levels.**
2. **Determines Operator #1 can be called in.**
3. **States why operators are not eligible to assume the shift:**
   a. **Operator #2 is not fit for duty IAW SY-AA-102-201 due to consuming alcohol during the past five hours,**
   b. **Operator #3 will violate LS-AA-119-1003 work hour rule (> 16 hours in a 24-hour period) and/or break period (less than 10 hour break), and**
   c. **Operator #4 is not fit for duty IAW SY-AA-102-201 due to use of medication affecting his/her ability to perform work.**

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OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topic - Conduct of Operations

Task: Evaluate Shift Staffing Requirements and Take Corrective Actions IAW Administrative Procedures

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**Provide** copies or make available the following procedures: 1. LS-AA-119 2. LS-AA-119-1003 3. SY-AA-102-201 4. Salem Technical Specification			
	CUE:	When the operator acknowledges ready to start JPM RECORD START TIME. **START:**_____			
*	1	How soon must relief be found?	**Determines IAW Technical Specification Administrative section that two (2) hours to restore shift staffing to minimum levels.**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topic - Conduct of Operations

Task: Evaluate Shift Staffing Requirements and Take Corrective Actions IAW Administrative Procedures

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	2	From the list provided, who is eligible to assume the shift duties. Assume the following: ▪ For hours worked, the Operator starts at 1800 on October 17th. ▪ Operator works the remaining hours of the shift AND they work the schedule provided in this JPM	**Determines that Operator #1 is eligible to be called in without violating the work hour rules and fitness for duty program requirements.**		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topic - Conduct of Operations

Task: Evaluate Shift Staffing Requirements and Take Corrective Actions IAW Administrative Procedures

*	STEP NO.	STEP (* Denotes a Critical Step)	STANDARD	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	3	For those who are NOT eligible, state the reason why?	**Operator #2 is not fit for duty IAW SY-AA-102-201 due to consuming alcohol during the past five hours,** **Operator #3 will violate LS-AA-119-1003 work hour rule (> 16 hours in a 24-hour period) and/or break period (less than 10 hour break), and** **Operator #4 is not fit for duty IAW SY-AA-102-201 due to use of medication affecting his/her ability to perform work.** **JPM is Complete when candidate submits cue sheet.**		
	CUE	MARK stop time of JPM when procedures are returned to proctor. **STOP:**_____	JPM is Complete when operator submits Attachment to Evaluator.		

ANSWER KEY

LS-AA-119-1003

4.1 Work Hour Limits

NOTE

Refer to OP-AA-108-111-1001, "Severe Weather and Natural Disaster Guidelines and SY-AA-101-109-1003, "Security During Hazardous Exterior Conditions", for guidance requirements concerning entry and exit conditions, and limitations for the exemption from the requirements 10 CFR 26.205(c) and (d) for meeting work hour rule controls during certain declarations of severe weather conditions involving tropical storm or hurricane force winds or severe winter precipitation.

4.1.1. The following limits apply to covered individuals regardless of unit status:

- No more than 16 work hours in any 24-hour period.
- No more than 26 work hours in any 48-hour period.
- No more than 72 work hours in any 7-day period.

NOTE

EmpCenter conservatively uses 168 hours vs. 7-calendar days for this calculation and may produce deviations that may be overridden following verification that the 7-calendar day limit has not been exceeded.

- At least a 10-hour break between successive work periods or an 8-hour break when a break of less than 10 hours is necessary to accommodate a crew's scheduled transition between work schedules or shifts.
- A 34-hour break in any 9-calendar day period (this limit may be incorporated into the following table of limits).

ANSWER KEY

ANSWER KEY

2. **IF** the call-in is not preceded or succeeded by a 10-hour break,

   THEN it is considered an extension to the preceding or succeeding work period and the intervening hours of the extended work period must be counted.

   a. Example 1: An individual that normally works 0700 to 1500 (8-hour day) is called back to work at 1900 and works until 2100.

      - The separate work period method cannot be used, as a 10-hour break is not available prior to the call-in period.

      - The call-in is considered an extension of the previous work period, 0700 to 1500. The hours counted for this work period would be from 0700 to 2100 (14 hours). A ten-hour break is required prior to the individual starting an additional work period; therefore, the individual could return at the normal start of their work period at 0700 the next day.

ANSWER KEY

ANSWER KEY

Attachment 1, Examples

1. John Doe normally works a 12-hour shift schedule. He is requested to perform covered work for additional hours from 0700 to 1900 on Friday. What needs to be considered prior to working those additional hours?

   1.1. The following five items need to be considered:

      1.1.1. Review all hours worked during the 24-hour period prior to the stop time on Friday as reflected in the request to work additional hours to ensure no more than 16 hours in any 24-hour period will be worked.

      1.1.2. Review all hours worked during the 48-hour period prior to the stop time on Friday as reflected in the request to work additional hours to ensure no more than 26 hours in any 48-hour period will be worked.

      1.1.3. Review all hours worked during the 7-day period prior to the stop time on Friday (i.e., T-168 hours) as reflected in the request to work additional hours to ensure no more than 72 hours in any 7-day period will be worked.

      1.1.4. Review the break period(s) between the last day of work before Friday and 0700 on Friday to ensure a 10-hour break has been taken.

      1.1.5. Review the break period(s) during the last nine days prior to the stop time on Friday to ensure a break of at least 34 consecutive hours has been taken.

ANSWER KEY

4.2 Call out Procedure

NOTE
If the caller does not ask the individual if alcohol was consumed within the five hour period prior to reporting to work and does not ask the individual if they are fit for duty, then the person being called is responsible to inform the caller of this information. If consumption of alcohol and/or the individual is not fit for duty is disclosed using an automated call-out system for activation of the TSC and OSC, then the automated call-out system directs the individual not to report and the next person on the list is contacted

4.2.1. Prior to Call-out, **DETERMINE** whether work to be performed is an emergency.

4.2.2. Prior to Call-out; **PERFORM** a fatigue work hour evaluation to determine if any limits will be exceeded IAW LS-AA-119.

4.2.3. **PERFORM** Call-out of PSEG, contractor and vendor employees **and** **DOCUMENT** the following on Attachment 1 of this procedure or a comparable form:

a. **ASK** "Have you consumed alcohol during the past five hours?" RECORD answer on Attachment 1.

b. **ASK** "Do you consider yourself fit for duty?" RECORD answer on Attachment 1.

4.2.4. **If** the called employee has **not** consumed alcohol during the past five hours **and** has responded YES to "Do you consider yourself fit for duty?", then **INSTRUCT** worker to report to work normally.

4.2.5. **If** the called employee has consumed alcohol during the past five hours **and** has responded YES to "Do you consider yourself fit for duty?" **then** **PERFORM** the following:

a. **INSTRUCT** worker to report to security for Breath Alcohol Testing upon arrival at job site.

ANSWER KEY

b. **NOTIFY** Security Shift Manager to implement the Unscheduled Call-out Alcohol Testing per procedure SY-AA-102-242, Breath Alcohol Testing.

4.2.6. **If** the called employee has consumed alcohol during the past five hours **and** has responded NO to "Do you consider yourself fit for duty?", **THEN INSTRUCT** worker **not** to report for work.

4.2.7. **If** the called employee has **not** consumed alcohol during the past five hours **and** has responded NO to "Do you consider yourself fit for duty?", **then PERFORM** the following:

a. **If** Call-out is for an emergency, Supervisor responsible for the emergency work **DISCUSS** conditions with called employee. **If**, in the judgment of the supervisor, called worker is needed, **then**:

(1) **INSTRUCT** worker to report, in a safe manner, to security upon arrival to job site.

(2) **NOTIFY** Security Shift Manager to **ENSURE** that the called out worker's unescorted access is **not** available until an FFD evaluation is performed.

(3) **NOTIFY** supervisor responsible for the emergency work that the individual may perform the emergency work, if necessary, at the supervisor's discretion, but may require escort and continuous direct supervision.

(4) Supervisor responsible for the emergency work **EVALUATE** called employee upon arrival and **DOCUMENT** on Attachment 2.

If, in the judgment of the supervisor, called worker is **not** needed, **then**: **INSTRUCT** worker **not** to report for work.

b. **If** Call-out is **not** for an emergency, **then INSTRUCT** worker **not** to report for work.

ANSWER KEY

Salem Technical Specification

TABLE 6.2-1

MINIMUM SHIFT CREW COMPOSITION

SALEM UNIT 2

WITH UNIT 1 IN MODES 5 OR 6 OR DE-FUELED		
POSITION	NUMBER OF INDIVIDUALS REQUIRED TO FILL POSITION	
	MODES 1, 2, 3 & 4	MODES 5 & 6
SNSS	1[a]	1[a]
SRO	1[b]	none
STA	1[b]	none
NCO	2	1
EO/UO	3	2[c]
Maintenance Electrician	1	none
Rad. Pro. Technician	1[a]	1[a,e]

WITH UNIT 1 IN MODES 1, 2, 3 OR 4		
POSITION	NUMBER OF INDIVIDUALS REQUIRED TO FILL POSITION	
	MODES 1, 2, 3 & 4	MODES 5 & 6
SNSS	1[a]	1[a]
SRO	1[b]	none
STA	1[b]	none
NCO	2	1
EO/UO	3[d]	1
Maintenance Electrician	1[a]	none
Rad. Pro. Technician	1[a]	1[a]

a/ Individual may fill the same position on Unit 1.

b/ Individual who fulfills the STA requirement may fill the same position on Unit 1. The STA, if a licensed SRO, may concurrently fill the SRO position on one unit; the other unit also requires a qualified SRO on shift.

c/ One of the two required individuals may fill the position on Unit 1, such that there are a total of three EO/UO's for both units.

d/ One of the three required individuals may fill the same position of Unit 1, such that there are a total of five EO/UO's for both units.

e/ Not needed if both reactors are de-fueled.

SALEM - UNIT 2 6-5 Amendment No. 112

ANSWER KEY

ANSWER KEY

TABLE 6.2-1 (Continued)

SNSS - Senior Nuclear Shift Supervisor with a Senior Reactor Operator License on both units.

SRO - Individual with a Senior Reactor Operator License on both units (normally, a Nuclear Shift Supervisor).

NCO - Nuclear Control Operator with a Reactor Operator License on both units.

STA - Shift Technical Advisor (if licensed as SRO, may be assigned duties as a Nuclear Shift Supervisor).

EO/UO - Equipment Operator or Utility Operator.

Except for the Senior Nuclear Shift Supervisor, the Shift Crew Composition may be one less than the minimum requirements of Table 6.2-1 for a period of time not to exceed 2 hours in order to accommodate the unexpected absence of on-duty shift crew members provided that immediate action is taken to restore the Shift Crew Composition to within the minimum requirements of Table 6.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewperson's being late or absent.

During any absence of the Senior Nuclear Shift Supervisor from the Control Room area while the unit is in any MODE, an individual with a valid SRO License shall be designated to assume the Control Room command function.

ANSWER KEY

ANSWER KEY

Operator	Thurs 10/10	Fri 10/11	Sat 10/12	Sun 10/13	Mon 10/14	Tues 10/15	Wed 10/16	Thurs 10/17	Fri 10/18	Sat 10/19	Sun 10/20	Mon 10/21	Tues 10/22	Wed 10/23	Thurs 10/24
#1	D	D						(6)	N (12)	N (12)	N (12)	N (12)	N (6)		
#2		D	D	D				(6)	N (12)	N (12)	N (12)	N (12)	N (6)		
#3	T	T			T (10)	T (10)	T (10)	T (10+6)	N (6)			D	D	D	
#4					(6)	N (12)	N (12)	N (12)	N (6)			N	N	N	

Operator	Eligible to Assume the Shift?	Evaluation for Eligibility / Reason if Not Eligible
#1	YES	Operator #1 works the schedule and finishes his/her shift on 10/22 the total hours worked would be 60 hours. Therefore, operator #1 would not violate any of LS-AA-119-1003 work hour rules and required rest periods.
#2	NO	Operator #2 works the schedule and finishes his/her shift on 10/22 the total hours worked would be 60 hours. Operator #2 would not violate any of LS-AA-119-1003 work hour rules and required rest periods. However, Operator #2 self-reported on the phone call that he/she consumed alcohol during the last five hours and believes to be not fit for duty. This operator should not be called in.
#3	NO	If Operator #3 works the night shift, he/she would have worked 22 hours in a 24-hour period and violate LS-AA-119-1003 in two areas; (1) no more than 16 work hours in any 24-hour period, and (2) at least a 10-hour break between successive work periods..). This operator should not be called in. Examiner's Note: Call-In time NOT included (this would add additional 1 hr)
#4	NO	If Operator #4 works the schedule and finishes his/her shift on 10/18 the total hours worked would be 48 hours. Operator #4 would not violate any of LS-AA-119-1003 work hour rules and required rest periods. However, Operator #4 self-reported on the phone call that he/she took medication that can cause impairment and believes to be not fit for duty. This operator should not be called in.

ANSWER KEY

ANSWER KEY

	Fatigue Work Hour Evaluation (LS-AA-119-1003)					Fitness for Duty (SY-AA-102-201)
Operator	**Worked > 16 hours in 24-hour period**	**Worked >26 hours in a 48-hour period**	**Worked > 72 hours in a rolling 7 day period**	**At least 10-hour break between successive work periods**	**At least 34-hour break during the last nine day period**	**Fit for Duty?**
1	NO	NO	NO	YES	Yes	YES
2	NO	NO	NO	YES	Yes	**NO Consumed alcohol within the last 5 hours**
3	**YES**	NO	NO	**NO**	Yes	YES
4	NO	NO	NO	YES	Yes	**NO Used medication that may impair operator performance. Stated not fit for duty.**

ANSWER KEY

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. _____ Date (see cover page)

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

RC 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

RC 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-16-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	M. Chapman	Date:	6-17-20

INITIAL CONDITIONS:

- Today is **Thursday October 17, 2020**.
- Both Units are at 100% power.
- You are the Shift Manager and your crew has just begun its 12 hour night shift starting at 1800 hours.
- The crew is at minimum staffing levels.
- At 1830 hours, the Plant Operator on Unit 2 has become ill and has been sent home, which places the shift **BELOW** MINIMUM staffing levels.
- There are **NO** qualified operators available on-site.
- Four (4) operators have been contacted at home.
- This call-out is **NOT** for an emergency.

INITIATING CUE:

- Based on Administrative requirements, determine the following from the given list of available operators and work schedules:

    1. How soon must relief be found?

    2. From the list provided, who is eligible to assume the shift duties. Assume the following:

        - For hours worked, the Operator starts at 1800 on October 17th.

        - Operator works the remaining hours of the shift AND they work the schedule provided in this JPM

    3. For those who are NOT eligible, state the reason why?

Operator Response to Call-In phone call:

Operator	Call-Out Phone Responses
1	"I would rather not work tonight, my son has a baseball game, but if you guys are in a jam I can be there in 45 minutes. I have not consumed alcohol during the past five hours and I am fit for duty."
2	"I'm home right now with some friends visiting from out of town. I've had a couple of beers with the guys. I can come in if you want me to. I can be there in 50 minutes. I have consumed alcohol during the past five hours and I don't really think I'm fit for duty."
3	"I just got home from training at 1730. This was my last day of training and don't take the watch until Monday day shift. I live nearby and can be there in 30 minutes. I have not consumed alcohol during the past five hours and I am fit for duty."
4	"I just finished working nights on Thursday morning. I think a caught a cold from one of the operators. I'm fighting a really nasty cold and just took a dose of Nyquil Liquid Nighttime Cold Medicine an hour ago so I could get some rest. I know I don't want to infect the other guys on shift, but I know the situation you're in and willing to help out. I could take a hot shower to help wake me up and I could be there in an hour. I have not consumed alcohol during the past five hours and I'm not sure if I'm fit for duty but willing to come in."

Operators Schedule:

Operator	Thurs 10/10	Fri 10/11	Sat 10/12	Sun 10/13	Mon 10/14	Tues 10/15	Wed 10/16	Thurs 10/17	Fri 10/18	Sat 10/19	Sun 10/20	Mon 10/21	Tues 10/22	Wed 10/23	Thurs 10/24
#1	D	D								N	N	N	N		
#2		D	D	D						N	N	N	N		
#3	T	T			T	T	T	T				D	D	D	
#4						N	N	N				N	N	N	

Notes:

N = Night Shift that starts on the previous day at 1800 hours and ends at 0600 hours the next day
D = Day Shift that starts at 0600 hours and ends at 1800 hours
T = Training that starts at 0700 hours and ends at 1700 hours
BLANK SPACE = Scheduled day off

Operator	Eligible to Assume Watch (Yes / No)	State Reason if not eligible
#1		
#2		
#3		
#4		

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative Topics – Equipment Control

TASK: Determine Component Operability and Technical Specification Action Statement(s)

TASK NUMBER: 112670302

JPM NUMBER: 19-01 NRC SRO-A3

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.2.37

IMPORTANCE FACTOR: RO: ____ SRO: 4.6

APPLICABILITY:
EO [ ] **RO** [ ] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Classroom / Simulate

REFERENCES: S1.OP-SO.DG-0005, Rev. 10 (checked 1-16-20)
Salem Unit 1 Tech Specs 3.8.1.1 & S1.OP-SO.SW-0005 Rev 47

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: **N/A**

Developed By:	**R. Chan** **Instructor**	**Date: 1-16-20**
Validated By:	**Moore / Chapman** **SME or Instructor**	**Date: 1-16-20 / 6-17-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 19-01 NRC SRO-A3

Rev #	Date	Description	Validation Required
00	9-4-18	**This is a NEW JPM**. Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-4-18	Incorporated NRC Prep week comments. Comment is enhancements to clarify a question and re-validation is not required.	No
02	8-6-19	**MODIFIED** JPM to use SW component failure.	Yes
03	6-17-20	Deleted Part 2 of the JPM per NRC Prep Week comments to reduce duration time.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative Topics – Equipment Control

TASK: Determine Component Operability and Technical Specification Action Statement(s)

TASK NUMBER: 112670302

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **ENSURE** copy of S1.OP-SO.DG-0005 **and** Unit 1 Technical Specifications are available per candidate**.**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Administrative Topics – Equipment Control

TASK: Determine Component Operability and Technical Specification Action Statement(s)

TASK NUMBER: 112670302

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- 13 SW Pump is C/T for motor replacement. Tagged at 0300 hours today.
- 1A EDG fails its Surveillance Test and was declared **INOPERABLE** today at 1200 hours.

INITIATING CUE:

- You are the Unit 1 CRS.
- What Technical Specification Action statement(s) are applicable and why?

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 T/S 3.8.1.1 actions b1 (1 hour), b3 (24 hours), b4 (72 hours) is applicable. The candidate provides correct supporting information to T/S action and IAW attached answer key.**

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Generic Admin - Emergency Plan

TASK: Classify the Emergency and complete the ICMF

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**EVALUATOR'S CUE:** **PROVIDE** copies of: ▪ S1.OP-SO.DG-0005 ▪ S1.OP-SO.SW-0005			
	CUE:	**PROVIDE** the operator the initiating cue AND **ENTER** START TIME AFTER operator repeats back the Initiating Cue. **START TIME:_____**			
*	**PART 1**	What Technical Specification Action statement(s) are applicable and why?	**Candidate determines the following Tech Spec action statement(s) are applicable:** **3.8.1.1 Action b.1 (1 hour), b.3 (24 hours), and b.4 (72 hours) for 1A EDG Inoperable.** **Evaluator's Note:** TS 3.7.4.1 is not applicable at this time with 13 SW Pump Inoperable since you still meet the requirements for having two Operable SW Loops Operable (one pump per bus and two pumps per bay Operable). Therefore, TS 3.8.1.1.b2 is not applicable at this time.		

OPERATOR TRAINING PROGRAM NAME: _____

JOB PERFORMANCE MEASURE DATE: _____

SYSTEM: Generic Admin - Emergency Plan

TASK: Classify the Emergency and complete the ICMF

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME:_____**	**Terminate JPM after Candidate submits the response to you.**		

EXHIBIT 1
(Page 1 of 4)

LCO 3.8.1.1 – AC ELECTRICAL POWER SOURCES
PLANT CONFIGURATION EXAMPLES

Emergency Diesel Generators - T/S 3.8.1.1, Action b.2

This Action for an inoperable EDG is comparable to the deleted T/S Section 3.0.5, except that 4 hours are now provided for component evaluation and repair, instead of 2 hours. The overall intent of T/S 3.8.1.1, Action b.2 is threefold:

1) Allows operation to be governed by LCO 3.8.1.1, rather than the individual action statements for each affected system or component.

2) Provides direction for a unit shutdown (6 hours to Mode 3, following 30 hours to Mode 5) that obviates the need for entry into TS Section 3.0.3.

3) Provides assurance that a loss of offsite power, during the period that an EDG is inoperable, will NOT result in a complete loss of safety function.

When an EDG is declared inoperable and T/S 3.8.1.1, Action b.2 is applied, there are 3 possible outcomes:

1) All affected components remain operable,

2) Certain affected components are declared inoperable and those component T/S Action Statements are entered,

3) The unit is shutdown (6 hours to Mode 3, following 30 hours to Mode 5).

The application of T/S 3.8.1.1, Action b.2 varies depending on the components involved, and is best illustrated by example. All examples assume Mode 1 operation and that no repairs are made.

Case #1

ANSWER KEY

Case Studies from S1.OP-SO.DG-0005, Exhibit 1:

Case #1

1A EDG is declared inoperable and all other components are operable.

Since all required redundant systems and components are operable, the loads on 1A EDG remain operable. Given the performance of the required surveillance, the EDG must be restored to operable status within 72 hours IAW T/S 3.8.1.1, Action b.4.

Special Case D – Service Water

11 SW Pump is declared inoperable at 0300 hrs. 1A EDG is declared inoperable at 0600 hrs.

Since the required redundant equipment that contributes to "one pump per bus and two pumps per bay" is OPERABLE, then 15 & 16 SW Pumps remain OPERABLE. Given the performance of the required surveillance, 1A EDG must be restored to OPERABLE status within 72 hours IAW T/S 3.8.1.1, Action b.4.

If a loss of offsite power occurred after 1A EDG became inoperable, 12 & 14 SW Pumps would be running and the safety function would be satisfied.

Special Case E – Service Water

11 & 13 SW Pumps are both declared inoperable at 0300 hrs and the 72-hour Action is entered.
1A EDG is declared inoperable at 0600 hrs.

Since required redundant equipment is inoperable, 15 & 16 SW Pumps should be declared inoperable by 1000 hrs. One SW Loop, however, is still OPERABLE; e.g.; 2 pumps on 2 separate buses. Given the performance of the required surveillance, 1A EDG must be restored to OPERABLE status within 72 hours IAW T/S 3.8.1.1, Action b.4. In addition, either 11 OR 13 SW Pump must be repaired within the original 72-hour limit.

If a loss of offsite power occurred after 1A EDG was declared inoperable, 12 & 14 SW Pumps would be running and the safety function would be satisfied.

ANSWER KEY

ATTACHMENT 1
(Page 1 of 3)

REDUNDANT EQUIPMENT LIST

1A BUS COMPONENTS	1B BUS COMPONENTS	1C BUS COMPONENTS	TECH SPEC
1A EDG	1B EDG	1C EDG	3.8.1.1
1A VITAL BUS	1B VITAL BUS	1C VITAL BUS	3.8.2.1
15 SW PUMP OR 16 SW PUMP (1)	13 SW PUMP OR 14 SW PUMP (1)	11 SW PUMP OR 12 SW PUMP (1)	3.7.4.1
11 SI PUMP	N/A	12 SI PUMP	3.5.2
11 CC PUMP	12 CC PUMP	13 CC PUMP	3.7.3.1
11 RHR PUMP	12 RHR PUMP	N/A	3.5.2, 3.5.3, 3.4.1.3, 3.4.1.4
11 CS PUMP	N/A	12 CS PUMP	3.6.2.1
1CS16, SPR ADD TK DSCH V	N/A	1CS17, SPR ADD TK DSCH V	3.6.2.2
11 AF PUMP (2)	12 AF PUMP (2)	N/A	3.7.1.2
N/A	11 CV PUMP	12 CV PUMP	3.1.2.1, 3.1.2.2, 3.1.2.3, 3.1.2.4, 3.5.2, 3.5.3
11 CHILLER	12 CHILLER	13 CHILLER	3.7.10
11 CH PUMP	12 CH PUMP	N/A	3.7.10
11 CTL EMER A/C SUP FAN	N/A	12 CTL EMER A/C SUP FAN	3.7.6.1
N/A	12 ABV SUP FAN	11 ABV SUP FAN	3.7.7.1
11 ABV EXH FAN	12 ABV EXH FAN	13 ABV EXH FAN	3.7.7.1
11 CFCU (3)	12 CFCU and 14 CFCU(3)	13 CFCU and 15 CFCU (3)	3.6.2.3 (3)
11 FHB EXH FAN	12 FHB EXH FAN	N/A	3.9.12
11 BAT PUMP	N/A	12 BAT PUMP	3.1.2.2,
11 H2 RECOMBINER	12 H2 RECOMBINER	N/A	3.6.4.2
11 FO TRANSFER PUMP	12 FO TRANSFER PUMP	N/A	3.8.1.1.b.2, Action f.

(1) One SW Pump may be inoperable on each redundant bus to satisfy T/S 3.7.4.1. However, at least 2 SW Pumps per Bay are required [Refer to S1.OP-SO.SW-0005(Q)].

(2) 13 AF Pump is considered a redundant pump to 11 & 12 AF Pump and must be OPERABLE when 1A OR 1B DG is to be removed from service. T/S 3.7.1.2 is applicable when 13 AF Pump is inoperable. Refer to Exhibit 1.

(3) Three CFCUs are required to be OPERABLE to satisfy the Safety Function (Refer to Exhibit 1 for Fan Coil Units).

ANSWER KEY

Attachment 2, Service Water System Operability Guidelines

A. Technical Specification

3.7.4.1 At least two independent Service Water loops shall be OPERABLE.

Guidelines

OPERABLE Service Water loops require; "A" a combination of OPERABLE Service Water Pumps, **AND** "B" valves and piping, as detailed below:

1. Pump Requirements:

   a. In order to have two independent OPERABLE Service Water loops, the following SW pumps are required as a minimum:

      (1) One OPERABLE SW pump powered from the A vital bus, **AND**

      (2) One OPERABLE SW pump powered from the B vital bus, **AND**

      (3) One OPERABLE SW pump powered from the C vital bus, **AND**

      (4) Two OPERABLE SW pumps per Bay.

   b. In order to have one OPERABLE SW loop, the following SW pumps are required as a minimum:

      (1) One OPERABLE SW pump powered from the A vital bus **AND** one OPERABLE SW pump powered from the B vital bus,

      OR

      (2) One OPERABLE SW pump powered from the A vital bus **AND** one OPERABLE SW pump powered from the C vital bus,

      OR

      (3) One OPERABLE SW pump powered from the B vital bus, **AND** one OPERABLE SW pump powered from the C vital bus

PART 1

ANSWER KEY

What Technical Specification Action statement(s) are applicable and why?

T/S 3.8.1.1, Actions b.1 (1 hour), b.3 (24 hours), and b.4 (72 hours)

Why?

Two (2) SW Loops remain Operable.

Enter TS LCO for 1A EDG Inoperable only; redundant SW Loops are operable.

Supporting Bases:

- With 13 SW Pump Inoperable; TWO SW Loops remain Operable based on meeting the requirements for one SW Pump powered from each vital bus and two SW Pumps Operable per Bay as defined in S1.OP-SO.DG-0005, Attachment 2, page 102.

C Bus	C Bus	B Bus	B Bus	A Bus	A Bus
11	12	13 C/T	14	15	16
#1 SW Bay Pumps			#3 SW Bay Pumps		

IAW S1.OP-SO.SW-0005, Attachment 2, in order to have two independent OPERABLE Service Water loops, the following SW pumps are required as a minimum:

(1) One OPERABLE SW pump powered from the A vital bus, **AND**

YES - 15 & 16 SW Pumps are Operable

(2) One OPERABLE SW pump powered from the B vital bus, **AND**

YES - 14 SW Pump is Operable

(3) One OPERABLE SW pump powered from the C vital bus, **AND**

YES - 11 & 12 SW Pumps are Operable

(4) Two OPERABLE SW pumps per Bay.

#1 SW Bay – YES -11 & 12 SW Pumps are Operable

#3 SW Bay – YES - 15 & 16 SW Pumps are Operable

Part 1 - Continued

- **Since 1A EDG is declared INOPERABLE and ALL other components are Operable (i.e., TWO SW Loops remain Operable), THEN T/S 3.8.1.1, Actions b.1 (1 hour), b.3 (24 hours), and b.4 (72 hours) are applicable.**

- With TWO SW Loops OPERABLE, the required redundant system or component remains Operable and T/S 3.8.1.1, Action b.2 is not applicable.

- **This condition is Special Case D** – Service Water or Case #1 from S1.OP-SO.DG-0005, Exhibit 1. 1A EDG must be restored to Operable status within 72 hours IAW T/S 3.8.1.1, Action b.4.

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC SRO-A3

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __10___ Date ___1-16-20____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-16-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	M. Chapman	Date:	6-17-20

INITIAL CONDITIONS:

- Salem 1 is at 100% power.
- 13 SW Pump is C/T for motor replacement. Tagged at 0300 hours today.
- 1A EDG fails its Surveillance Test and was declared **INOPERABLE** today at 1200 hours.

INITIATING CUE:

- You are the Unit 1 CRS.
- What Technical Specification Action statement(s) are applicable and why?

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative Topics – Radiation Control

TASK: Select Release Path for Radioactive Liquid Waste Release IAW S1.OP-SO.WL-0002

TASK NUMBER: N0680070302

JPM NUMBER: 19-01 NRC SRO-A4

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.3.6

IMPORTANCE FACTOR: RO: ____ SRO: 3.8

APPLICABILITY:
EO [ ] **RO** [ ] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Classroom

REFERENCES: S1.OP-SO.WL-0002, Rev 31 (checked 1-16-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-16-20**
Validated By:	**Moore / Chapman** **SME or Instructor**	**Date: 1-16-20 / 6-17-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

REVISION HISTORY

JPM NUMBER: 19-01 NRC SRO-A4

Rev #	Date	Description	Validation Required
00	8-5-19	K/A 2.3.6, SRO 3.8, Ability to approve release permits.	Yes
01	6-17-20	Deleted task to trace out release path using drawings per NRC Prep Week comment to shorten duration of JPM.	No

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative Topics – Radiation Control

TASK: Select Release Path for Radioactive Liquid Waste Release IAW S1.OP-SO.WL-0002

TASK NUMBER: N0680070302

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **PROVIDE** marked up copy of procedure and ensure S1.OP-SO.WL-0002 Attachment 2 all steps up to step 2.2.2 are filled out.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SYSTEM: Generic Administrative Topics – Radiation Control

TASK: Select Release Path for Radioactive Liquid Waste Release IAW S1.OP-SO.WL-0002

TASK NUMBER: N0680070302

INITIAL CONDITIONS:

- Unit 2 is in a refueling outage.
- **ALL** Unit 2 Circulators are out of service.
- 21 CCHX is in service at 1500 gpm and 22 CCHX is removed from service and drained.
- Salem Unit 1 is operating at 75% power.
- There are no active Tech Specs on Unit 1.
- 12A Circulator is C/T for waterbox cleaning.
- 11 and 12 CCHX's are in service.
- 12 CVCS Monitor Tank is in recirculation using 11 CVCS Monitor Tank Pump.
- Chemistry has granted permission to release the tank with a minimum dilution flow rate of 100,000 gpm.

INITIATING CUE:

- You are the Unit 1 CRS.
- **DETERMINE** which CCHX will be selected for the release of 12 CVCS Monitor Tank IAW S1.OP-SO.WL-0002, Attachment 2, Section 2.2 Release Verification.

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. **Selects 21 CCHX to 12A AND/OR 12B CW Pumps in service as release path.**

SYSTEM: **Generic Administrative Topics – Radiation Control**
TASK: **Select Release Path for Radioactive Liquid Waste Release IAW S1.OP-SO.WL-0002**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	Provide marked up copy of: ▪ S1.OP-SO.WL-0002			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
*	1	**DETERMINE** which CCHX will be selected for the release of 12 CVCS Monitor Tank IAW S1.OP-SO.WL-0002, Attachment 2, Section 2.2 Release Verification.	**Selects 21 CCHX to 12A AND/OR 12B CW Pumps in service as release flow path.**		
	CUE:	**JPM is Complete** **RECORD** the STOP TIME**:** **STOP TIME:_____**	**Terminate JPM when SRO submits the completed Cue Sheet to the Evaluator.**		

ANSWER KEY

- **DETERMINE** which CCHX will be selected for the release of 12 CVCS Monitor Tank IAW S1.OP-SO.WL-0002, Attachment 2, Section 2.2 Release Verification.

21 CCHX AND 12A AND/OR 12B CW Pumps In Service

ANSWER KEY

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM #: 19-01 NRC SRO-A4

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __31___ Date ____1-16-20____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-16-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	M. Chapman	Date:	6-17-20

INITIAL CONDITIONS:

- Unit 2 is in a refueling outage.
- **ALL** Unit 2 Circulators are out of service.
- 21 CCHX is in service at 1500 gpm and 22 CCHX is removed from service and drained.
- Salem Unit 1 is operating at 75% power.
- There are no active Tech Specs on Unit 1.
- 12A Circulator is C/T for waterbox cleaning.
- 11 and 12 CCHX's are in service.
- 12 CVCS Monitor Tank is in recirculation using 11 CVCS Monitor Tank Pump.
- Chemistry has granted permission to release the tank with a minimum dilution flow rate of 100,000 gpm.
-

INITIATING CUE:

- You are the Unit 1 CRS.

- **DETERMINE** which CCHX will be selected for the release of 12 CVCS Monitor Tank IAW S1.OP-SO.WL-0002, Attachment 2, Section 2.2 Release Verification.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Generic Administrative Topics - Emergency Plan

TASK: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

TASK NUMBER: 1240020502

JPM NUMBER: 19-01 NRC SRO-A5

ALTERNATE PATH: [ ]

K/A NUMBER: G 2.4.41

IMPORTANCE FACTOR: RO: ____ SRO: 4.6

APPLICABILITY:
EO [ ] **RO** [ ] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Classroom

REFERENCES: EP-SA-325-101, Rev. 01 (checked 1-16-20)
EP-SA-325-123, Rev 00
EP-SA-325-F4, Rev 01

TOOLS AND EQUIPMENT: Salem ECG Books Rev 6

VALIDATED JPM COMPLETION TIME: 8 mins

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: 15 mins / 15 mins

Developed By:	**R. Chan** **Instructor**	**Date: 1-16-20**
Validated By:	**Moore / Chapman** **SME or Instructor**	**Date: 1-16-20 / 6-17-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

JPM NUMBER: 19-01 NRC SRO-A5

Rev #	Date	Description	Validation Required
00	8-6-19	**NEW JPM for 19-01 ILOT NRC Exam**.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative Topics - Emergency Plan

TASK: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

TASK NUMBER: 1240020502

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- ENSURE sufficient BLANK copies of EP-SA-325 Attachments 1 thru 4.
- ENSURE sufficient copies of ECG books and/or wall charts.

NAME: _____

DATE: _____

SYSTEM: Generic Administrative Topics - Emergency Plan

TASK: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

TASK NUMBER: 1240020502

INITIAL CONDITIONS:

- Unit 2 experienced a Large Break LOCA and an Automatic Safety Injection (SI).
- All available equipment started following SI signal.
- An **ALERT** was declared based on EAL# RB1.L, Loss of the Reactor Coolant System Barrier.
- The Emergency Core Cooling System (ECCS) is currently aligned for Cold Leg Recirculation IAW EOP-LOCA-3.
- The crew is responding to the following alarms and indications:
  - OHA C-26, 21 RHR SUMP OVRFLO
  - Auxiliary Typewriter alarm point; 21 RHR Sump Pump start.
  - 2R41D, Plant Vent Radiation Monitor, indicating 3.18E+05 µCi/sec and rising
- The crew responded to the alarms/indications by closing the 21SJ44, Containment Sump Suction Valve, to isolate the leak but the valve failed to close.
- The OCC is briefing a field team to investigate the breaker associated for the 21SJ44 valve.
- The 2R44A and 2R44B, Containment High range Radiation Monitors, are currently reading 305 R/Hr.
- The 2R41D, Plant Vent Radiation Monitor, is currently reading 5.12E+6 µCi/sec and rising.
- Met Tower data indicates wind from 180 degrees at 5 mph.

INITIATING CUE:

- You are the Emergency Coordinator (EC).
- **CLASSIFY** the event AND **COMPLETE / APPROVE** the ICMF IAW the applicable procedure.
- **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. **Classifies the event as a General Emergency (GE) 13 points based on RB1.L or RB2.L (5 pts), FB2.L (5 pts) and CB2.L (3 pts) or CB3.L (3 pts) within 15 minutes**
2. **Correctly completes sections I thru V of the ICMF IAW with attached answer key for the classified event within 15 minutes from event declaration.**

This page left intentionally blank

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topics - Emergency Plan

Task: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**PROVIDE** the following materials: ▪ Salem ECG books (Rev 6) and/or wall charts ▪ Blank copies of Attachments 1 thru 4 (EP-SA-325-F1/F2/F3/F4)			
	CUE:	**READ to the Operator:** **THIS IS A TIME CRITICAL JPM.** **You will be giving time to REVIEW the Initial Conditions on the Cue Sheet. The JPM will START once you have completed your review and acknowledge the Initiating Cue. The time will stop when you have classified the event and submitted the ICMF to the Lead Evaluator.** Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____	Operator reviews initial conditions and acknowledges the initiating cue.		

OPERATOR TRAINING PROGRAM **NAME:**_____

JOB PERFORMANCE MEASURE **DATE:**_____

System: Generic Administrative Topics - Emergency Plan

Task: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		**CLASSIFY** the event.	**Operator classifies the event as a General Emergency (GE) 13 points based on EAL#s: RB1.L or RB2.L (5 pts), FB2.L (5 pts) and CB2.L (3 pts) or CB3.L (3 pts) within 15 minutes from when the JPM started.**		
*		**COMPLETE / APPROVE the** ICMF	**Evaluator's Note**: Attachments 1 thru 4 will be made available. The operator will have to select the correct Attachment based on the classification. **Operator correctly fills out Sections I thru V of the ICMF for General Emergency (GE) IAW EP-SA-325-F4, Attachment 4. Completing the ICMF within 15 minutes from when he event was declared on the ICMF form** **Note: A release is in progress due to the event**. **Note:** See attached **ANSWER KEY** for complete and accurate ICMF.		

System: Generic Administrative Topics - Emergency Plan

Task: Classify the Event and Complete / Approve the ICMF IAW EP-SA-325-101

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**JPM is Complete.** **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator submits the ICMF form.**		

ANSWER KEY

EP-SA-325-F4
ATT 4
Pg. 2 of 8

INITIAL CONTACT MESSAGE FORM

I. THIS IS _____, COMMUNICATOR IN THE ☑ CONTROL ROOM
(NAME) ☐ TSC
☐ EOF
AT THE **SALEM** NUCLEAR GENERATING STATION, **UNIT**(s) No. 2

IIa. ☐ THIS IS NOTIFICATION OF AN **GENERAL EMERGENCY** WHICH WAS

DECLARED AT	Current Time (Time - 24 HR CLOCK)	ON	Today (DATE)

EAL #	RB1.L or RB2.L	,	FB2.L	,	CB2.L or CB3.L

DESCRIPTION OF EVENT: Loss of Reactor Coolant System Barrier, Loss of Fuel Clad Barrier, Loss of the Containment Barrier

OR

IIb. ☐ THIS IS NOTIFICATION OF A PROTECTIVE ACTION RECOMMENDATION UPGRADE MADE AT _____ (Time - 24 HR CLOCK) HRS ON _____ (DATE)

Reason for PAR Upgrade:

III. ☑ THERE **IS** A RELEASE IN PROGRESS DUE TO THE EVENT
☐ THERE IS **NO** RELEASE IN PROGRESS DUE TO THE EVENT
} Any release above normal, attributable to the event. See Basis for examples

IV.	33 FT. LEVEL WIND DIRECTION (From): (From MET Computer /SPDS)	180 (DEGREES)	WIND SPEED:	5 (MPH)

V.	Sectors	Dist. - Mile
☑ WE RECOMMEND **EVACUATION** AS FOLLOWS	ALL	0-5
☐ WE RECOMMEND **SHELTERING** AS FOLLOWS		
☑ WE RECOMMEND **MONITOR AND PREPARE** AS FOLLOWS	ALL	5-10
☑ WE RECOMMEND THE **USE OF KI** IN ACCORDANCE WITH STATE PROCEDURES		

EC Initials
(Approval to Transmit ICMF)

SGS Rev. 1

ANSWER KEY

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM #: 19-01 NRC SRO-A5

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __01___ Date _____1-16-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-16-20

SME/Instructor: R. Moore Date: 1-16-20

SME/Instructor: M. Chapman Date: 6-17-20

INITIAL CONDITIONS:

- Unit 2 experienced a Large Break LOCA and an Automatic Safety Injection (SI).
- All available equipment started following SI signal.
- An **ALERT** was declared based on EAL# RB1.L, Loss of the Reactor Coolant System Barrier.
- The Emergency Core Cooling System (ECCS) is currently aligned for Cold Leg Recirculation IAW EOP-LOCA-3.
- The crew is responding to the following alarms and indications:
    - OHA C-26, 21 RHR SUMP OVRFLO
    - Auxiliary Typewriter alarm point; 21 RHR Sump Pump start.
    - 2R41D, Plant Vent Radiation Monitor, indicating 3.18E+05 µCi/sec and rising
- The crew responded to the alarms/indications by closing the 21SJ44, Containment Sump Suction Valve, to isolate the leak but the valve failed to close.
- The OCC is briefing a field team to investigate the breaker associated for the 21SJ44 valve.
- The 2R44A and 2R44B, Containment High range Radiation Monitors, are currently reading 305 R/Hr.
- The 2R41D, Plant Vent Radiation Monitor, is currently reading 5.12E+6 µCi/sec and rising.
- Met Tower data indicates wind from 180 degrees at 5 mph.

INITIATING CUE:

- You are the Emergency Coordinator (EC).
- **CLASSIFY** the event AND **COMPLETE / APPROVE** the ICMF IAW the applicable procedure.
- **THIS IS A TIME CRITICAL JPM**.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed Open Pressurizer Spray Valve IAW S2.OP-AB.PZR-0001

TASK NUMBER: 1140240401

JPM NUMBER: 19-01 NRC Sim-a

ALTERNATE PATH: [X] **K/A NUMBER:** 010 A4.01

IMPORTANCE FACTOR: 3.7 (RO) 3.5 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-AB.PZR-0001, Rev. 18 (checked 6-17-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 1-13-20**

Validated By: **Kovalcsik / Chapman** **SME or Instructor** **Date: 6-17-20**

Approved By: **N/A** **Training Department** **Date:**

Approved By: **N/A** **Operations Department** **Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE
REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-a

Rev #	Date	Description	Validation Required
00	3-12-18	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA. Incorporated changes to 2-EOP-APPX-1 Rev. 25.	Yes
01	7-19-18	Added step 3.33 if CAS action is taken first. Identified an alternate step at which the JPM can be terminated. These changes do not require re-validation since they do not change the course of actions previously validated that the operator is required to perform to meet the task standard. See Rev. 0 for validator approvals.	No
02	9-17-19	**MODIFIED JPM** that initial failure is with PZR pressure channel failing high then the Alternate Path is one of the spray valves fails to fully close requiring a reactor trip and stopping RCPs. 010 K/A A4.01: Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: PZR spray valve	Yes
03	6-17-20	Incorporated NRC Prep Week comments to modify the alternate path such that the 2PS1 fails fully open and operator can take to manual and close. Modified Task Standard to stops RCS pressure decrease or stops 21 and 23 RCPs.	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

TASK NUMBER: 1140240401

SIMULATOR IC: IC-201

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	PR0016A, PZR Press Channel 1 fails high	N/A	N/A	N/A	RT-1	2500
02	PR0019A, 2PS1 Spray Valve fails open	N/A	N/A	N/A	ET-5	TRUE

3. These malfunctions will simulate a PZR Pressure channel failing high causing both spray valves to fully open. RCS pressure will rapidly lower. [Alternate Path] When operator takes manual control of MPC and lowers demand to close spray valves, the operator will recognize that the 2PS1 is fully open. The operator will place 2PS1 in manual and close 2PS1.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01						

EVENT TRIGGERS:

ET#	Description	Command
5	QB214PRI, MPC Pressure Increase PB	
6	KB214DMI, 2PS1 PZR Spray Control Manual	DMF PR0019A

SPECIAL INSTRUCTIONS:

- Additional instructor to assist in silencing alarms following reactor trip.
- **PROVIDE** Examiner copy of S2.OP-AB.PZR-0001.

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

TASK NUMBER: 1140240401

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all indications and alarms.
- Your evaluator will respond to all alarms not related to your task.

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. Stops the RCS pressure decrease by closing 2PS1, or Trips the Reactor and stops 21 and 23 RCPs, before an Automatic SI occurs.

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	**Examiner's Note**: Have a copy of S2.OP-AB.PZR-0001 on hand to follow along with candidate.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	CUE:	**Simulator Operator:** Insert **RT-1** on direction from Lead Examiner. **PR0016A** , PZR Pressure Channel 1 fails high	**Examiner's Note**: During validation it took approx. 1 minute and 45 seconds for the Auto RX Trip to occur with NO operator action taken.		

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	NOTE	**Examiner's Note**: When the PZR Pressure channel failure is inserted, the following actions may be taken by the operator **PRIOR** to entering AB.PZR-0001 first: 1. Place Master Pressure Controller in Manual. 2. Lower demand on MPC (Press Inc PB) to close spray valves 3. Places 2PS1 in Manual and depresses close pushbutton			
	CUE:	The following alarms will come after RT-1 is inserted: • **OHA D-8, RC PRESS HI** • **OHA E-42, 2PR1 1/2 TRIP**	Operator scans the control board and recognizes that PZR Pressure Channel 1 is failed high.		
	NOTE	**Examiner's Note**: IF the operator enters AB.PZR-0001 first, THEN go to **Page 8 for AB.PZR-0001 Steps.** **The steps below are actions taken by the operator from memory based on the rapid RCS pressure decrease with both spray valves open**.			

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*		Operator takes manual control of Master Pressure Controller.	**Operator depresses the MANUAL pushbutton for the Master Pressure Controller (MPC)**		
*		Operator LOWERS demand on MPC to close spray valves. **Simulator Operator**: ENSURE **ET-5** is TRUE when the MPC PRESS INC PB is depressed. This will insert malfunction to fail open 2PS1.	**Operator depresses the PRESS INC pushbutton on the MPC to lower the demand.**		
		ALTERNATE PATH STARTS HERE:	**2PS1 Spray Valve Fails Fully Open**		
		When MPC demand is zero or adjusted for closing both spray valves, the operator recognizes that 2PS1 is fully open.	Operator reports 2PS1 is remains fully OPEN.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*		Operator places 2PS1 in Manual and closes 2PS1. **Simulator Operator**: ENSURE **ET-6** is TRUE when 2PS1 MANUAL PB is depressed. This will delete malfunction for failed open spray valve and allow operator to close the 2PS1.	**Operator depresses MANUAL pushbutton for 2PS1 and then depresses the CLOSE pushbutton.** **Note:** 2PS1 valve demand will lower, but It will take a few seconds for the 2PS1 to stroke close. **JPM COMPLETE when 2PS1 is CLOSED**		
		Operator reports 2PS1 is closed and RCS pressure is stable or raising.			
	AB.PZR	**Enters S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction**	Enters **S2.OP-AB.PZR-0001** directly or via OHA D-8 OR E-42 ARP. **Examiner's Note*:*** It is acceptable to attempt closing 2PS1 prior to entering S2.OP-AB.PZR-001.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.1	**INITIATE** Attachment 1 Continuous Action Summary. IF AT ANY TIME RCS pressure drops to 2000 psig and continues to drop, THEN: 1. **TRIP** the Reactor 2. **GO TO** 2-EOP-TRIP-1, Reactor Trip or Safety Injection, AND **CONTINUE** with this procedure.	Initiates Attachment 1 Continuous Action Summary. **IF** a Manual or Automatic Rx Trips occurs at this point, THEN use the following CUE **CUE: The crew will implement EOP-TRIP-1, CRS directs you to continue performing AB.PZR-0001** **Examiner's Note: IF the operator initiates the CAS here, THEN the operator actions below performed IAW AB.PZR-0001 are Critical Steps:** **1. Trips the Reactor** **2. Stops 21 and 23 RCPs**		
	3.2	Is POPS in service?	No - Determines POPS is not in service by initial conditions or console indications.		
	3.3	Is the controlling Pressurizer Pressure Control Channel (I or III) failed?	YES - Determines Pressurizer Pressure Control Channel I is failed.		
*	3.5	PLACE the Master Pressure Controller in MANUAL	**PLACES MPC in MANUAL (if not previously performed).**		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	3.6	ADJUST MPC demand signal to be consistent with Attachment 2, to restore pressure to program value. **Simulator Operator**: **ENSURE ET-5** is TRUE when operator places MPC in Manual and depresses the Increase Pressure pushbutton on MPC. This will insert the malfunction for 2PS1 failing open,	**Operator ADJUSTS MPC demand using Attachment 2.** **Examiner's Note**: MPC demand should eventually be adjusted to 0% to close spray valves and turn on PZR heaters.		
	3.6	SELECT the other Pressure Control Channel	Operator selects Channel 3.		
	3.7	RETURN the MPC to AUTO	Operator places MPC in AUTO		
		ALTERNATE PATH STARTS HERE:	**2PS1 Spray Valve did not fully close**		
		2PS1 Spray Valve not fully closed	Operator recognizes 2PS1 is not fully closed based on OPEN indication and 100% demand. **Examiner's Note**: Operator can go back to beginning of procedure or go directly to Step 3.17.		
	3.17	Is a Spray Valve(s) failed? (Refer to Attachment 2 for guidance)	Yes - Determines 2PS1 is NOT fully closed.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Pressurizer Pressure Control System

TASK: Respond to Failed open Pressurizer Spray Valve IAW AB.PZR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	3.18	**PLACE** the Spray Valve(s) in MANUAL **Simulator Operator**: ENSURE **ET-6** is TRUE if operator depresses CLOSED pushbutton for 2PS1. This will delete malfunction for 2PS1 fail open and allow operator to close the valve.	**Depresses MANUAL PB for 2PS1.**		
*	3.19	**OPERATE** the Spray Valves to control pressure consistent with Attachment 2.	**Depresses the CLOSE PB for 2PS1 and recognizes that 2PS1 demand is lowering and open light has extinguished.** Note: It will take a few seconds for the 2PS1 to stroke close **Operator reports 2PS1 is CLOSED**. **JPM COMPLETE**		
	CUE	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN RECORD the STOP TIME: **STOP TIME:_____**	**JPM is COMPLETE when the 2PS1 is closed.**		

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __18___ Date ____6-17-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

RC 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

RC 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 6-17-20

SME/Instructor: M. Chapman Date: 6-17-20

SME/Instructor: D. Kovalcsik Date: 6-17-20

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.

INITIATING CUE:

- You are the Reactor Operator.
- Respond to all indications and alarms.
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

TASK NUMBER: 1140730402

JPM NUMBER: 19-01 NRC Sim-b

ALTERNATE PATH: [X]

K/A NUMBER: 005 A2.03

IMPORTANCE FACTOR:	**RO**	**SRO**
	2.9	3.1

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-AB.RHR-0001, Rev. 21 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 25 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 1-13-20**

Validated By: **Moore / Klein** **SME or Instructor** **Date: 1-13-20**

Approved By: **N/A** **Training Department** **Date:**

Approved By: **N/A** **Operations Department** **Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE
REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-b

Rev #	Date	Description	Validation Required
00	9-17-19	**MODIFIED JPM** for a loss of both RHR pumps. 005 K/A A2.03: Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR pump/motor malfunction	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

TASK NUMBER: 1140730402

SIMULATOR IC: IC-202

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	21 RHR Pump trips	N/A	N/A	N/A		
02	22 RHR pump trips	00:00:03	N/A	N/A	ET-1	

3. These malfunctions will simulate 21 RHR Pump tripping on electrical fault. 22 RHR pump will start then trip for unknown reasons. (Alternate Path) With the RCS depressurized and vented, the Operator will perform Attachment 8 COLD LEG Injection by transferring Charging Pump suction to RWST, opening the BIT Isolation valves, and closing the charging discharge valves (2CV68 or 2CV69).

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01						

EVENT TRIGGERS:

ET#	Description	Command
1	QAA03PRN, 22 RHR start bezel light	
2		
3		
4		

SPECIAL INSTRUCTIONS:

- **Ensure** RHR process diagram on P250
- **Ensure** bezel tags for 21 & 22 SI Pumps and 22 CV Pump being C/T
- Additional instructor to assist in silencing alarms following reactor trip.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

TASK NUMBER: 1140730402

INITIAL CONDITIONS:

- Unit 2 is in Mode 5 following a 30 day refueling outage.
- The RCS is depressurized **AND** vented using 2PS59 as the approved vent path.
- The Containment Equipment Hatch is CLOSED.
- The crew is performing S2.OP-IO.ZZ-0002, Cold Shutdown to Hot Standby.

Plant conditions are as follows:

- PZR level is 30%
- 21 Charging Pump in service
- 21 and 22 SI Pumps are C/T
- 22 Charging Pump is C/T
- RHR Letdown Booster Pump in service with 2CV8 throttled
- RCS temperature is 149 °F at the RHR Inlet.
- 22 RHR Pump is aligned for Shutdown Cooling

INITIATING CUE:

- You are the Reactor Operator.
- The in-service RHR pump (21 RHR Pump) providing shutdown cooling has just tripped due to an electrical fault on the motor.
- **INITIATE** S2.OP-AB.RHR-0001, Loss of RHR.

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. Initiates COLD LEG Injection by transferring Charging Pump suction to RWST, opening BIT Isolation valves and closing Charging discharge valve IAW S2.OP-AB.RHR-0001, Attachment 8.

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____	Note: • 21 and 22 SI Pumps are C/T • 22 Charging Pump is C/T • 21 Charging Pump in service • CET 160 °F • Equipment Hatch is CLOSED		
	3.1	**INITIATE** Attachment 1, Continuous Action Summary	**CUE**: CRS will initiate the CAS, CONTINUE on with procedure.		
	3.2	IF the RCS is vented to the Containment atmosphere with the Containment Equipment hatch OPEN AND at least two RCS loops are filled with associated SG's available, THEN **CLOSE** the vent path prior to Core Boil. (Refer to ORAM report or Attachment 4)	N/A. Operator determines from the Cue Sheet that Equipment Hatch is CLOSED.		
*	NOTE	0% Pressurizer Level Cold Cal. indication corresponds to 108.92 ft. elevation, when the RCS is filled and vented.			
*	3.3	Is RCS aligned for operation <101 ft. elevation (Reduced Inventory)?	No		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.5	Is the loss of RHR due to a mechanical failure or loss of electrical power to the in-service RHR Pump?	Yes		
	3.6	**GO TO** Step 3.50			
	3.50	Is a heat sink available for Residual Heat Removal? ___ Component Cooling to RHR System ___ Service Water to Component Cooling System	Yes		
	3.51	Is an RHR Loop available?	Yes (22 RHR is available aligned for shutdown cooling)		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.52	**PLACE** the alternate RHR Loop in service: ___IF alternate RHR Loop is aligned for ECCS, THEN **PERFORM** Attachment 2, Aligning RHR Loop From ECCS To Shutdown Cooling. OR ___IF alternate RHR Loop is aligned for Shutdown Cooling, THEN **PERFORM** Attachment 3, Aligning RHR Loop For Shutdown Cooling.	Performs Attachment 3 to start 22 RHR Pump. **Operator performs the following actions in Attachment 3:** • **Closes 21RH18** • **Closes 21CC16** • **Opens 22CC16** • **Starts 22 RHR Pump** **Possible CUE: *If 2CC131 closes, then state, Extra Operator will address this continue on with procedure.***		
		ALTERNATE PATH STARTS HERE:	**22 RHR Pump Trips**		
		Examiner's Note: The Operator may return to the procedure step in effect (**Step 3.52, Page 11**) **OR** can **re-enter** the AB procedure (**Next Page**)			

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	RE-ENTER AB	**IF** Operator **re-enters** the procedure, THEN the following steps will be performed here:	Operator performs the following steps: 3.1 – **CUE:** Attachment 1 is being performed by extra operator. 3.2 – N/A 3.3 – No 3.5 – Yes 3.6 – GO TO Step 3.50 3.50 – Yes 3.51 – Return to Step 3.31 3.31 – Continue 3.32 – Initiate Attachment 8, Cold Leg Injection		
	ATT 8	Attachment 8 COLD LEG INJECTION (preferred method if RCS < 200 F)			
	1.0	MAKEUP to the RCS as follows:			
	1.A	IF the BIT flowpath AND a Charging Pump is available, THEN ALIGN feed path to the RCS as follows:	YES		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	1.A.1	1. OPEN RWST outlet to Charging Pumps: ___ 2SJ1 ___ 2SJ2	**Operator depresses the OPEN pushbuttons for 2SJ1 or 2SJ2.**		
*	1.A.2	2. CLOSE VCT outlet to Charging Pumps: ___ 2CV40 ___ 2CV41	**Operator depresses the CLOSED pushbuttons for 2CV40 or 2CV41.**		
	1.A.3	IF both Centrifugal Charging Pumps are tagged out, THEN SEND Operator to release breaker for one Centrifugal Charging Pump.	N/A. 21 Charging Pump is in service.		
	NOTE	**CAUTION** When the PS26 is the vent path, maximum flow of < 300 gpm is required when steam generator nozzle dams are installed. This may be controller by throttling the pump discharge valve.	Operator reads Caution and continues on with procedure. CUE: ***IF asked about the nozzle dams, then state: nozzle dams are not installed.***		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	1.A.4	START the designated available Charging Pump AND FEED at maximum rate by aligning the following valves in the Cold Leg Injection flow path: ___ OPEN BIT INLET: 2SJ4 or 2SJ5 ___ OPEN BIT OUTLET: 2SJ12 or 2SJ13 ___ CLOSE Charging Discharge Isolation Valves: 2CV68 or 2CV69	**21 Charging Pump already running.** **Operator depresses the OPEN pushbutton for BIT valves 2SJ4 or 2SJ5 AND 2SJ12 or 2SJ13.** **Operator CLOSES 2CV68 or 2CV69 by depressing the associated CLOSED pushbutton.** **JPM is Complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN RECORD the STOP TIME. STOP TIME:_____	**Terminate JPM when 2CV68 or 2CV69 is closed.**		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	Return to Step 3.52	**Steps start here if operator returns to the step PRIOR to performing Attachment 3:**	Operator determines that Step 3.5.2 cannot be performed and continues on to Step 3.53.		
	3.53	Is RHR in service?	No. 22 RHR Pump tripped. RETURNS to STEP 3.7		
	3.7	**CHECK** RHR cooling availability as follows: A. Is any RHR pump running?	 No		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.9	**PERFORM** the following: ___ **STOP** 2 RHR Letdown Booster Pump ___ **ISOLATE** Sampling activities ___ **ISOLATE** Normal Letdown to CVCS ___ **ISOLATE** Excess Letdown ___ **ISOLATE** RHR Letdown to CVCS ___ **TERMINATE** any known maintenance or testing in progress	Performs actions as follows" Depresses stop PB for L/D Booster Pump **CUE**: No sampling is in progress Verifies Normal L/D not in service Verifies Excess Letdown not in service Depresses CLOSED PB for 2CV8 **CUE**: CRS will terminate any maintenance or testing in progress.		
	3.10	**DETERMINE** time to core boiling using Attachment 4, Time To Reach Boiling After Loss of RHR or Attachment 5, Heatup Rate For Loss Of RHR Cooling, as applicable, if not already done in the daily ORAM report.	**CUE: *Extra operator will determine time to core boiling***.		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.11	Is RCS level >97.5 ft elevation and stable or rising consistent with current RCS makeup (Charging, SI) and no excessive indication of RCS Leakage?	Yes		
	3.12	Does the time to core boiling allow adequate time for normal restoration AND local venting of RHR System?	No **CUE**: ***CRS has determined insufficient time is available to restore RHR system. Continue on with procedure***.		
	3.20	**CONTINUE**	Operator continues on with procedure		
	3.21	IS RCS level >101 ft.?	Yes		
	3.22	**SEND** an Operator to locally monitor RHR Pump while starting.	Operator recognizes no RHR pumps available and continues on. **CUE**: If asked about status of RHR Pumps state the following: ***both RHR Pumps are being investigated***.		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.23	**START** one RHR Pump at full flow as follows: ___IF alternate RHR Loop is aligned for ECCS, THEN **PERFORM** Attachment 2, Aligning RHR Loop From ECCS To Shutdown Cooling. OR ___IF alternate RHR Loop is aligned for Shutdown Cooling, THEN **PERFORM** Attachment 3, Aligning RHR Loop For Shutdown Cooling.	Operator recognizes No RHR Pumps available and continues on with procedure.		
	3.24	**NOTIFY** local Operator to perform observation at RHR Pumps: ___ No abnormal noise ___ No seal damage ___ No RHR suction pressure oscillations	Operator determines this step is Not Applicable and continues on with procedure		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.25	Is RHR System normal as indicated by ALL of the following? ___ RHR Pumps - at least one running ___ RCS Level - >101 ft. elevation and stable or rising ___ RHR Flow - stabilized >1500 gpm ___ RCS Temperature - stable or lowering ___ No local indication of RHR Pump damage	No, no RHR Pumps are running.		
	3.30	**STOP** any running RHR Pumps.	Operator recognizes no RHR Pumps are running and continues on with procedure.		
	3.31	**CONTINUE**			

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	3.32	**INITIATE** one of the alternate methods of decay heat removal: ___ Attachment 7, Hot Leg Injection (Feed & Bleed - Preferred method if RCS not intact or Loops not filled and core exit TCs > 200°F) ___ Attachment 8, Cold Leg Injection (Feed & Bleed - Preferred Method if Core Exit TCs < 200°F) ___ Attachment 9, Steam Generator Reflux Cooling (RCS depressurized and no other means of decay heat removal is available) ___ Attachment 10, Forced Flow Or Natural Circulation Cooldown (RCS intact and filled to greater than 0% in the Pressurizer with Loops filled) ___ Attachment 11, Cooling the RCS with Spent Fuel Pool (Reactor Vessel Head Removed)	Operator performs Attachment 8, Cold Leg Injection based on Core Exit TCS less than 200 F.		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	ATT 8	**Attachment 8 COLD LEG INJECTION (preferred method if RCS < 200 F)**			
	1.0	**MAKEUP** to the RCS as follows:			
	1.A	IF the BIT flowpath AND a Charging Pump is available, THEN **ALIGN** feed path to the RCS as follows:	YES		
*	1.A.1	1. **OPEN** RWST outlet to Charging Pumps: ___ 2SJ1 ___ 2SJ2	**Operator depresses the OPEN pushbuttons for 2SJ1 or 2SJ2.**		
*	1.A.2	2. **CLOSE** VCT outlet to Charging Pumps: ___ 2CV40 ___ 2CV41	**Operator depresses the CLOSED pushbuttons for 2CV40 or 2CV41.**		
	1.A.3	IF both Centrifugal Charging Pumps are tagged out, THEN **SEND** Operator to release breaker for one Centrifugal Charging Pump.	N/A. 21 Charging Pump is in service.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	NOTE	**CAUTION** When the PS26 is the vent path, maximum flow of < 300 gpm is required when steam generator nozzle dams are installed. This may be controller by throttling the pump discharge valve.	Operator reads Caution and continues on with procedure. **CUE**: IF asked about the nozzle dams, then state: ***nozzle dams are not installed.***		
*	1.A.4	**START** the designated available Charging Pump AND **FEED** at maximum rate by aligning the following valves in the Cold Leg Injection flow path: ___ **OPEN** BIT INLET: 2SJ4 or 2SJ5 ___ **OPEN** BIT OUTLET: 2SJ12 or 2SJ13 ___ **CLOSE** Charging Discharge Isolation Valves: 2CV68 or 2CV69	**21 Charging Pump already running.** **Operator depresses the OPEN pushbutton for BIT valves 2SJ4 or 2SJ5 AND 2SJ12 or 2SJ13.** **Operator CLOSES 2CV68 or 2CV69 by depressing the associated CLOSED pushbutton.** **JPM is Complete**		

NAME: _____

DATE: _____

SYSTEM: Residual Heal Removal System

TASK: Respond to a Loss of Both RHR Pumps IAW S2.OP-AB.RHR-0001 in Mode 5 with RCS Depressurized and Vented

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when 2CV68 or 2CV69 is closed.**		

S2.OP-AB.PZR-0001:

ATTACHMENT 8
(Page 1 of 8)

COLD LEG INJECTION (preferred method RCS < 200°F)

[C0354]

CAUTION
___ Only Borated water should be added to the RCS to maintain adequate Shutdown Margin.
___ Any opening in the RCS boundary could result in release of high temperature fluids, radioactive water, or gases to Containment.
___ Violation of Technical Specification 3.5.3 requires notifications IAW ECG.

___ 1.0 **MAKEUP** to the RCS as follows:

___ A. IF the BIT flowpath AND a Charging Pump is available, THEN **ALIGN** feed path to the RCS as follows:

___ 1. **OPEN** RWST outlet to Charging Pumps:

___ ♦ 2SJ1

___ ♦ 2SJ2

___ 2. **CLOSE** VCT outlet to Charging Pumps:

___ ♦ 2CV40

___ ♦ 2CV41

___ 3. IF both Centrifugal Charging Pumps are tagged out, THEN **SEND** Operator to release breaker for one Centrifugal Charging Pump.

COLD LEG INJECTION

1.0 (continued)

CAUTION
___ **When the PS25 is the vent path, maximum flow of <300 gpm is required when steam generator nozzle dams are installed. This may be controlled by throttling the pump discharge valve.**

___ 4. **START** the designated available Charging Pump AND **FEED** at maximum rate by aligning the following valves in the Cold Leg Injection flow path:

___ ♦ **OPEN** BIT INLET: 2SJ4 or 2SJ5

___ ♦ **OPEN** BIT OUTLET: 2SJ12 or 2SJ13

___ ♦ **CLOSE** Charging Discharge Isolation Valves: 2CV68 or 2CV69

___ B. IF BIT flowpath and Charging Pump is NOT available,
AND a Safety Injection Pump with a Cold Leg Injection path is available,
THEN **ALIGN** feed path to the RCS as follows:

___ 1. **ENSURE** OPEN RWST TO SI PUMP valves:

___ ♦ **PLACE** 2RP4 lockout switch in VALVE OPERATE AND **OPEN** 2SJ30, RWST TO SI PUMPS STOP VALVE

___ ♦ 21SJ33 OR 22SJ33, SI PUMP SUCT VALVE, associated with the available SI Pump

___ ♦ 2SJ67 AND 2SJ68, SI PMP RECIRC VALVES

___ 2. IF both Safety Injection Pumps are tagged out,
THEN **SEND** Operator to release breaker for one Safety Injection Pumps.

S2.OP-AB.RHR-0001(Q)

ATTACHMENT 8
(Page 3 of 8)

COLD LEG INJECTION

1.0 (continued)

CAUTION
___ When the PS25 is the vent path, maximum flow of <300 gpm is required when steam generator nozzle dams are installed. This may be controlled by throttling the pump discharge valve.

___ 3. **START** the designated available Safety Injection Pump AND **FEED** at maximum rate by aligning the following valves in the Cold Leg Injection flow path:

___ ♦ **OPEN** 21SJ134 or 22SJ134, SI PMP TO COLD LEGS, associated with the available SI Pump

___ ♦ **PLACE** 2RP4 lockout switch in VALVE OPERATE AND **OPEN** 2SJ135

___ ♦ **CLOSE** 2SJ67 and 2SJ68, SI PMP RECIRC VALVES

___ C. **CONTINUE** feeding RCS at maximum rate until one of the following occurs:

___ 1. RHR is restored.

___ 2. Pressurizer level is ≥50% cold calibration.

___ 3. Flow from any RCS opening is adequate to result in lowering Core Exit Thermocouple temperatures.

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __21___ Date _____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-13-20

SME/Instructor: R. Moore Date: 1-13-20

SME/Instructor: J. Klein Date: 1-13-20

INITIAL CONDITIONS:

- Unit 2 is in Mode 5 following a 30 day refueling outage.
- The RCS is depressurized **AND** vented using 2PS59 as the approved vent path.
- The Containment Equipment Hatch is CLOSED.
- The crew is performing S2.OP-IO.ZZ-0002, Cold Shutdown to Hot Standby.

Plant conditions are as follows:

- PZR level is 30%
- 21 Charging Pump in service
- 21 and 22 SI Pumps are C/T
- 22 Charging Pump is C/T
- RHR Letdown Booster Pump in service with 2CV8 throttled
- RCS temperature is 149 °F at the RHR Inlet.
- 22 RHR Pump is aligned for Shutdown Cooling

INITIATING CUE:

- You are the Reactor Operator.
- The in-service RHR pump (21 RHR Pump) providing shutdown cooling has just tripped due to an electrical fault on the motor.
- **INITIATE** S2.OP-AB.RHR-0001, Loss of RHR.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: N0010070101

JPM NUMBER: 19-01 NRC Sim-c

ALTERNATE PATH: [X]

K/A NUMBER: 001 A2.11

IMPORTANCE FACTOR: 4.4 (RO) 4.7 (SRO)

APPLICABILITY:

EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-ST.RCS-0001 Rev. 23 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 15 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-13-20**
Validated By:	**Moore / Weidner** **SME or Instructor**	**Date: 1-13-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-c

Rev #	Date	Description	Validation Required
00	8-13-19	**Modified JPM**. Added Alternate Path for continuous rod motion when rod bank selected to Auto or Manual requiring operator to Manually trip the reactor. 001 K/A A2.11: Ability to (a) predict the impacts of the following malfunction or operation on the CRDS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: situations requiring a reactor trip	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: 1150070501

SIMULATOR IC: IC-203

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	RD0045, Uncontrolled Rod Insert in Auto	N/A	N/A	N/A	ET-1	TRUE
02						

3. These malfunctions will simulate failure of rod control system when rods are selected to Auto or Manual (Alt Path) resulting in continuous rod insertion. The operator will mitigate the event by manually tripping the reactor.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01	KB433W1D, Rod Bank Selector Sw in Auto				ET-1	ON
02						
03						
04						

EVENT TRIGGERS:

ET#	Description	Command
1	KB433W1D, Rod bank Selector SW to Auto	

SPECIAL INSTRUCTIONS:

- Rod bank selector switch selected to **CBC position**
- **Ensure** ARPI screen is up on P-250.
- For efficiency, provide the procedures to the operators up front to allow time to read and review.

NAME: _____

DATE: _____

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

TASK NUMBER: 1150070501

INITIAL CONDITIONS:

- Unit 2 is at 100% power BOL.
- No major equipment is out of service and no Tech Specs are active.
- The rod control system surveillance is in progress with the only remaining rod bank to test is Control Bank D.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to complete the rod control system surveillance IAW S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control Power Cabinets (Relay Room)
- CRS directs that 15 steps of rod insertion will be performed to ensure each rod moves at least 10 steps.
- Pre-Test D bank rod positions were recorded and attached with your Cue Sheet.
- Notify the CRS when the testing is complete.
- Your evaluator will take care of all alarms not related to your task.

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. **Correctly performs rod control surveillance using approved procedure**
2. **Responds to continuous rod movement by manually tripping the reactor.**

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		♦ **ENSURE** marked up copy of S2.OP-ST.RCS-0001 is open and marked up on console. ♦ Provide copy of OP-AP-300-1001, PWR Control Rod Movement Requirements.			
		Operator reads and reviews procedures prior to start.	Operator reads P&Ls and reviews OP-AP-300-1001 prior to start		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.1.10	A. IF the reactor is critical, THEN **ENSURE** TAVG is within ±1°F of TREF.	Operator checks Tave/Tref recorder on 2RP4 and determines Tavg is within +/-1 F of Tref.		
*	5.1.10.B	B. **PLACE** Bank Selector Switch in the "CBD" position.	**Operator rotates selector switch clockwise to the CBD position**		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.10.C	C. **ENSURE** GRP. SELECT "B" lights are illuminated on Rod Control System Power Cabinets 21BD and 22BD.	Contacts Maint Technician at Power Cabinets**.** **CUE**: *Technician reports GRP SELECT 'B' lights are illuminated on Cabinets 21 BD and 22BD*.		
*	5.1.10.D	D. **MANEUVER** Control Bank **D** at least 10 steps in any one direction.	**Operator inserts Control Bank D 15 steps.**		
	5.1.10.E	E. **ENSURE** each rod in Control Bank **D** indicated rod movement of at least 10 steps.	**Evaluator's Note:** Operator may request to insert rods additional steps, IF so, just restate the request. Operator monitors rod position on P-250 and determines D bank rods all moved at least 10 steps. **Optional CUE**: *Reactor Engineer reports rods indicate 10 step movement.*		
*	5.1.10.F	F. **RECORD** CONTROL BANK **D** "Test Results" by initialing the SAT or UNSAT column using the Acceptance Criteria in Attachment 1, Rod Control Assembly Data.	**Operator records test results as SAT.**		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.10.G	G. **RESTORE** Control Bank **D** to the pre-test position.	**Operator withdraws Bank D to previous position (ARO)**		
	5.1.11	**ALIGN** the Rod Control System as follows:			
		ALTERNATE PATH STARTS HERE:	**Continuous rod movement when rod bank is selected to Auto or Manual**		
	5.1.11.A	A. IF the reactor is critical, THEN **ENSURE** TAVG is within ±1°F of TREF.	Operator checks Tave/Tref recorder on 2RP4 and determines Tavg is within 1 F of Tref**.**		
	5.1.11.B	B. IF Turbine Power is ≤15%, THEN **PLACE** Bank Selector Switch in the "MAN" position. **Simulator Operator**: **ENSURE ET-1** is TRUE when rods selected to Auto. This will insert **MALF: RD0045, Uncontrolled Rod Insertion in AUTO AND MANUAL.**	N/A		

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.11.C	C. IF Turbine Power is >15%, THEN **PLACE** Bank Selector Switch in the "AUTO" OR "MAN" position as directed by the SM/CRS.	**CUE:** IF asked, *CRS directs rod bank selected to AUTO*. Operator determines that Rx power is > 15% and rotates selector switch counterclockwise to the AUTO position. Operator announces that rods are stepping in and no runback in progress. **CUE:** IF operator recommends to CRS to place rods in Manual, THEN state; ***understand placing rods to manual.*** Operator places rod bank switch to Manual and reports rod motion has NOT stopped. **Operator Manually trips the Reactor.** **JPM Complete once Reactor is Tripped.**		
		Examiner's Note: **The operator may refer to S2.OP-AB.ROD-0003, Continuous Rod Motion and take the actions in the AB to manually trip the reactor.**			

SYSTEM: Reactivity Control (SF-1) – Control Rod Drive System (CRDS)

TASK: Perform Control Rod System Surveillance IAW S2.OP-ST.RCS-0001

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate the JPM when Reactor is tripped.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC Sim-c

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __23___ Date ____1-13-20_____

RC 9. Pilot test the JPM:
   a. verify cues both verbal and visual are free of conflict, and
   b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-13-20
SME/Instructor:	R. Moore	Date:	1-13-20
SME/Instructor:	Z. Weidner	Date:	1-13-20

INITIAL CONDITIONS:

- Unit 2 is at 100% power BOL.
- No major equipment is out of service and no Tech Specs are active.
- The rod control system surveillance is in progress with the only remaining rod bank to test is Control Bank D.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to complete the rod control system surveillance IAW S2.OP-ST.RCS-0001, Reactivity Control System Rod Control Assemblies.
- A Maintenance Technician is stationed at the Rod Control Power Cabinets (Relay Room)
- CRS directs that 15 steps of rod insertion will be performed to ensure each rod moves at least 10 steps.
- Pre-Test D bank rod positions were recorded and attached with your Cue Sheet.
- Notify the CRS when the testing is complete.
- Your evaluator will take care of all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

TASK NUMBER: N0060040101

JPM NUMBER: 19-01 NRC Sim-d

ALTERNATE PATH: [ ]

K/A NUMBER: 006 A4.07

IMPORTANCE FACTOR: 4.4 (RO) 4.4 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-SO.SJ-0002, Rev. 24 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 1-13-20**

Validated By: **Moore / Klein** **SME or Instructor** **Date: 1-13-20**

Approved By: **N/A** **Training Department** **Date:**

Approved By: **N/A** **Operations Department** **Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE
REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-d

Rev #	Date	Description	Validation Required
00	8-15-19	006 K/A A4.07: Ability to manually operate and/or monitor in the control room: ECCS pumps and valves	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

TASK NUMBER: N0060040101

SIMULATOR IC: IC-203

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01						

3. No malfunctions are required for this JPM. Setup IC with 21 SI Accumulator level approx. 56%.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01						

EVENT TRIGGERS:

ET#	Description	Command
1		
2		
3		
4		

SPECIAL INSTRUCTIONS:

- Additional instructor to assist in silencing alarms following reactor trip.

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

TASK NUMBER: N0060040101

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.

INITIATING CUE:

- You are the Reactor Operator.
- **RAISE** level in 21 SI Accumulator Tank to at least 60% IAW IAW Section 5.2 of S2.OP-SO.SJ-0002, Accumulator Operations, using 21 SI pump.
- Your evaluator will respond to all alarms not related to your task.

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. Raises level in 21 SI Accumulator to at least 60% or as directed IAW S2.OP-SO.SJ-0002.

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.2	**Accumulator Make-up using 21 Safety Injection Pump with RCS Temperature >312°F OR the Reactor Vessel Head is Removed**			
	5.2.1	**ENSURE** either of the following conditions exist: • ALL RCS Cold Leg Temperatures >312°F OR • The Reactor Vessel Head is Removed.	Operator determines RCS Cold Leg temperatures are > 312 F and continues on.		
	NOTE	**CAUTION** Closing 21SJ134 may require entry into TSAS 3.5.2.	Operator reads note and continues on.		

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.2	IF RCS pressure is <2000 psig, THEN **ENSURE** CLOSED 21SJ134, COLD LEG DISCHARGE	Operators determines RCS is > 2000 psig and marks step as N/A.		
	NOTE	**CAUTION** A maximum of one Safety Injection Pump OR one Centrifugal Charging Pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is #312°F. This restriction also applies in Modes 5-6 when the head is on the reactor vessel.	Operator reads note and continues on.		
*	5.2.3	**START** 21 Safety Injection Pump.	**Operator depresses the START pushbutton for 21 SI Pump.**		
*	5.2.4	**OPEN** 2SJ53, 21 SI PUMP DISCHARGE TEST LINE VALVE.	**Operator depresses the OPEN pushbutton for 2SJ53.**		
*	5.2.5	**OPEN** 2SJ123, TEST LINE TO CVCS HUT.	**Operator depresses the OPEN pushbutton for 2SJ123.**		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	NOTE	**CAUTION** Do NOT cross-tie Accumulators at any time OPERABILITY is required (e.g.; filling, draining, venting or pressurizing more than one Accumulator at a time).	Operator reads note and continues on.		
*	5.2.6	**OPEN** associated Accumulator fill valve: ___ 21SJ20, ACCUM FILL ___ 22SJ20, ACCUM FILL ___ 23SJ20, ACCUM FILL ___ 24SJ20, ACCUM FILL	**Operator depresses the OPEN pushbutton for 21SJ20.**		
*	5.2.7	When desired level is reached, **CLOSE** the associated Accumulator fill valve: ___ 21SJ20, ACCUM FILL ___ 22SJ20, ACCUM FILL ___ 23SJ20, ACCUM FILL ___ 24SJ20, ACCUM FILL.	**Operator depresses the CLOSE pushbutton for 21SJ20 WHEN level is at least 60% or greater.** **Optional CUE:** *Level is 60%*		
	5.2.8	If required, **REPEAT** Steps 5.2.6 and 5.2.7 to fill additional Accumulators.	Operator marks as N/A		

NAME: _____

DATE: _____

SYSTEM: Emergency Core Cooling System

TASK: Raise Level in 21 SI Accumulator IAW S2.OP-SO.SJ-0002

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	5.2.9	**CLOSE** 2SJ53	Operator depresses CLOSE pushbutton for 2SJ53		
	5.2.10	**CLOSE** 2SJ123	Operator depresses CLOSE pushbutton for 2SJ123.		
	5.2.11	**STOP** 21 Safety Injection Pump.	Operator depresses STOP pushbutton for 21 SI Pump. **CUE: JPM is Complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator stops 21 SI Pump.**		

S2.OP-SO.SJ-0002:

5.2 **Accumulator Make-up using 21 Safety Injection Pump with RCS Temperature >312°F OR the Reactor Vessel Head is Removed**

___ 5.2.1 **ENSURE** either of the following conditions exist:

- ALL RCS Cold Leg Temperatures >312°F

  OR

- The Reactor Vessel Head is Removed.

CAUTION
___ Closing 21SJ134 may require entry into TSAS 3.5.2.

___ 5.2.2 IF RCS pressure is <2000 psig,
THEN **ENSURE** CLOSED 21SJ134, COLD LEG DISCHARGE.

CAUTION [C0575]
___ A maximum of one Safety Injection Pump OR one Centrifugal Charging Pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is ≤312°F. This restriction also applies in Modes 5-6 when the head is on the reactor vessel.

___ 5.2.3 **START** 21 Safety Injection Pump.

___ 5.2.4 **OPEN** 2SJ53, 21 SI PUMP DISCHARGE TEST LINE VALVE.

___ 5.2.5 **OPEN** 2SJ123, TEST LINE TO CVCS HUT.

CAUTION
___ Do NOT cross-tie Accumulators at any time OPERABILITY is required (e.g.; filling, draining, venting or pressurizing more than one Accumulator at a time).

___ 5.2.6 **OPEN** associated Accumulator fill valve:

- ___ 21SJ20, ACCUM FILL
- ___ 22SJ20, ACCUM FILL
- ___ 23SJ20, ACCUM FILL
- ___ 24SJ20, ACCUM FILL

___ 5.2.7 When desired level is reached, **CLOSE** the associated Accumulator fill valve:

___ ♦ 21SJ20, ACCUM FILL

___ ♦ 22SJ20, ACCUM FILL

___ ♦ 23SJ20, ACCUM FILL

___ ♦ 24SJ20, ACCUM FILL.

___ 5.2.8 If required, **REPEAT** Steps 5.2.6 and 5.2.7 to fill additional Accumulators.

___ 5.2.9 **CLOSE** 2SJ53.

___ 5.2.10 **CLOSE** 2SJ123.

___ 5.2.11 **STOP** 21 Safety Injection Pump.

___ 5.2.12 IF in Modes 1, 2, or 3 AND 21SJ134 was CLOSED in Step 5.2.2,
THEN **OPEN** 21SJ134.

___ 5.2.13 If required, **BLEED** off the SI Pump discharge pressure by performing the following:

___ A. **OPEN** 2SJ123, TEST LINE TO CVCS HUT.

___ B. **OPEN** 2SJ60, TEST LINE TO CVCS HUT.

___ C. **OPEN** 2SJ158, SI HEADER COMMON DISCH.

___ D. When 2SJ158 is open for at least 30 seconds
OR PI923 and PI919 pressure decreases to 30-50 psig:

___ 1. **CLOSE** 2SJ158.

___ 2. **CLOSE** 2SJ60.

___ 3. **CLOSE** 2SJ123.

___ 5.2.14 Direct a second Operator to **PERFORM** Independent Verification IAW Attachment 1, Section 2.0.

___ 5.2.15 IF TSAS 3.5.2 was entered,
THEN **REVIEW** continued applicability of this Action Statement.

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __24___ Date ____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor	R. Chan	Date:	1-13-20
SME/Instructor:	R. Moore	Date:	1-13-20
SME/Instructor:	J. Klein	Date:	1-13-20

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.

INITIATING CUE:

- You are the Reactor Operator.
- **RAISE** level in 21 SI Accumulator Tank to at least 60% IAW IAW Section 5.2 of S2.OP-SO.SJ-0002, Accumulator Operations, using 21 SI pump.
- Your evaluator will respond to all alarms not related to your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1 During a LOCA

TASK NUMBER: N1150500502

JPM NUMBER: 19-01 NRC Sim-e

ALTERNATE PATH: [X]

K/A NUMBER: 026 A4.01

IMPORTANCE FACTOR:	4.5	4.3
	RO	**SRO**

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-TRIP-1, Rev. 33 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 Minutes

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-13-20**
Validated By:	**Moore / Klein** **SME or Instructor**	**Date: 1-13-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Representative**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-e

Rev #	Date	Description	Validation Required
00	5-30-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	4-16-18	Corrected minor editorial errors and added Figure 1 to provide snapshot of EOP section used during JPM and added improved malfunctions table.	Yes
02	9-17-19	**MODIFIED** JPM to add 2CS16 and 2CS17 NaOH valves fail to open.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

TASK NUMBER: N1150500502

SIMULATOR IC: **IC-204**

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	RC0001A, RCS Rupture of RC Loop 21	N/A	N/A	N/A	N/A	N/A
02	VL0087, 2CC131 Fails to Position	N/A	N/A	N/A	N/A	100
03	VL0056, 2CC190 Fails to Position	N/A	N/A	N/A	N/A	100
04	RP0277A, Auto CS fails to actuate	N/A	N/A	N/A	N/A	N/A
05	RP0277B, Auto CS fails to actuate	N/A	N/A	N/A	N/A	N/A
06	RP0276A, Auto Phase B fails to actuate	N/A	N/A	N/A	N/A	N/A
07	RP0276B, Auto Phase B fails to actuate	N/A	N/A	N/A	N/A	N/A
08	VL0013, 2CS16 fails to position	N/A	N/A	N/A	N/A	0
09	VL0014, 2CS17 fails to position	N/A	N/A	N/A	N/A	0

3. These malfunctions will simulate failure of CS to actuate. The operator will be required to manually actuate Phase B and CS using key switches. [**Alternate Path**] The operator will recognize that not all Phase B/CS valves are in their safeguards positions. The operator will manually reposition the valves to their safeguards position (closes 2CC131 and 2CC190, opens 2CS16 and 2CS17).

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

EVENT TRIGGERS:

ET#	Description	Command
1	KA617TCM, 2CC131 Closed PB	DMF VL0087
2	KA618TCM. 2CC190 Closed PB	DMF VL0056
3	KA404PNT, 2CS16 Open PB	DMF VL0013
4	KA406PNT, 2CS17 Open PB	DMF VL0014

SPECIAL INSTRUCTIONS: None

NAME: _____

DATE: _____

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1

TASK NUMBER: N1150500502

INITIAL CONDITIONS:

- A Large Break LOCA has occurred.
- The Reactor Automatically Tripped and SI was actuated
- The crew has completed Steps 1 through 10 of 2-EOP-TRIP-1, Rx Trip or Safety Injection.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to continue on with EOP-TRIP-1 starting at **STEP 11**.
- Your evaluator will respond to any alarms not associated with your task.

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. Manually initiates Containment Spray using key switches.
3. Closes 2CC131 OR 2CC190 Phase B valves.
4. Opens 2CS16 OR 2CS17 NaOH Discharge Valves

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1 During a LOCA

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		The following steps are from 2-EOP-TRIP-1, Major Action for "Containment Spray Actuation Verification", Step 11. **Examiner's Note: Figure 1 is a snapshot that shows the exact EOP steps to follow along.**	**Evaluator's Note**: The following EOP CAS actions were already implemented: ♦ STOP RCPs ♦ CLOSE charging pump mini flows		
	Step 11	Has Containment Pressure remained less than 15 psig	**NO**, Operator determines containment pressure has NOT remained less than 15 psig.		
*	Step 11	Initiate Phase B and Spray Actuation	**Operator uses both Safeguards Keys and simultaneously rotates both keys on 2CC1 to actuate Phase B and Spray Actuation on at least one Safeguards train.** **Examiner's Note:** Operator can use one key at a time so long as the key switch is not rotated back to the initial position prior to removing the key.		
	Step 11.2	Did any available CNMT Spray pump fail to start	No, Operator determines that both CS pumps are running.		

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1 During a LOCA

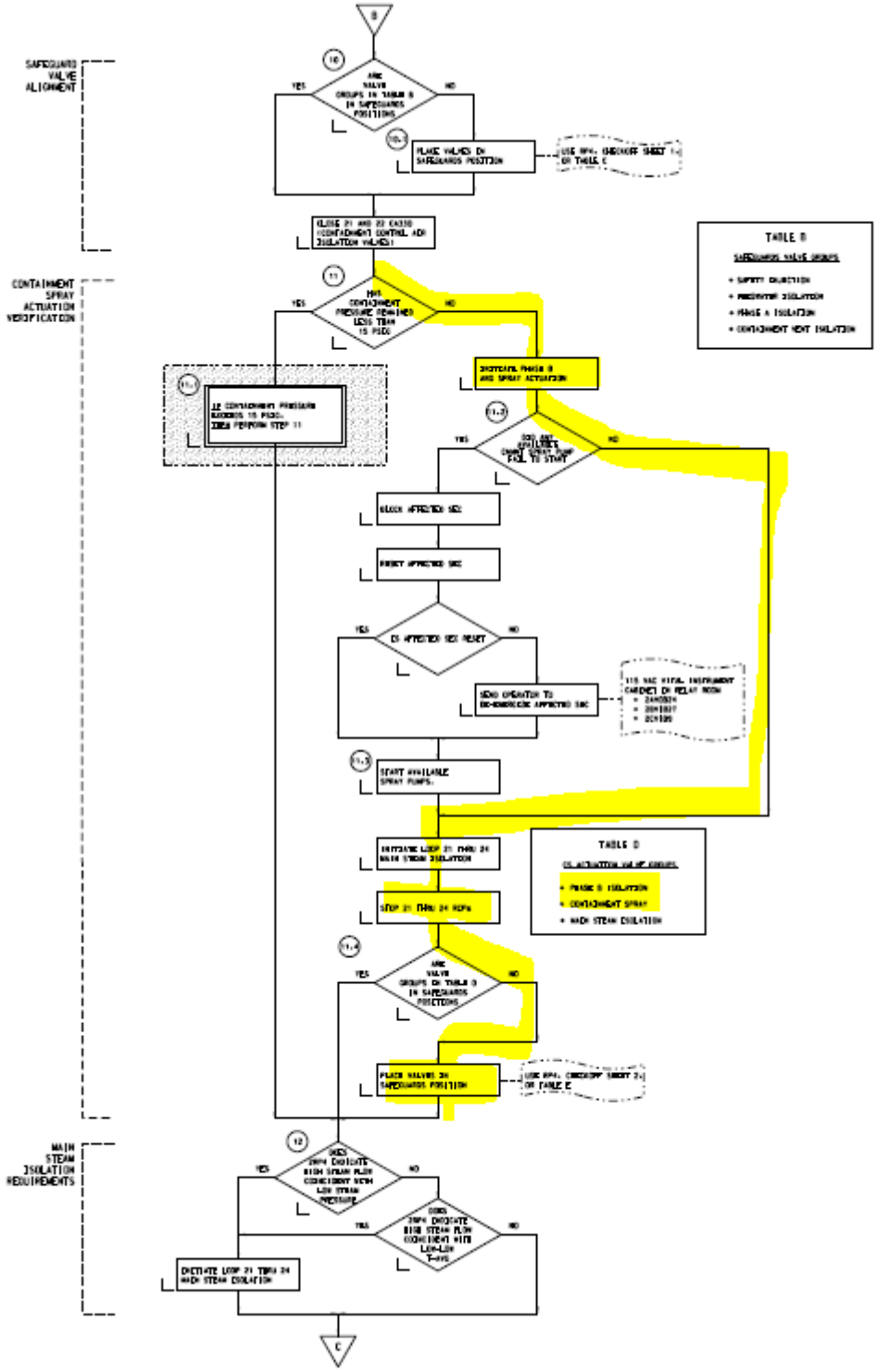
* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	Step 11.3	Initiate Loop 21 thru 24 Main Steam Isolation	Determines Loops 21 thru 24 Main Steam Isolation previously actuated. (From hi-hi containment pressure signal)		
	Step 11.3	Stop 21 thru 24 RCPs	Operator reports 21-24 RCPs are stopped.		
		ALTERNATE PATH STARTS HERE:	**2CC131 and 2CC190 failed to close on Phase B AND 2CS16 and 2CS17 fail to open on CS signal.**		
	Step 11.4	Are valve groups in Table D in Safeguards positions	NO, operator identifies that 2CC131 and 2CC190 remain OPEN AND 2CS16 and 2CS17 remain CLOSED.		
*	Step 11.4	Place Valves in Safeguards position **Simulator Operator**: **ENSURE** the following Event Triggers are TRUE, this will delete the following malfunctions to enable the valves to reposition: **ET-1: VL0013 for 2CS16** **ET-2: VL0014 for 2CS17** **ET-3: VL0087 for 2CC131** **ET-4: VL0056 for 2CC190**	**Operator depresses CLOSED pushbutton for 2CC131 and 2CC190 and verifies CLOSED bezel are illuminated.** **Operator depresses the OPEN pushbutton for 2CS16 and 2CS17 and verifies OPEN bezel are illuminated.** **CUE: JPM is Complete** **Examiner's Note:** Selecting Manual for 2CC131 is NOT required to close the valve.		

SYSTEM: Containment Spray System

TASK: Manually Initiate Containment Spray and Open Phase B Valves in EOP-TRIP-1 During a LOCA

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator repositions Phase B/CS valves of EOP-TRIP-1.**		

Figure 1 (EOP-TRIP-1, Sheet 2):



JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC Sim-e

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __33___ Date _____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-13-20

SME/Instructor: R. Moore Date: 1-13-20

SME/Instructor: J. Klein Date: 1-13-20

INITIAL CONDITIONS:

- A Large Break LOCA has occurred.
- The Reactor Automatically Tripped and SI was actuated
- The crew has completed Steps 1 through 10 of 2-EOP-TRIP-1, Rx Trip or Safety Injection.

INITIATING CUE:

- You are the Reactor Operator.
- The CRS directs you to continue on with EOP-TRIP-1 starting at **STEP 11**.
- Your evaluator will respond to any alarms not associated with your task.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

TASK NUMBER: N1140230401

JPM NUMBER: 19-01 NRC Sim-f

ALTERNATE PATH: [ ]

K/A NUMBER: 015 A4.03

IMPORTANCE FACTOR: 3.8 (RO) 3.9 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [ ]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-SO.RPS-0001, Rev. 6 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 8 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Instructor** **Date: 1-13-20**

Validated By: **Moore / Klein** **SME or Instructor** **Date: 1-13-20**

Approved By: **N/A** **Training Department** **Date:**

Approved By: **N/A** **Operations Department** **Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE
REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-f

Rev #	Date	Description	Validation Required
00	9-17-19	015 K/A A4.03: Ability to manually operate and/or monitor in the control room: Trip bypasses	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

TASK NUMBER: N1140230401

SIMULATOR IC: IC-205

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	NI0193A, PR CH N41 Fails H/L	N/A	N/A	N/A	N/A	200

3. This malfunction will simulate a power range NIS channel failing high. The JPM will require the operator to remove the channel from service IAW S2.OP-SO.RPS-0001.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01						

EVENT TRIGGERS:

ET#	Description	Command
1		
2		
3		
4		

SPECIAL INSTRUCTIONS:

- None.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

TASK NUMBER: N1140230401

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.
- Power Range NIS Channel 2N41 has failed high.
- The crew has placed rod control in Manual and performed all the required actions in S2.OP-AB.NIS-0001, Nuclear Instrumentation System Malfunction.
- The following OHA Alarms are lit:
  - E-15, PR HI RNG FLUX HI
  - E-31, PR OVRPWR ROD STOP
  - E-39, PR CH DEV
  - E-47, PR NEUT FLUX RATE HI

INITIATING CUE:

- You are the Plant Operator.
- **REMOVE** the failed 2N41 Channel from service IAW **S2.OP-SO.RPS-0001**, Nuclear Instrumentation Channel Trip/Restoration (**see attached pages**).

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. Removes 2N41 Channel from service by performing Steps 5.1.5.A thru 5.1.5.E correctly IAW S2.OP-SO.RPS-0001.

NAME: _____

DATE: _____

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.1	**Placing 2N41 Power Range NI in Tripped Condition IAW S2.OP-SO.RPS-0001**			
	5.1.1	**ENSURE** that tripping of associated bistable(s) will NOT result in an ESF OR RPS actuation	Operator checks 2RP4 panel and ensures tripping bistable will not result in Rx Trip.		
	5.1.2	**ENSURE** 2N41 Channel is NOT selected on NIS Recorder 2NR45	Operator checks 2N41 recorder and ensures not selected on 2N41 recorder.		
	5.1.3	**ENSURE** Rod Control is in Manual	Operator verifies rod control is in Manual.		
	5.1.4	**ENTER** T/S 3.3.1.1, Reactor Trip System Instrumentation for 2N41.	**CUE**: CRS will enter Tech Spec 3.3.1.1 for 2N41.		
		NOTE Steps 5.1.5 through 5.1.7 may be performed in any order	Operator reads note and continues on with procedure.		
	5.1.5	At NI Rack No. 81, **PERFORM** the following:	Operator goes to back of control room (simulator).		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.1.5. A	**PLACE** DETECTOR CURRENT COMPARATOR, UPPER SECTION, switch in PRN41 position AND **ENSURE** the following: ___ CHANNEL DEFEAT lamp illuminates. ___ OHA E-38, UPPER SECT DEV ABV 50% PWR, clears.	**Operator places DETECTOR CURRENT COMPARATOR, UPPER SECTION switch to the PRN41 position.** **Operator verifies CHANNEL DEFEAT lamp is lit.** **CUE**: OHA E-38 is clear. **Note:** OHA E-38 was NOT in prior to tripping channel.		
*	5.1.5. B	**PLACE** DETECTOR CURRENT COMPARATOR, LOWER SECTION, switch in PRN41 position AND **ENSURE** the following: ___ CHANNEL DEFEAT lamp illuminates. ___ OHA E-46, LOWER SECT DEV ABV 50% PWR, clears.	**Operator places DETECTOR CURRENT COMPARATOR, LOWER SECTION switch to the PRN41 position.** **Operator verifies CHANNEL DEFEAT lamp is lit.** **CUE:** OHA E-46 is clear. **Note:** OHA E-46 was NOT in prior to tripping channel.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	5.1.5. C	**PLACE** POWER MISMATCH BYPASS switch in BYPASS PR N41. (Defeats input to Rod Control)	**Operator places POWER MISMATCH BYPASS switch in BYPASS PR N41 position.**		
*	5.1.5. D	**PLACE** ROD STOP BYPASS switch in BYPASS PR N41 AND **ENSURE** the following: ___ 2RP4 - OVER POWER ROD STOP MANUAL BYPASS, CH I is illuminated. ___ OHA E-31, PR OVERPWR ROD STOP, is clear.	**Operator places ROD STOP BYPASS switch to BYPASS PR N41 position.** **Operator verifies 2RP4 OVER POWER ROD STOP MANUAL BYPASS, CH I is lit.** **CUE:** OHA E-31 is clear.		
*	5.1.5. E	**PLACE** COMPARATOR CHANNEL DEFEAT switch in N41 AND **ENSURE** the following: ___ COMPARATOR DEFEAT lamp is illuminated. ___ OHA E-39, PR CH DEV, is clear.	**Operator places COMPARATOR CHANNEL DEFEAT switch in N41 position.** **Operator verifies COMPARATOR DEFEAT lamp is lit.** **CUE:** OHA E-39 is clear. **CUE: JPM is Complete**		

NAME: _____

DATE: _____

SYSTEM: Instrumentation

TASK: Remove a Power Range Channel from Service IAW S2.OP-SO.RPS-0001

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes Step 5.1.5.E.**		

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __6___ Date ____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-13-20

SME/Instructor: R. Moore Date: 1-13-20

SME/Instructor: J. Klein Date: 1-13-20

INITIAL CONDITIONS:

- The Unit 2 is operating at 100% power with no major equipment out of service.
- Power Range NIS Channel 2N41 has failed high.
- The crew has placed rod control in Manual and performed all the required actions in S2.OP-AB.NIS-0001, Nuclear Instrumentation System Malfunction.
- The following OHA Alarms are lit:
  - E-15, PR HI RNG FLUX HI
  - E-31, PR OVRPWR ROD STOP
  - E-39, PR CH DEV
  - E-47, PR NEUT FLUX RATE HI

INITIATING CUE:

- You are the Plant Operator.
- **REMOVE** the failed 2N41 Channel from service IAW **S2.OP-SO.RPS-0001**, Nuclear Instrumentation Channel Trip/Restoration (**see attached pages)**.

5.0 PROCEDURE

5.1 Placing 2N41 Power Range NI in Tripped Condition

___ 5.1.1 **ENSURE** that tripping of associated bistable(s) will NOT result in an ESF OR RPS actuation.

___ 5.1.2 **ENSURE** 2N41 Channel is NOT selected on NIS Recorder 2NR45.

___ 5.1.3 **ENSURE** Rod Control is in Manual.

___ 5.1.4 **ENTER** T/S 3.3.1.1, Reactor Trip System Instrumentation for 2N41.

NOTE
___ Steps 5.1.5 through 5.1.7 may be performed in any order.

___ 5.1.5 At NI Rack No. 81, **PERFORM** the following:

___ A. **PLACE** DETECTOR CURRENT COMPARATOR, UPPER SECTION, switch in PRN41 position AND **ENSURE** the following:

___ ♦ CHANNEL DEFEAT lamp illuminates.

___ ♦ OHA E-38, UPPER SECT DEV ABV 50% PWR, clears.

___ B. **PLACE** DETECTOR CURRENT COMPARATOR, LOWER SECTION, switch in PRN41 position AND **ENSURE** the following:

___ ♦ CHANNEL DEFEAT lamp illuminates.

___ ♦ OHA E-46, LOWER SECT DEV ABV 50% PWR, clears.

___ C. **PLACE** POWER MISMATCH BYPASS switch in BYPASS PR N41. (Defeats input to Rod Control)

___ D. **PLACE** ROD STOP BYPASS switch in BYPASS PR N41 AND **ENSURE** the following:

___ ♦ 2RP4 - OVER POWER ROD STOP MANUAL BYPASS, CH I is illuminated.

___ ♦ OHA E-31, PR OVERPWR ROD STOP, is clear.

(step continued on next page)

5.1.5 Continued

___ E. **PLACE** COMPARATOR CHANNEL DEFEAT switch in N41 AND **ENSURE** the following:

___ ♦ COMPARATOR DEFEAT lamp is illuminated.

___ ♦ OHA E-39, PR CH DEV, is clear.

___ 5.1.6 At bottom section of Control Rack No. 26, **PLACE** AXIAL FLUX DIFF MONITOR INPUT TEST SWITCH 1 in TEST position.

___ 5.1.7 **PLACE** 2N41 Channel bistables in the tripped condition as follows:

___ A. **OPEN** front door of RACK NO. 2 PROTECTION CH SET I.

___ B. **ENSURE** OHA A-4, RX PROT CH I ON TEST, is illuminated.

___ C. **PLACE** the following bistable test switches in the test (up) position AND **ENSURE** associated alarms and status indications are illuminated:

___ ♦ 2BS-411C

___ ● 2RP4 - OVER TEMPERATURE ΔT, CH I

___ ● 2CC2 - 1/4 OT D/T RX TRIP SETPOINT

___ ♦ 2BS-411D

___ ● 2RP4 - OVER TEMPERATURE ΔT, CH I.

___ ● 2CC2 - OT D/T ROD BLOCK & TURBINE RUNBACK

___ 5.1.8 At POWER RANGE A, N41A Drawer front panel, **REMOVE** both 118V, 5A, AC CONTROL POWER fuses, AND **ENSURE** CONTROL POWER ON lamp is extinguished.

___ 5.1.9 IF active troubleshooting will NOT be performed within 8 hours, OR a power decrease below 10% is planned, OR CRS/SM determines lead lift AND jumper installation is necessary, THEN Direct Maintenance to **COMPLETE** Attachment 1, Section 1.0. **[C0178]**

___ 5.1.10 IF leads were lifted, OR jumpers installed IAW Attachment 1, THEN RECORD Status in Tech Spec Log.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

TASK NUMBER: N1150190501

JPM NUMBER: 19-01 NRC Sim-g

ALTERNATE PATH: [ ]

K/A NUMBER: 039 A4.07

IMPORTANCE FACTOR:	2.8*	2.9
	RO	**SRO**

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: 2-EOP-SGTR-1, Rev. 32 (checked 1-13-20)

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 5 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R. Chan** **Date: 1-13-20**
Instructor

Validated By: **Moore / Klein** **Date: 1-13-20**
SME or Instructor

Approved By: **N/A** **Date:**
Training Department

Approved By: **N/A** **Date:**
Operations Department

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY: _____

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE
REVISION HISTORY

JPM NUMBER: 19-01 NRC Sim-g

Rev #	Date	Description	Validation Required
00	9-18-19	039 K/A A4.03: Ability to manually operate and/or monitor in the control room: Steam dump valves	Yes

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

TASK NUMBER: N1150190501

SIMULATOR IC: IC-206

MALFUNCTIONS:

1. Reset the simulator to the above IC #.
2. Verify the following events on the Summary/ET Trigger Lists:

MALF ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
01	SG0078D, 24 SG Tube Rupture	N/A	N/A	N/A	N/A	650
02	MS0093 Loss of S/D Vac Permissive					TRUE

3. This malfunction will simulate a steam generator tube rupture on 24 SG. The JPM will require the operator to perform RCS cooldown using MS10s on intact SGs IAW Step 10 of EOP-SGTR-1.

OVERRIDES / REMOTES:

ID #	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
01						

EVENT TRIGGERS:

ET#	Description	Command
1		
2		
3		
4		

SPECIAL INSTRUCTIONS:

- None.

NAME: _____

DATE: _____

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

TASK NUMBER: N1150190501

INITIAL CONDITIONS:

- The Unit 2 Reactor was manually tripped and Safety Injection was actuated due to a verified Steam Generator Tube Rupture on 24 Steam Generator.
- All required actions in EOP-TRIP-1 are complete.
- The crew is currently implementing EOP-SGTR-1, Steam Generator Tube Rupture, and all steps up to Step 9 are complete.
- Steam Dump Permissive light on 2RP4 is NOT illuminated due to an instrumentation failure. Steam Dumps are NOT available.

INITIATING CUE:

- You are the Plant Operator.
- The CRS DIRECTS you to **PERFORM** an RCS Cooldown starting at Step 10 of 2-EOP-SGTR-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. Correctly implements the steps of EOP-SGTR-1 to cooldown the RCS using MS10s to the required temperature of 503 F.

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		2-EOP-SGTR-1 Sheet 2, STEP 10			
*	10	DETERMINE REQUIRED RCS TEMP USING TABLE B	**Operator uses Table B and determines required RCS temperature based on current ruptured 24 SG pressure (approx. 1045 psi) is <u>503 F</u>.**		
	10.1	IS INTACT SG AVAILABLE FOR COOLDOWN	Yes, Operator determines 3 intact SGs are available for cooldown.		
	10.2	ARE CONDENSER STEAM DUMPS AVAILABLE	NO, Operator determines steam dumps are NOT available.		
*		DUMP STEAM AT MAXIMUM RATE USING INTACT SG MS10s.	**Operator LOWERs setpoint on all <u>intact</u> SGs until each MS10 is fully open.**		

NAME: _____

DATE: _____

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
	10.5	IS HOTTEST CET LESS THAN RCS COOLDOWN TEMP	No.		
	10.8	WHEN HOTTEST CET LESS THAN REQUIRED RCS COOLDOWN TEMP THEN DO STEPS 10.6 AND 10.7	**CUE**: **The crew will continue on with SGTR-1, CRS directs you to monitor the RCS cooldown**. Operator WAITs until required CET temperature is reached. **Examiner's Note**: It will take approx. **6-8 minutes** to reach target CET temperature. **Examiners Note**: The operator may adjust AFW flows to intact SGs prior to or during the cooldown as necessary. **Optional CUE**: At Lead Examiner's discretion, the following cue may be used: ***hottest CETs are now indicating less than your target temperature***.		

OPERATIONS TRAINING PROGRAM

JOB PERFORMANCE MEASURE

NAME: _____

DATE: _____

SYSTEM: Secondary System

TASK: Perform RCS Cooldown using MS10s IAW EOP-SGTR-1

* #	STEP No.	STEP (Shaded area denotes Critical Step) (* Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT Evaluation)
*	10.6	STOP COOLDOWN	**Operator adjust each intact SG MS10 setpoint to match current SG pressure.** **CUE: JPM is Complete**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes Step 10.6.**		

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.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __32___ Date ____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-13-20

SME/Instructor: R. Moore Date: 1-13-20

SME/Instructor: J. Klein Date: 1-13-20

INITIAL CONDITIONS:

- The Unit 2 Reactor was manually tripped and Safety Injection was actuated due to a verified Steam Generator Tube Rupture on 24 Steam Generator.
- All required actions in EOP-TRIP-1 are complete.
- The crew is currently implementing EOP-SGTR-1, Steam Generator Tube Rupture, and all steps up to Step 9 are complete.
- Steam Dump Permissive light on 2RP4 is NOT illuminated due to an instrumentation failure. Steam Dumps are NOT available

INITIATING CUE:

- You are the Plant Operator.
- The CRS DIRECTS you to **PERFORM** an RCS Cooldown starting at Step 10 of 2-EOP-SGTR-1.

STATION: SALEM

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

TASK NUMBER: N0620110101

JPM NUMBER: 19-01 NRC Sim-h

ALTERNATE PATH: [X]

K/A NUMBER: 062 A2.04

IMPORTANCE FACTOR: 3.1 (RO) 3.4 (SRO)

APPLICABILITY:

EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: Simulator / Perform

REFERENCES: S2.OP-SO.4KV-0008, Rev. 13 (checked 1-13-20
S2.OP-AR.ZZ-0009, Rev 28

TOOLS AND EQUIPMENT: None

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By: **R Chan** **Date: 1-13-20**
Instructor

Validated By: **Moore / Weidner** **Date: 1-13-20**
SME or Instructor

Approved By: **N/A** **Date:**
Training Department

Approved By: **N/A** **Date:**
Operations Department

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: **SAT** **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 16-01 NRC Sim-h

Rev #	Date	Description	Validation Required
00	9-29-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	Yes
01	12-15-17	Updated to reflect procedure change to S2.OP-SO.4KV-0008, Rev. 13 that corrected a typographical error on P&L 3.3 that could confuse the operator in response to the malfunction.	No

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

TASK NUMBER: N0620110101

SIMULATOR IC: IC-207

MALFUNCTIONS / REMOTES:

1. Reset the simulator to IC-208.
2. Verify the following actions in the Summary/ET Trigger Lists:
   a. **ET-1: KC509PC0 - 2BGGD 2G Group Bus Feeder Close, INSERT MALF: EL0142 - Loss of 2G 4160 V Group Bus.**
3. This malfunction will simulate a loss of the 2G Group Bus only and result in the loss of one (1) RCP (24 RCP). Based on S2.OP-SO.4KV-0008, Precautions and Limitations 3.3, the crew should respond to OHA J-39 when it does NOT clear following bus transfer. The OHA ARP will direct you to J-38 to TRIP the Reactor and GO TO EOP-TRIP-1.
4. Check APT voltage the same as the Group bus voltage pre-req 2.3.3
5. This completes the setup for this JPM.

OVERRIDES: None

SPECIAL INSTRUCTIONS:

- **Provide** marked up hard copy of S2.OP-SO.4KV-0008.
- Setup to only de-energize one (1) Group Bus, THEN the operator will receive OHA J-39, 4KV GRP BUS XFER FAIL.
- The OHA ARP for J-39 will direct operator to J-38 for response.
- The OHA ARP for J-8 will direct operator to D-31 for response.
- OHA J-38 states: IF ANY RCP Trips THEN:
  - TRIP Reactor
  - GO TO EOP-TRIP-1

NAME: _____

DATE: _____

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

TASK NUMBER: N0620110101

INITIAL CONDITIONS:

- Unit 2 power ascension is in progress following refueling outage.
- Reactor power is at 20%.
- The Main Generator is connected to the grid with 190 MWe output.
- Steam Dumps are in Tavg Mode –Auto
- Rod Control is in Manual (D-104) until Group Buses are transferred
- Group Buses are currently powered from the Station Power Transformers (SPT).

INITIATING CUE:

- You are the Plant Operator.
- The CRS directs you to **TRANSFER** all 4KV Group Buses from their respective Station Power Transformers (SPT) to the Aux Power Transformers (APT) IAW S2.OP-SO.4KV-0008, 4KV Group Buses Power Supply Transfer in the **following order**:
    1. 2F IAW section 5.2
    2. 2G IAW section 5.3
    3. 2H IAW section 5.4
    4. 2E IAW section 5.1
- All pre-requisites are completed SAT.

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. Correctly performs the transfer of 2F 4KV Group bus from SPT to APT IAW S2.OP-SO.4KV-0008.
2. Manually trips the Reactor IAW Alarm Response Procedure following the loss of one RCP (24 RCP).

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE	**PROVIDE** a marked copy of S2.OP-SO.4KV-0008 to the operator.			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	P&L	**Examiner's Note**: The operator may also review the OHA ARPs prior to starting the JPM.	Operator reviews Precautions and Limitations. **Examiner's Note**: P&L 3.3 will be applicable when the 2G 4KV Bus de-energizes: When transferring a group Bus from SPT to APT, OHA J-39, GROUP BUS XFER FAIL, will illuminate then clear on bus transfer (expected response). OHA J-39 annunciator response is applicable when the alarm does NOT clear following bus transfer.		
	5.2	**Transferring 2F 4KV Group Bus from 22 SPT to 2 APT**			
	5.2.1	**ENSURE** all Overhead Annunciators for 2 APT are clear.	Checks OHA Windows and determines all Overhead Annunciators for 2 APT are clear.		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.2.2	**ENSURE** 2A APT voltage is 4.22 - 4.36KV.	Checks 2A APT reading on 2CC3 and ensures 2A APT voltage is 4.22 - 4.36KV.		
	5.2.3	IF Auxiliary Power Unit Isolation Transfer is tripped, THEN **RESET** Auxiliary Power Unit Isolation Transfer (UIT).	Determines Auxiliary Power Unit Isolation Transfer is not tripped from control console indication.		
*	5.2.4	**PRESS** the Mimic Bus 2F GROUP BUS INFEED 2BFGD BREAKER pushbutton, AND **ENSURE** console bezel 2BFGD MIMIC BUS INTLK CLOSE SELECTION illuminates.	**Depresses Mimic Bus 2F GROUP BUS INFEED 2BFGD BREAKER pushbutton and verifies console bezel 2BFGD MIMIC BUS INTLK CLOSE SELECTION is Illuminated.**		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.2.5	***PRESS** control console 2BFGD CLOSE pushbutton, AND **ENSURE** the following: A. *22FSD is OPEN. B. *2BFGD is CLOSED. C. *2F 4KV Group Bus voltage is 4.22 - 4.36KV. D. Console bezel 2BFGD MIMIC BUS INTLK CLOSE SELECTION is extinguished.	**Depresses control console 2BFGD CLOSE pushbutton and verifies the following:** A. **22FSD OPEN bezel is illuminated.** B. **2BFGD CLOSED bezel is illuminated.** C. **2F 4KV Group Bus voltage is 4.22 - 4.36KV.** D. Console bezel 2BFGD MIMIC BUS INTLK CLOSE SELECTION is extinguished.		
	5.3	**Transferring 2G 4KV Group Bus from 22 SPT to 2 APT**			
	5.3.1	**ENSURE** all Overhead Annunciators for 2 APT are clear.	Checks OHA Windows and determines all Overhead Annunciators for 2 APT are clear.		
	5.3.2	**ENSURE** 2A APT voltage is 4.22 - 4.36KV.	Checks 2A APT reading on 2CC3 and ensures 2A APT voltage is 4.22 - 4.36KV.		
	5.3.3	IF Auxiliary Power Unit Isolation Transfer is tripped, THEN **RESET** Auxiliary Power Unit Isolation Transfer (UIT).	Determines Auxiliary Power Unit Isolation Transfer is not tripped from control console indication.		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.3.4	**PRESS** Mimic Bus 2G GROUP BUS INFEED 2BGGD BREAKER pushbutton, AND **ENSURE** console bezel 2BGGD MIMIC BUS INTLK CLOSE SELECTION illuminates.	**Depresses Mimic Bus 2G GROUP BUS INFEED 2BGGD BREAKER pushbutton, AND verifies console bezel 2BGGD MIMIC BUS INTLK CLOSE SELECTION is illuminated.**		
		ALTERNATE PATH STARTS HERE:	**2G Bus fails to transfer resulting in de-energized bus and loss of 24 RCP.**		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.3.5	***PRESS** control console 2BGGD CLOSE pushbutton, AND **ENSURE** the following: A. *22GSD is OPEN. B. *2BGGD is CLOSED. C. *2G 4KV Group Bus voltage is 4.22 - 4.36KV. D. Console bezel 2BGGD MIMIC BUS INTLK CLOSE SELECTION is extinguished.	Operator determines 2G 4KV Group bus did not transfer and announces several unexpected OHA alarms. The following OHA alarms are applicable to the loss of 2G 4KV bus and will provide the operator with the required actions: J-8 (2G 4KV GRP BUS DIFF/OVRLD), J-38 (4KV GRP BUS UNDRVOLT), J-39 (4KV GRP BUS XFER FAIL), and D-31 (24 RCP BKR OPEN/FLO LO). **CUE**: If requested to dispatch an operator to inspect the 4KV group Bus, state; ***the CRS will send an operator to investigate***. Operator identifies that OHA ARPs for J-38 or D-31 requires tripping the Reactor and going to EOP-TRIP-1 (OHA response are provided in next steps). **CUE**: If operator informs CRS of action to trip the reactor, state; ***take actions per the alarm response procedure***. **Operator TRIPs the Reactor** .		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	OHA ARP J-8	**2G 4KV GRP BUS DIFF/OVRLD** **3.3 RESPOND** to OHA D-31 for loss of 24 RCP.	IF the operator refers to this ARP, THEN the operator determines that Step 3.3 is applicable and performs the following: Operators responds IAW **OHA D-31** (**GO TO PAGE 11**)		
	OHA ARP J-39	**4KV GRP BUS XFER FAIL** 3.0 **OPERATOR ACTIONS** **GO TO** OHA J-38 response	IF the operator refers to this ARP, THEN is directed to: GOES TO ARP for J-38 for response.		
*	OHA ARP J-38	**4KV GRP BUS UNDRVOLT** **3.0 OPERATOR ACTIONS:** 3.5 IF ANY RCP trips, THEN: A. **TRIP** Reactor B. **GO TO** 2-EOP-TRIP-1	IF the operator refers to this ARP, THEN the operator determines that Step 3.5 is applicable and performs the following: **Operator TRIPs the Reactor.** **CUE: JPM is Complete**		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	OHA ARP D-31	**24 RCP BKR OPEN/FLO LO** **3.0 OPERATOR ACTIONS:** 3.5 IF Reactor Coolant System flow degradation exists, THEN: A. **TRIP** the Reactor B. **STOP** 24 RCP C. IF RCP shutdown was due to RCP Seal Leakoff ≥ 6 gpm, THEN simultaneously **PERFORM** the following: ▪ Between 3-5 minutes after stopping 24 RCP, **CLOSE** 24CV104, SEAL LEAKOFF. ▪ **GO TO** 2-EOP-TRIP-1 **D. GO TO** 2-EOP-TRIP-1	IF the operator refers to this ARP, THEN the operator determines that Step 3.5 is applicable and performs the following: **Operator TRIPs the Reactor**. **CUE: JPM is Complete** Note: Stopping 24 RCP is not required due to the bus de-energizing.		

SYSTEM: A.C. Electrical Distribution

TASK: Transfer 4KV Group Buses To The Alternate Power Supply (SPT to APT)

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	**JPM is Complete** **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate the JPM when the Rx trip has been initiated.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM #: 19-01 NRC Sim-h

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __13___ Date ____1-13-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-13-20

SME/Instructor: R. Moore Date: 1-13-20

SME/Instructor: Z. Weidner Date: 1-13-20

INITIAL CONDITIONS:

- Unit 2 power ascension is in progress following refueling outage.
- Reactor power is at 20%.
- The Main Generator is connected to the grid with 190 MWe output.
- Steam Dumps are in Tavg Mode –Auto
- Rod Control is in Manual (D-104) until Group Buses are transferred
- Group Buses are currently powered from the Station Power Transformers (SPT).

INITIATING CUE:

- You are the Plant Operator.
- The CRS directs you to **TRANSFER** all 4KV Group Buses from their respective Station Power Transformers (SPT) to the Aux Power Transformers (APT) IAW S2.OP-SO.4KV-0008, 4KV Group Buses Power Supply Transfer in the **following order**:
    1. 2F IAW section 5.2
    2. 2G IAW section 5.3
    3. 2H IAW section 5.4
    4. 2E IAW section 5.1
- All pre-requisites are completed SAT.

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Abnormal Plant Evolutions

TASK: Locally Control Charging Flow IAW S2.OP-AB.CR-0001.

TASK NUMBER: 1130070501

JPM NUMBER: 19-01 NRC IP-i

ALTERNATE PATH: [ ]

K/A NUMBER: APE 068 AA1.22

IMPORTANCE FACTOR:	4.0	4.3
	RO	**SRO**

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: In Plant / Simulate

REFERENCES: S2.OP-AB.CR-0001, Rev. 23 (checked 1-15-20)

TOOLS AND EQUIPMENT: JAM Key

VALIDATED JPM COMPLETION TIME: 10 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-15-20**
Validated By:	**Moore / Klein** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 19-01 NRC IP-i

Rev #	Date	Description	Validation Required
00	6-20-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA. Incorporated comments from validation.	No
01	9-18-19	APE 068 AA1.22: Ability to operate and/or monitor the following as they apply to the Control Room Evacuation: Flow control valve for RCS charging header Deleted actions to locally trip the reactor. Added photo of Panel 216 to assist evaluator.	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Abnormal Plant Evolutions

TASK: Locally Control Charging Flow IAW S2.OP-AB.CR-0001.

TASK NUMBER: 1130070501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is located inside the <u>Unit 2</u> RCA.**
- **NOTE: <u>Evaluator must have a JAM key to give to operator at start of JPM. Operators do not have individual JAM keys</u>!**
- **Notification to control room will be required when opening panel door in charging alley.**

NAME: _____

DATE: _____

SYSTEM: Abnormal Plant Evolutions

TASK: Locally Control Charging Flow IAW S2.OP-AB.CR-0001.

TASK NUMBER: 1130070501

INITIAL CONDITIONS:

- The Unit 2 Control Room has been evacuated in accordance with S2.OP-AB.CR-0001, Control Room Evacuation.
- A reactor trip from 100% was initiated prior to evacuating the Control Room.

INITIATING CUE:

- You are directed to take local control of charging flow IAW S2.OP-AB.CR-0001, Control Room Evacuation, Attachment 5, starting at Step 8.0 (**see attached page**).
- Steps 1.0-7.0 of Attachment 5 have been completed.

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. **Locally controls Charging flow using hand air operator IAW S2.OP.AB.CR-0001**
2. **Correctly adjusts air operator to change charging flow to the desired flow of 70 gpm.**

SYSTEM: **Abnormal Plant Evolutions**
TASK: **Locally Control Charging Flow IAW S2.OP-AB.CR-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Evaluator provide blank copy of Attachment 5, **a JAM Key**, and state: "You have a radio and all required keys."			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
			Proceeds to Unit 2 Panel 216-1, Chg Pmps FL & PR Inst Pnl. **Examiner's Note:** Panel 216-1 will cause an alarm in the Control Room when opened. The Control Room must be notified **prior** to opening this panel, and when it is secured.		
	8.0	**TAKE** control of 2CV55, Cent Chg Pmp Flow Cont Valve, by performing the following:			
	8.1	**RECORD** the charging flow as indicated on 2FI-128A. _____ gpm indicated on 2FI-128A	Records charging flow from 2FI-128A, Charging Pump Flow Indication. (**Typically around 90 gpm**)		
*	8.2	**PLACE** local E/P Bypass Line Selector Valve in Manual.	**Locates local E/P Bypass Selector Valve and simulates rotating valve (clockwise) to MAN position.**		

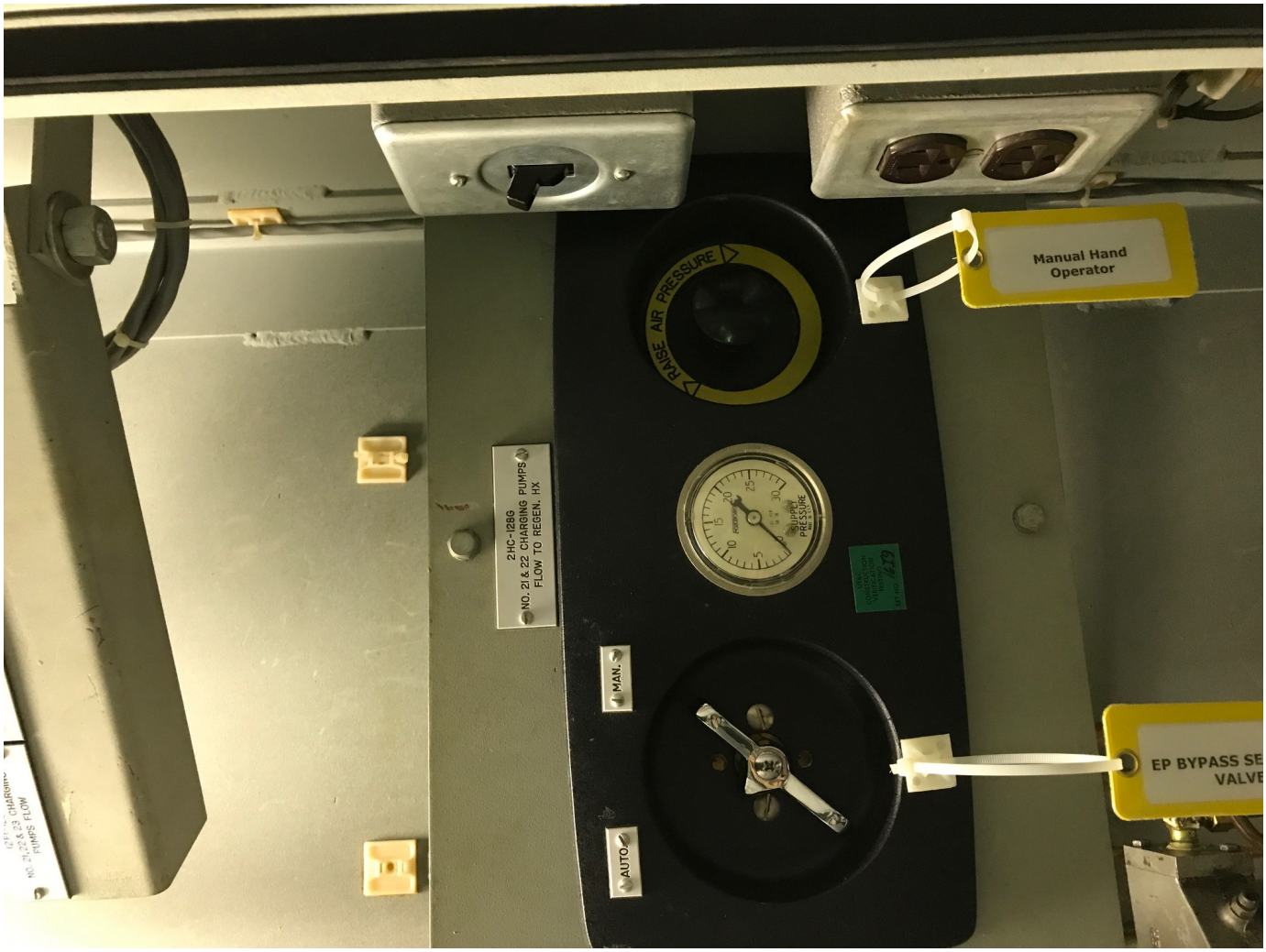
SYSTEM: **Abnormal Plant Evolutions**
TASK: **Locally Control Charging Flow IAW S2.OP-AB.CR-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	8.3	Using the MANUAL hand air operator, **ENSURE** that the flow rate as noted in Step 8.1 is being maintained with 2CV55.	Reads flowrate from 2FI-128A (**Note: field labeled as 2FT-128A**), Charging Pump Flow Indication to ensure the flow rate is maintained with 2CV55. **CUE #1:** *The flow rate is the same as recorded in Step 8.1. The CRS directs you to adjust charging flow to **70 gpm.** (**OR** a value not currently indicating on 2FI-128A).* **Examiner's Note**: the task here is to see if the operator understands how to operate the hand sender to adjust charging flow.		

SYSTEM: **Abnormal Plant Evolutions**
TASK: **Locally Control Charging Flow IAW S2.OP-AB.CR-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*		Adjust charging flow using hand air operator.	**Simulates rotating hand air operator in the clockwise direction to RAISE air pressure to lower charging flow to 70 gpm.** **CUE #1: *Charging flow is 70 gpm.*** **CUE #2:** IF hand sender is rotated counter-clockwise,THEN state the following: ***charging flow has increased to 100 gpm.*** **Examiner's Note:** Raising air pressure lowers flow, Decreasing air pressure raise flow. (2CV55 fails open on loss of air) **CUE #3: JPM is Complete when flow is adjusted to the desired value.**		
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes adjusting charging flow.**		

Inside Charging Panel 216:



JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: **19-01 NRC IP-i**

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __23___ Date ___1-15-20____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor: R. Chan Date: 1-15-20

SME/Instructor: R. Moore Date: 1-16-20

SME/Instructor: J. Klein Date: 1-16-20

INITIAL CONDITIONS:

- ❖ The Unit 2 Control Room has been evacuated in accordance with S2.OP-AB.CR-0001, Control Room Evacuation.
- ❖ A reactor trip from 100% was initiated prior to evacuating the Control Room

INITIATING CUE:

- ❖ You are directed to take local control of charging flow IAW S2.OP-AB.CR-0001, Control Room Evacuation, Attachment 5, starting at Step 8.0 (**see attached page**).
- ❖ Steps 1.0-7.0 of Attachment 5 have been completed.

ATTACHMENT 5
(Page 2 of 4)

REACTOR OPERATOR

NOTE

The following indications and controls are available for local operation at Unit 2 CVC Chg Pmps FL & PR Inst Pnl, Panel 216-2:

- 2CV55 AUTO/MANUAL Selector Switch (2HC-128G No. 21 & 22 Charging Pumps Flow to Regen HX)
- 2CV55 Manual HAND/AIR Regulator Control
- Charging Pump Flow Indication, 2FI-128A
- 21 and 22 Charging Pump Pressure Indication, 2PI-142B
- VCT Level Indication 2LT-114.

___ 8.0 **TAKE** control of 2CV55, Cent Chg Pmp Flow Cont Valve, by performing the following:

___ 8.1 **RECORD** the charging flow as indicated on 2FI-128A.

_____ gpm indicated on 2FI-128A

___ 8.2 **PLACE** local E/P Bypass Line Selector Valve in Manual.

___ 8.3 Using the MANUAL hand air operator, **ENSURE** that the flow rate as noted in Step 8.1 is being maintained with 2CV55.

___ 8.4 **OBSERVE** local air pressure indicator to verify local control.

___ 9.0 **NOTIFY** the CRS and STA that Steps 1 through 8 of Attachment 5 are completed.

Operations Training Program
Job Performance Measure

STATION: SALEM

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

JPM NUMBER: 19-01 NRC IP-j

ALTERNATE PATH: [ ]

K/A NUMBER: G2.1.23

IMPORTANCE FACTOR: 4.3 (RO) 4.4 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: In Plant / Simulate

REFERENCES: SC.OP-SO.CA-0001, Rev. 14 (checked 1-15-20)
DWG 604495, Rev. 2 and 205347 Sht. 2 Rev. 43 (H-6)

TOOLS AND EQUIPMENT: SBO Compressor Building is normally unlocked (L-3 key if locked)

VALIDATED JPM COMPLETION TIME: 20 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-15-20**
Validated By:	**Moore / Weidner** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

Operations Training Program
Job Performance Measure

REVISION HISTORY

JPM NUMBER: 19-01 NRC IP-j

Rev #	Date	Description	Validation Required
00	6-16-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	9-18-19	G2.1.23: Ability to perform specific system and integrated plant procedures during all modes of operation.	Yes

Operations Training Program
Job Performance Measure

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is NOT located inside the RCA.**
- **Need L-3 key to unlock SBO Compressor Building**

Operations Training Program
Job Performance Measure

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

INITIAL CONDITIONS:

- Both Salem Units have tripped due to a loss of off-site power.
- Equipment problems have resulted in NO Emergency Control Air Compressors (ECACs) running.

INITIATING CUE:

- The Unit 2 CRS has directed you to start the Station Blackout Compressor (SBO) IAW SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor, starting with Step 5.1.3 (**see attached**).
- Steps 5.1.1 and 5.1.2 are complete.

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. Operator performs Steps 5.1.3 thru 5.1.16 of SC.OP-SO.CA-0001 correctly and in proper sequence to start the SBO Diesel Control Air Compressor.

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____
TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide marked up copy of the SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor with Prerequisites signed off. Additionally, Step 5.1.1 for removing Inspection Covers will be previously completed, as will Step 5.1.2 to re-install inspection covers.	Operator reviews and signs Precautions and Limitations. Operator must address obtaining hearing protection per P&L 3.1 All other P&Ls require no action other than reading and initialing with the exception of P&L 3.10 is verified at the SBO.		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.1.3	**OPEN** both Engine intake louvers (located outside building on west wall.)	**CUE:** After locating and describing how to open Engine intake louvers, state that ***the Engine intake louvers are open***.		

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____
TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.4	**OPEN** 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, to drain any water accumulation, then CLOSE 1CA1920.	Operator simulates opening 1CA1920 by turning counterclockwise direction. **CUE:** After locating 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, and describing how to open, including that the drain cap must be removed, state: ***1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, has been cycled and no water came out of pipe***. Since the cue would be the same whether or not the drain cap was removed (nothing came out the end of pipe) only comment here for review if pipe cap was not removed.		
	5.1.5	**OPEN** 2FZSBO10, BATTERY CHARGER, breaker.	Locates 2FZSBO10, BATTERY CHARGER, breaker in Panel 2FZSBO, SBO Compressor Bldg Distribution Panel, and simulates opening. **CUE:** ***breaker is open***.		

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____

TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.6	**PLACE** SBO Control Air Dryer switch in ON position.	Locates SBO Control Air Dryer switch and simulates turning switch to ON position. **CUE: *SBO Control Air Dryer switch is ON and Control Air On light is illuminated.***		
	5.1.7	**RECORD** Engine Hourmeter reading on Attachment 1, Section 1.0, and in log book at SBO compressor.	Locates Engine Hourmeter, 1XA16993, Tachometer/Hourmeter, inside engine control panel labeled Compressor Noise Emission Control Information, and records current reading in Section 1.0 of Att. 1. Locates logbook hanging from side of panel 2FZSBO, SBO Compressor Bldg Distribution Panel, and identifies where Engine Hourmeter should be logged.		

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.8	**PLACE** UNLOADER VALVE selector switch in START position.	Locates UNLOADER VALVE selector switch, and ensures switch in START position. **Examiner's Note*:*** UNLOADER VALVE selector switch is <u>normally</u> in START position when engine is shutdown**.**		
		<u>NOTE</u> If engine fails to start after thirty seconds of cranking, allow starter to cool 5 minutes before attempting restart.	Operator reads note and continues on with procedure.		
*	5.1.9	**PRESS** <u>AND</u> **HOLD** BY-PASS VALVE pushbutton.	**Locates BY-PASS VALVE pushbutton in control panel, and simulates depressing <u>AND</u> holding depressed.**		

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____

TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.10	**PLACE** SBO-IGN-SWT, ENGINE IGNITION SWITCH in START position until engine starts, then **RELEASE** to RUN position.	**While keeping the BY-PASS VALVE pushbutton depressed, operator simulates placing the SBO-IGN-SWT, ENGINE IGNITION switch in the START position.** **CUE**: ***Engine has started***. **After CUE is given, operator releases SBO-IGN-SWT switch to RUN.** **Examiner's Note*:*** IF operator releases the BY-PASS VALVE pushbutton at this point without checking oil pressure >15 psig, THEN: **CUE:** ***engine has stopped***. **Examiner's Note**: see step 5.1.11 for actions to re-perform engine start.		

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____

TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.11	When engine oil pressure is >15 psig, **RELEASE** BY-PASS VALVE pushbutton.	**Identifies oil pressure reading on gauge labeled "oil pressure" gauge inside control panel.** **CUE: *Oil pressure is 40 psig*.** **Operator releases BY-PASS VALVE pushbutton**. **Examiner's Note**: IF operator releases this pushbutton **before** verifying oil pressure and was cued that the engine stopped, then the operator will need to re-perform steps 5.1.9 thru 5..1.11. IF operator reads NOTE and waits 5 minutes to cool engine, THEN use: **CUE**: ***5 minutes has elapsed***.		
	5.1.12	**ALLOW** engine to run for 5 minutes to warm up.	**CUE: *5 minutes has elapsed*.**		

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____

TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.13	**OPEN** 1CA1913 SBO COMPRESSOR DISCHARGE VALVE, to pressurize Control Air header.	**Locates and simulates opening in the counter-clockwise direction 1CA1913 SBO COMPRESSOR DISCHARGE VALVE.** **CUE: *valve is open***.		
*	5.1.14	**OPEN** 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.	**Locates and simulates opening in the counter-clockwise direction 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.** **CUE: *valve is open***. **Examiner's Note**: 1CA1886 is located near the entrance to Service Building on right side past the U2 mixing bottle		

Operations Training Program
Job Performance Measure

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____
TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.15	**OPEN** 2CA584, YARD CONTROL AIR SUPPLY VALVE, to pressurize Aux. Building 1A and 2A Control Air headers.	**Locates and simulates opening in the counter-clockwise direction 2CA584, YARD CONTROL AIR SUPPLY VALVE.** **CUE: *valve is open*** **Examiner's Note**: 2CA584 is located near the entrance to Service Building on right side past the U2 mixing bottle.		
*	5.1.16	**PLACE** UNLOADER VALVE selector switch in RUN position.	**Operator returns to the SBO Compressor Building and points out UNLOADER VALVE selector switch and simulates placing it in RUN position.** **CUE: *switch is in RUN*** **JPM is Complete**		

Operations Training Program
Job Performance Measure

SYSTEM: **Generic Administrative – Conduct of Operations** **NAME:** _____
TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes step 5.1.16.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC IP-j

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __14___ Date ____1-15-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-15-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	Z. Weidner	Date:	1-16-20

INITIAL CONDITIONS:

- Both Salem Units have tripped due to a loss of off-site power.
- Equipment problems have resulted in NO Emergency Control Air Compressors (ECACs) running.

INITIATING CUE:

- The Unit 2 CRS has directed you to start the Station Blackout Compressor (SBO) IAW SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor, starting with Step 5.1.3 (**see attached**).
- Steps 5.1.1 and 5.1.2 are complete.

5.0 **PROCEDURE**

5.1 **Compressor Startup**

___ 5.1.1 **REMOVE** the Compressor Inspection Covers (4) AND **ENSURE** the following:

___ A. All belts and hoses are intact AND tightness of the Fan Belt appears proper.

___ B. Radiator level is full (accessible through inspection hatch on top of Compressor Enclosure).

___ C. Compressor oil reservoir level is visible in upper site glass.

___ D. Engine oil level (dip stick), is satisfactory .

___ E. Fuel oil level is ≥3/4 with "SBO-IGN-SWT" in RUN (on Instrument Panel).

___ F. Air After Cooler Fan Motor Oiler level is visible in sightglass.

NOTE

Normally all doors and inspection covers, except instrument panel door, should be closed during compressor operation. However covers may be removed, as required, to ensure the compressor has adequate cooling. **[80084186]**

Compressor Inspection Covers should remain removed during the summer operating period.

___ 5.1.2 IF additional cooling is NOT required,
AND this is NOT the summer operating period,
THEN **RE-INSTALL** Compressor Inspection Covers.

___ 5.1.3 **OPEN** both Engine intake louvers (located outside building on west wall).

___ 5.1.4 **OPEN** 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, to drain any water accumulation, then CLOSE 1CA1920.

___ 5.1.5 **OPEN** 2FZSBO10, BATTERY CHARGER, breaker.

___ 5.1.6 **PLACE** SBO Control Air Dryer switch in ON position.

___ 5.1.7 **RECORD** Engine Hourmeter reading on Attachment 1, Section 1.0 and in log book at SBO Air Compressor.

___ 5.1.8 **PLACE** UNLOADER VALVE selector switch in START position.

NOTE

If engine fails to start after thirty seconds of cranking, allow starter to cool 5 minutes before attempting restart.

___ 5.1.9 **PRESS** AND **HOLD** BY-PASS VALVE pushbutton.

___ 5.1.10 **PLACE** SBO-IGN-SWT, ENGINE IGNITION SWITCH in START position until engine starts, then **RELEASE** to RUN position.

___ 5.1.11 When engine oil pressure is >15 psig, **RELEASE** BY-PASS VALVE pushbutton.

___ 5.1.12 **ALLOW** engine to run for 5 minutes to warm up.

___ 5.1.13 **OPEN** 1CA1913, SBO COMPRESSOR DISCH VALVE, to pressurize Control Air header.

___ 5.1.14 **OPEN** 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.

___ 5.1.15 **OPEN** 2CA584, YARD CONTROL AIR SUPPLY VALVE, to pressurize Aux. Building 1A and 2A Control Air headers.

___ 5.1.16 **PLACE** UNLOADER VALVE selector switch in RUN position.

___ 5.1.17 **RECORD** required readings on Attachment 1, Section 2.0, and at least once every 2 hours thereafter during operation.

ATTACHMENT 1
(Page 1 of 2)

SBO DIESEL CONTROL AIR COMPRESSOR DATA

1.0 **RUN TIME**:

Engine Hour meter (1) (start)	Engine Hour meter (1) (stop)	Run Time

2.0 **OPERATING PARAMETERS**:

Parameter	Criteria	Data							
Discharge Press (1)	>135 psig								
Air Temp (1)	≤255°F								
Water Temp (1)	<215°F								
Oil Press (1)	≥25 psig								
Fuel Oil Level (1)	≥3/4								
Engine Speed (1)	1200-1950 RPM								
Aftercooler Outlet Temp	≤145°F - TL16948								
Pre-filter ΔP	GREEN (1PL16949)								
After-filter ΔP	GREEN (1PL16955)								
Cont Air Hdr Press	>100 psig - (1PL16774)								
Aftercooler Fan (2)	Running	Sat Unsat							
Air Dryer (2)	Cycling	Sat Unsat							
Ambient Temp (Cont Rm SPDS) (2)		°F							

(1) Skid Mounted Instrumentation Panel

(2) Record one time during operation

OPERATOR TRAINING PROGRAM
JOB PERFORMANCE MEASURE

STATION: SALEM

SYSTEM: Liquid Radwaste Release

TASK: Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001.

TASK NUMBER: N0680010101

JPM NUMBER: 19-01 NRC IP-k

ALTERNATE PATH: [ ]

K/A NUMBER: 068 A2.02

IMPORTANCE FACTOR: 2.7* (RO) 2.8* (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: In Plant / Simulate

REFERENCES: S1.OP-SO.WL-0001, Rev. 28 (checked 1-15-20)
S1.OP-TM.ZZ-0002, Rev.8

TOOLS AND EQUIPMENT: Calculator, Tank Capacity Book

VALIDATED JPM COMPLETION TIME: 25 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-15-20**
Validated By:	**Moore / Klein** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

REVISION HISTORY

JPM NUMBER: 19-01 NRC IP-k

Rev #	Date	Description	Validation Required
00	9-18-19	NEW JPM 068 A2.02: Ability to (a) predict the impacts of the following malfunctions or operations on the Liquid Radwaste System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Lack of tank recirculation prior to release	Yes

SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Liquid Radwaste Release

TASK: Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001.

TASK NUMBER: N0680010101

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is located inside the <u>Unit 1</u> RCA.**
-

NAME: _____

DATE: _____

SYSTEM: Liquid Radwaste Release

TASK: Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001.

TASK NUMBER: N0680010101

INITIAL CONDITIONS:

- The 11 CVCS Monitor Tank is at 90% and processing for release is being performed.

INITIATING CUE:

- You are the extra NCO.
- The CRS directs you to place 11 CVCS Monitor Tank in recirculation using section 5.1 of S1.OP-SO.WL-0001, Release of Radioactive Liquid Waste from 11 CVCS Monitor Tank.
- 11 Monitor Tank Pump will be placed in service.

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. **Correctly performs recirculation valve lineup using Attachment 1 IAW S1.OP.SO.WL-0001**
2. **Correctly determines minimum recirculation time of 6 Hrs 30 Mins (band 6 Hrs 20 Mins to 6 Hrs 40 Mins)**

SYSTEM: **Liquid Radwaste Release**

TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide operator the following: **1. Provide filled out copy of S1.OP-SO.WL-0001** **2. S1.OP-TM.ZZ-0002, Tank Capacity Data** **3. Calculator**			
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
		NOTE Any additions made to Monitor Tank that is isolated and placed on recirculation for sampling will invalidate sample analysis, requiring further recirculation time and additional sampling.	Operator reads note and continues on with procedure.		
	5.1	**11 CVCS MT Release Preparation**			

SYSTEM: **Liquid Radwaste Release**

TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.1	**PLACE** valves in "Recirc Position" IAW Attachment 1, Section 1.0	**Operator correctly locates the valves listed on Attachment 1 AND simulates re-positioning each valve to the correct position IAW Attachment 1.** **CUE:** *Report the position of each valve as listed in Attachment 1 (see attached list on page 11).* **Examiner's Note**: The following valves listed in Attachment 1 Section 1.0 are to be in the following positions with 11 MT Tank Pump in service: **11WR27 MT PMP SUCT V – OPEN** **11WR31 MT PMP DISCH V – OPEN** **12WR27 MT PMP SUCT V – CLOSED** **12WR31 MT PMP DISCH V - CLOSED**		
	5.1.2	**DIRECT** second Operator to PERFORM Independent Verification IAW Attachment 1, Section 1.0	**CUE**: *IV's are complete*.		
	5.1.3	**PLACE** LO-LEVEL CUT-OFF switch in TANK 11 position	Operator places LO-LEVEL CUT-OFF switch in the TANK 11 position. **CUE:** *switch is on TANK 11 position*		

SYSTEM: **Liquid Radwaste Release**

TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.4	IF recirculating 11 CVCS MT with 11 MT Pump, THEN **START** 11 MT Pump	**CUE**: *recirculate using 11 MT Pump* **Operator starts 11 MT Pump by depressing start pushbutton.** **CUE:** *Pump is running*		

SYSTEM: **Liquid Radwaste Release**
TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.5	IF recirculating 11 CVCS MT with 12 MT Pump, THEN **START** 12 MT Pump	Operator marks step as N/A		
*	5.1.6	**THROTTLE** 11WR53, MT RECIRC V, to maintain 80 psig on discharge of operating MT Pump	**CUE #1:** *discharge pressure is 40 psig*. **Operator throttles 11WR53 in the closed (clockwise) direction to raise discharge pressure.** **CUE #2:** *discharge pressure is 80 psig*. **CUE #3:** *IF throttled in open direction THEN state: discharge pressure is 20 psig.*		
*	5.1.7	**COMPLETE** Attachment 1, Section 2.0	**Operator correctly completes Attachment 1 Section 2.0 (see steps below)** **Examiner's Note:** Ability to interpret tank curves will be important to determine tank volume and proper minimum recirculation time.		
	ATT 1	Time Recirculated Started (A)	Records current time		
	ATT 1	CVCS Monitor Tank 11 Level	Records 90%		

SYSTEM: **Liquid Radwaste Release**

TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	ATT 1	Volume * *obtained from tank volume S1.OP-TM.ZZ-0002, Tank Capacity Data	**Refers to S1.OP-TM.ZZ-0002 and selects CVCS Monitor Tank curve Page 8.** **Using curve and tank level of 90%operator determines tank volume of 19,500 gallons** **(acceptable band 19,000 to 20,000 gallons)**		
*	ATT 1	Minimum Time required to recirculate tank (B) [(Volume) X 3 / 150 gpm]	**Operator calculates minimum recirculation time of 6 Hrs 30 Min based on 19,500 gallons.** **Acceptable band:** **19,000 gallons = 6 Hrs 20 Mins, to** **20,000 gallons = 6 Hrs 40 Mins**		
		Time Minimum Recirculation Completed (A + B)	Operator adds time (B) to start time (A)		
	5.1.8	**DIRECT** second Operator to **PERFORM** Independent Verification of calculations performed in Attachment 1, Section 2.0	**CUE:** ***IV is complete*** **CUE:** ***JPM is Complete***		

SYSTEM: **Liquid Radwaste Release**

TASK: **Place 11 CVCS Monitor Tank in Recirculation IAW S1.OP-SO.WL-0001**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes Attachment 1 Section 2.0.**		

s1.OP-SO.WL-0001(Q)

ATTACHMENT 1
(Page 1 of 2)

VALVE ALIGNMENT AND DATA

1.0 RECIRC/TRANSFER VALVE ALIGNMENT: (CVCS MT Pmp Rm 64'AB)

NOTE:

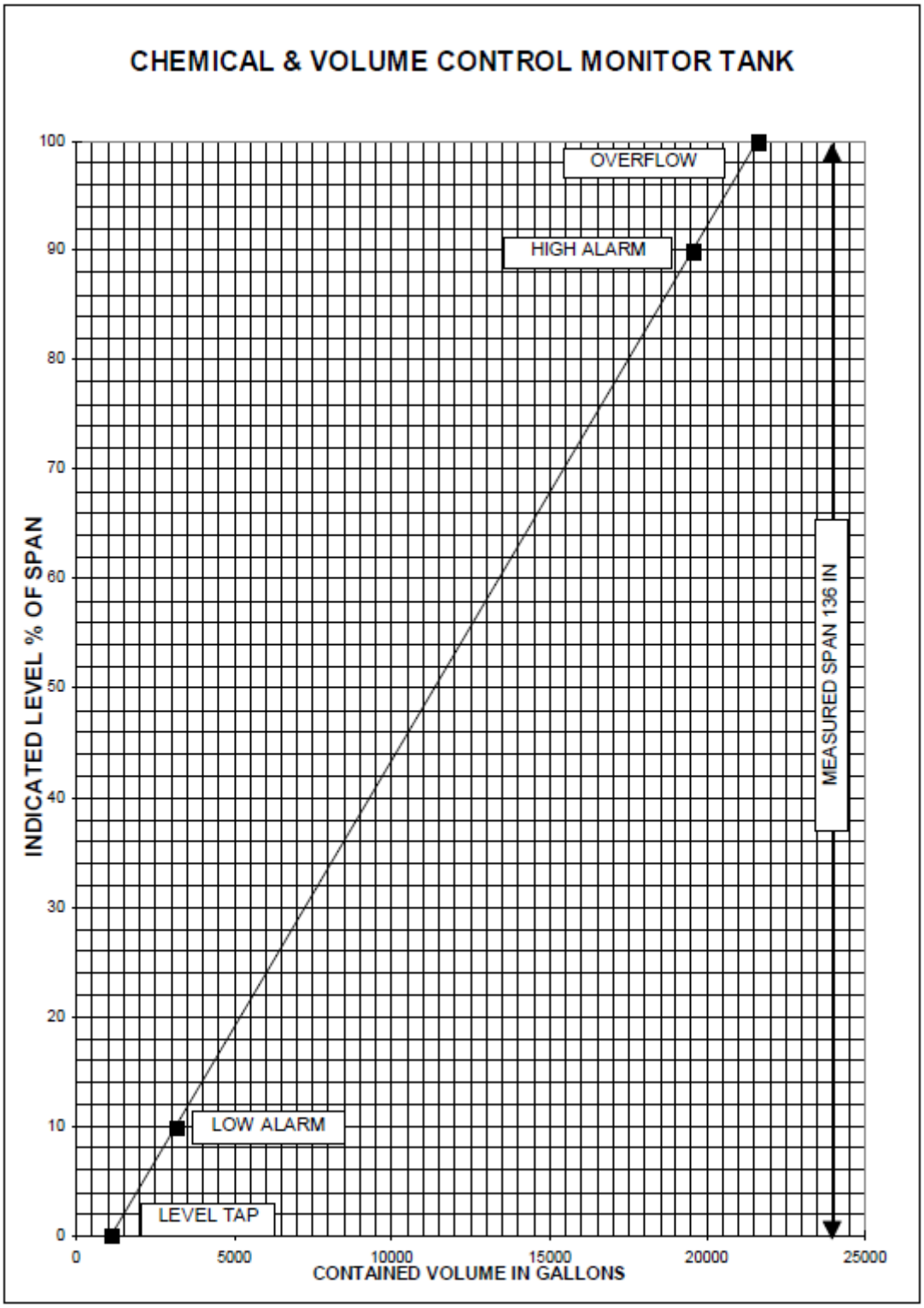
___ When alignment is used for Monitor Tk to Monitor Tk transfer purposes, Section 2.0 of this attachment is not applicable.

Component	Description	Location	Recirc Position	Initials	IV
11WR23	MT INLET V	(CVCS MT Pmp Rm 64´AB)	X		
11WR26	MT OUTLET V		O		
12WR26	MT OUTLET V		X		
11WR27	MT PMP SUCT V		(1)		
11WR31	MT PMP DISCH V		(1)		
12WR27	MT PMP SUCT V		(2)		
12WR31	MT PMP DISCH V		(2)		
1WR55	MT PMP RECIRC EVAP DIST DM V		X		
11WR53	MT RECIRC V		THROT		
12WR53	MT RECIRC V		X		
1WR34	MT PMP PWST STOP V	(Gas Stripper Feed Pmp Rm 64´AB)	LX		
1WR57	MT PMP HUT STOP V		X		
1WR59	MT PMPS OB STOP V		X		

(1) **RECORD** OPEN if 11 Monitor Tank Pump is selected, CLOSED if 12 Monitor Tank Pump is selected.

(2) **RECORD** OPEN if 12 Monitor Tank Pump is selected, CLOSED if 11 Monitor Tank Pump is selected.

S1.OP-TM.ZZ-0002 Tank Capacity Data, Page 8:



ANSWER KEY
(Attachment 1)

S1.OP-SO.WL-0001(Q)

ATTACHMENT 1
(Page 2 of 2)

VALVE ALIGNMENT AND DATA

2.0 **RECIRCULATION DATA**:

Item		Data	
Time Recirculation Started	(A)	Hrs.	Min.
CVCS Monitor Tank 11 Level (1-LIS-180)		90	%
Volume *		19,500	gal
Minimum Time required to recirculate tank [(Volume) x 3 ÷ 150 gpm]	(B)	6 Hrs. 30	Min.
Time Minimum Recirculation Completed	(A)+(B)	Hrs.	Min.
Performed by:	Time:	Date:	
Independent Verification of calculations performed by:			

* Obtain tank volume from S1.OP-TM.ZZ-0002(Q), Tank Capacity Data.

3.0 **DRAINDOWN VALVE ALIGNMENT**:

Component	Description	Location	Draindown Position	Initials
11WR26	MT OUTLET V	CVCS MT PMP Rm 64' AB	X	
11WR53	MT RECIRC V		X	
11WR25	MT DR V		THROT (1)	

(1) **MONITOR** to ensure drain rate is within the capacity of the Auxiliary Sump Tank Pump(s).

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: **19-01 NRC IP-k**

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

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __28___ Date ____1-15-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-15-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	J. Klein	Date:	1-16-20

INITIAL CONDITIONS:

- ❖ The 11 CVCS Monitor Tank is at 90% and processing for release is being performed

INITIATING CUE:

- ❖ You are the extra NCO.
- ❖ The CRS directs you to place 11 CVCS Monitor Tank in recirculation using section 5.1 of S1.OP-SO.WL-0001, Release of Radioactive Liquid Waste from 11 CVCS Monitor Tank.
- ❖ 11 Monitor Tank Pump will be placed in service.

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-1 [AR.ZZ-4, AB.CVC-1, AB.CW-1, AB.LOOP-3, AB.LOAD-1, LOPA-1 w/2C EDG recovery]

SCENARIO NUMBER: 19-01 NRC-1

EFFECTIVE DATE: See Approval Date

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 07

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- See ESG-1806 for previous revision summaries.
- Rev. 06 (3-19-19) (formerly ESG-1806) Modified for 2019 Annual exam. Deleted malfunction for 2R1B and 2LT112 failures. Added PZR level alarm channel fails low, 22 SGFP trip, and one SW pump trips following starting an EDG in LOPA-1.
- Rev. 07 (last used on ESG-1905 2019 LORT Annual Exam). Modified for 19-01 ILOT exam. Used ESG-1905 for EOP-LOPA major actions and modified all other events. Added NRC comments on 6-4-20 to swap malfunction 21 SW Accumulator with RC Wide Range Pressure channel fail low from ESG-3. This is being done to prevent potential overlap with SRO Admin JPM task. Added comments from NRC Prep week 6-17-20.

PREPARED BY:	R. Chan	6-18-20
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	N/A	
	Operations Training Manager	**Date**
APPROVED BY:	N/A	
	Operations Director or designee	**Date**

Last Updated: 8/27/2020 12:33 PM

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 1

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____1_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-201: 90% power, MOL; 23 Charging Pump is in service. The following equipment is out of service: 2C EDG C/T for governor oil replacement and fuel rack lube.

Turnover: The crew is directed to continue power ascension to 100% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using dilution, control rods and turbine load control.

Critical Tasks:

1. Energize at least one AC Emergency Bus (see WOG CT-24)
2. Manually start SW Pump for EDG Cooling (see WOG CT-25)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Power ascension to 100% at 10% per hour IAW IOP-4
2	RC0022A	CRS (TS)	RCS Wide Range Pressure Channel 2PT-405 fails low
3	PR0017A	ATC (I) CRS (I,TS)	PZR Level Channel 1 fails Low
4	EL0048	ATC (C) BOP (C) CRS (C, TS)	Loss of #4 SPT and 23 CW Bus
5	EL0134	ALL (M)	Loss of Offsite Power
6	EL0144 EL0162	ALL (C)	Loss of 2A 4KV Vital Bus 2B EDG Trips on Overspeed (time delayed)
		ABs	AR.ZZ-4 →AB.CVC-1 → AB.CW → AB.LOAD-1 → AB.LOOP-3
		EOPs	TRIP-1 → LOPA-1

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

Scenario No.: 1

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	4	3-6
2. Malfunctions after EOP entry (1-2)	1	6
3. Abnormal events (2-4)	2	3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	LOPA-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	N/A
7. Preidentified critical tasks (≥2)	2	CT-24, CT-25
8. Tech Specs exercised (≥ 2)	3	2,3,4

I. OBJECTIVES

1. Using station procedures perform a reactor power ascension IAW S2.OP-IO.ZZ-0004.
2. Given a malfunction with SW Accumulator, direct/perform actions to respond to the malfunction in accordance with Alarm Response Procedures.
3. Given a malfunction with a PZR level channel, direct/perform actions to respond to the malfunction in accordance with S2.OP-AB.CVC-0001.
4. Given a loss of the #4 SPT direct/perform actions to respond to the loss of #4 SPT in accordance with S2.OP-AB.LOOP-0003.
5. Given a loss of the 23 CW Bus direct/perform actions to respond to the loss of three circulators in accordance with S2.OP-AB.CW-0001.
6. 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 the approved station procedures.
7. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.
8. Given the order or indications of a loss of all AC power, complete actions as the nuclear control operator to PERFORM the immediate response in accordance with the approved station procedures.
9. Given the order with the immediate response to a loss of all AC accident completed and no safety injection actuated or required, perform actions as the nuclear control operator to RECOVER from the loss of AC in accordance with the approved station procedures.
10. Given indication of a loss of all AC power, DIRECT the immediate response in accordance with the approved station procedures.
11. Given the plant with the immediate response completed for a loss of all AC power which did not result in a required safety injection, DIRECT the recovery of the loss of AC in accordance with the approved station procedures.
12. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Power Ascension to 100% at 10%/hour
2. RCS Wide Range Pressure Channel (2PT-405) fails low (TS only)
3. PZR Level Channel 1 fails low (TS)
4. Loss of #4 SPT and Loss of 23 CW Bus (power reduction) (TS)
5. Loss of Offsite Power
6. Loss of 2A Vital Bus and 2B EDG Trips on Overspeed.

III. SCENARIO SUMMARY

1. The crew takes the watch with the unit at 90% power, MOL. 2C EDG is C/T for governor oil replacement and fuel rack lube with 68 hours remaining in the TSAS.
2. The crew will be briefed prior to taking the watch to perform power ascension to 100% at 10%/hour. The crew will directed to initiate a dilution, adjusting control rods and turbine load control for raising reactor power.
3. After the power ascension has commenced, the RCS Wide range Pressure Channel 2PT-405 will fail low. The crew will recognize the failed channel by OHA alarm and 2RP4 indication on Subcooling Margin Monitor. The crew will take action IAW **S2.OP-AR.ZZ-0004** and determine an invalid indication. The CRS will enter TS 3.3.3.7 Action a.1
4. Following actions for RCS Wide Range pressure channel failure, Pressurizer Level Channel 1 will fail low and result in the loss of letdown flow. The crew will take action IAW S2.OP-AB.CVC-0001, Loss of Charging, to take manual control of charging flow, swap to operable channel, and restore pressurizer heaters and letdown flow. The CRS will enter TS 3.3.1.1
5. Once the crew has addressed the failed pressurizer level channel, a loss of #4 Station Power Transformer (SPT) and 23 CW Bus will occur. The crew will take the following actions; enter S2.OP-AB.CW-0001 for a loss 21A-23A circulators and S2.OP-AB.LOOP-0003, Partial Loss of Offsite Power. As a result of the loss of 23 CW Bus, condenser differential temperatures (DT) will exceed the limits of 27 F and require a turbine load reduction (to less than 80% power) to reduce DTs. The crew may re-energize 23 CW Bus IAW AB.LOOP-0003 Attachment 4 by closing the cross-tie breaker from 24 CW Bus. The CRS will enter TS 3.8.1.1 Action c (one off-site source and one EDG inoperable).
6. After the crew has initiated a turbine load reduction, a loss of offsite power will occur. The reactor will automatically trip and the crew will enter 2-EOP-TRIP-1, Reactor Trop or Safety Injection. While in EOP-TRIP-1, a loss of 2A 4kV Vital Bus on Bus Differential protection and the 2B EDG will trip on overspeed resulting in a loss of all 4KV Vital Busses. The crew will transition to 2-EOP-LOPA-1, Loss of All AC Power, based on all three vital busses de-energized.
7. While in EOP-LOPA-1, the crew will recognize that the 2A EDG is running with no service water pumps and will need to be stopped. Maintenance will return 2C EDG to available status following SI Reset in EOP-LOPA-1. Following the report of the release of 2C EDG from the

work control supervisor, the crew will start 2C EDG, close its output breaker and re-energize the 2C 4KV Vital Bus [**Critical Task #1**]. Once the bus is re-energized, the crew will start one service water pump to provide EDG cooling [**Critical Task #2**].

8. The scenario will terminate when 2C 4KV vital bus is re-energized and the crew starts one SW Pump to provide EDG cooling.

IV. INITIAL CONDITIONS

____ **IC-201**

PREP 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	**2C EDG C/T**
____ 9	**Jet C/T**
___ 10	**Suggested Protected Equipment:** ▪ **2A and 2C EDGs**
___ 11	**S2.OP-IO.ZZ-0004 open at Step 4.1.25**
___ 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

EVENT TRIGGERS:

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

MALFUNCTIONS:

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-2	0
_____ 02	EL0048 LOSS OF #4 STAT POWER XFMR-DIFF	N/A	N/A	N/A	RT-3	
_____ 03	EL0134 LOSS OF ALL 500KV OFF-SITE POWE	N/A	N/A	N/A	RT-4	
_____ 04	EL0144 LOSS OF 2A 4160V VITAL BUS	00:00:30	N/A	N/A	ET-1	
_____ 05	EL0162 2B EMERG DIESEL GENERATOR TRIP	00:00:30	N/A	N/A	ET-1	
_____ 06	VL0083 2SJ1 Fails to Position (0-100%)	N/A	0	00:01:00	RT-14	100
_____ 07	VL0085 2CV40 Fails to Position (0-100%)	N/A	0	00:01:00	RT-15	0
_____ 08	VL0053 2SW26 Fails to Position (0-100%)	N/A	0	00:02:00	RT-15	0
_____ 09	VL0045 2CV116 Fails to Position (0-100%)	N/A	0	00:02:00	RT-13	0
_____ 10	VL0087 2CC131 Fails to Position (0-100%)	N/A	0	00:01:00	RT-7	0
_____ 11	VL0580 21MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 12	VL0581 22MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 13	VL0582 23MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 14	RC0022A RCS PRESS (PT405) FAILS HI/L	N/A	N/A	N/A	RT-1	0

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-12	YES
_____ 02	DG02D DEENERGIZE "B" SEC CABINET	00:00:05	N/A	N/A	RT-12	YES
_____ 03	DG03D DEENERGIZE "C" SEC CABINET	00:00:10	N/A	N/A	RT-12	YES
_____ 04	DG28D 2C DIESEL GEN LOCKED OUT	N/A	N/A	N/A	N/A	YES
_____ 05	DG29D 2C DG BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 06	DG30D 2C DG BKR RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 07	CV28A 21CV98 RCP SEAL INJ MAN ISOL	00:02:00	7500	00:01:00	RT-9	0

_____ 08	CV29A 22CV98 RCP SEAL INJ MAN ISOL	00:03:00	7500	00:01:00	RT-9	0
_____ 09	CV30A 23CV98 RCP SEAL INJ MAN ISOL	00:04:00	7500	00:01:00	RT-9	0
_____ 10	CV31A 24CV98 RCP SEAL INJ MAN ISOL	00:05:00	7500	00:01:00	RT-9	0
_____ 11	AF20D 21 AFW PUMP BKR CONTROL POWER	00:01:00	N/A	N/A	RT-6	OFF
_____ 12	AF25D 22 AFW PUMP BKR CONTROL POWER	00:01:30	N/A	N/A	RT-6	OFF

OVERRIDES:

SELF-CHECK	**Description**	**Delay Time**	**Initial Value**	**Ramp Time**	**Trigger**	**Condition/ Severity**

OTHER CONDITIONS:

	Description

_____ 1.

V. SEQUENCE OF EVENTS

1. State shift job assignments.
2. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
3. Inform the crew “The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift”.
4. Allow sufficient time for panel walk-downs. When informed by the SM 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. Power Ascension to 100%			
	CRS holds crew brief to discuss Rx Plan for power ascension to 100% IAW S2.OP-IO.ZZ-0004.		
	RO commences a dilution IAW S2.OP-SO.CVC-0006.		
	PO raises main generator loading IAW S2.OP-SO.TRB-0001.		
Proceed onto next event after power ascension has commenced or by direction from Lead Examiner			
2. RCS Wide Range Pressure Channel fails low (2PT-405):			
Simulator Operator: Insert RT-1 on direction from Lead Examiner. **RC0022A, 2PT-405 fails H/L** **Value = 0**			
	RO reports unexpected OHA alarms for D-40 SUBCLG CH A MARGIN LO.		
	RO reports Subcooling Channel A is lost to monitor on 2RP4 and recorder on 2CC2.		
	Crew refers to OHA D-40 ARP.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 2PT-405 has failed low.		
	ARP refers CRS to review Tech Specs.		
TS evaluation #1:			
	CRS enters TS 3.3.3.7 Action a.1 (30 days)		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
3. PZR Level Channel 1 Fails Low			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. This will insert the following malfunction: **PR0017A PZR level CH 1 Fails Low Value = 0**			
	RO reports unexpected OHA E-36, PZR HTR OFF LVL LO and diagnoses failure of PZR level channel.		
	RO reports letdown isolated		
Examiner's Note: Crew may place Master Flow Controller in Manual prior to entering AB procedure.			
	CRS enters S2.OP-AB.CVC-0001, Loss of Charging.		
	PO initiates of Attachment 1 CAS.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 23 charging pump is running.		
	RO reports there is no indication of cavitation.		
	RO reports PZR level channel 1 has failed Low.		
	RO takes manual control of charging flow, if not previously done, and lowers charging flow to minimize level rise in PZR.		
	RO selects operable channel for Control, Alarm and Recorder.		
	RO energizes PZR heaters to normal alignment		
Examiner's Note: An auto CVCS makeup to the VCT may occur at some point based on no letdown flow.			
Restoration of Letdown:			
	RO ensures open 2CV7		
	RO places 2CV18 in Manual and opens until close PB extinguishes		
	RO opens 2CV2 and 2CV277 and place in Auto		
	RO ensures charging flow ≈ 85-90 gpm		
	RO opens one letdown orifice (2CV3, 4, 5) and adjusts 2CV18 to maintain letdown pressure ≈ 300 psig		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO places 2CV18 in Auto		
	CRS directs charging placed in Auto when PZR level returns to program		
	CRS directs Maintenance assistance to remove failed channel from service IAW S2.OP-SO.RPS-0003.		
TS evaluation #2:			
	CRS enters TS 3.3.1.1 Action 6 (6 hours). Note: T/S 3.3.3.5 and 3.3.3.7 do not apply.		
Proceed to next event after Tech Specs evaluated or at direction of Lead Examiner			
4. Loss of #4 SPT			
Simulator Operator: Insert **RT-3** on direction from Lead Examiner. This will insert the following malfunction: **EL0048, Loss of #4 SPT**			
	PO reports several OHA alarms for B and K window and investigates the cause.		
	PO reports one or more of the following: • 500 KV Bus Section 1 is de-energized, • Loss of #4 SPT • All the Vital Busses are energized from 24 SPT (single source of off-site power).		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that 23 CW Bus is de-energized and 21A thru 23A CW pumps have tripped.		
Examiner's Note: The crew will need to enter 2 AB procedures. Following the trip of the 21A-23A circulators, the crew should recognize that the condenser DTs have exceeded the procedural limit of 27 F and initiate a turbine load reduction to less than 80% IAW S2.OP-AB.CW-0001 as the first priority.			
S2.OP-AB.CW-0001 starts here:			
	Crew enters S2.OP-AB.CW-0001, CW System Malfunction.		
	PO initiates Attachment 1 CAS.		
	PO reports no pipe ruptures in the circulating system.		
	PO reports 3 circulators are out of service.		
	PO reports condenser hotwells are being maintained.		
	PO reports at least once circulator pump in operation on each condenser.		
	CRS dispatches field operators to OPEN the 21-23MC62, TURB HOD SPRAY NYPASS VLV on affected condenser.		
Simulator Operator: Insert **RT-8** to simulate opening of 21-23MC62 Hood Spray Bypass valve.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
VL0580, 21MC31 fails to position **VL0581, 22MC31 fails to position** **VL0582, 23MC31 fails to position** **Value = 5%** (Monitor hood spray temps on P250 to maintain 100 F)			
	CRS directs PO to monitor condenser hotwell and condensate pump suction piping for signs of flashing.		
	CRS directs event response team to investigate cause of loss of 23 CW Bus.		
	PO reports that condensate pump suction temperature temp is less than 120 F.		
	CRS contacts Chemistry to maintain chlorination parameters within limits and monitor condensate polisher resin.		
Condenser DTs exceed 27 F (load reduction):			
	PO reports that Attachment 1 CAS Step 5 Condenser DTs is greater than 27 F and that a load reduction is required.		
	Crew briefs reactivity plan for turbine load reduction IAW **S2.OP-AB.LOAD-0001**, Rapid Load Reduction.		
Examiner's Note: During validation, the crew needed to lower turbine load to less than 80% power to lower DTs to less than 27 F. The crew may perform load reductions is small power increments until the desired DT is reached.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO initiates boration IAW S2.OP-SO.CVC-0006		
	PO initiates turbine load reduction as directed by CRS IAW AB.LOAD-0001 and S2.OP-SO.TRB-0001.		
	RO reports when control rods are inserting to maintain Tavg on program.		
	RO energizes all PZR heaters.		
IF the crew determines to NOT re-energize 23 CW Bus, THEN by direction from Lead Examiner, use the below Role Play to direct the crew to re-energize the 23 CW Bus.			
Re-energizing 23 CW Bus IAW S2.OP-AB.LOOP-3:			
Possible Role Play: ***This is Rick DeSanctis Operations Director, for plant stability you are directed to re-energize the 23 CW Bus IAW S2.OP-AB.LOOP-0003.***			
S2.OP-AB.LOOP-0003, Partial Loss of Off-site Power, starts here:			
	PO initiates Attachment 1 CAS		
	CRS notifies SM to refer to ECGs		
	PO reports no 4KV Vital Bus powered by EDGs		
	PO reports 500 KV Bus Section 1 is de-energized and		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Bus Section 2 is energized.		
	CRS request **Unit 1** to OPEN the following breakers: • 500 KV BS 1-5 breaker (12X) • 500 KV BS 1-8 breaker (20X) [**Note**: already open as part of the event, indication is on 2CC3]		
Role Play: Respond as Unit 1 Operator that both the 500 KV BS 1-5 and 1-8 breakers are OPEN.			
	PO OPENS 500 KV BS1-9 breaker (32X) [Note: already open as part of the event]		
	CRS initiates action to determine the cause of loss of 500 KV BS 1		
	PO OPENS 500 KV Circuit Switchers: • **2T60, 13 KV Ring Bus** • **4T60, 13 KB South Bus**		
Re-energizing 23 CW Bus:			
	CRS directs PO to energize 2CW Bus Section 23 from Bus Section 24 IAW Attachment 4.		
Examiner's Note: The crew at this time may determine not to re-energize 23 CW Bus until the cause of the event is determined.			
	PO reports that OHA's K-2 and K-10 are clear.		
	PO reports that the breakers listed in Attachment 4 Step 1.2 are OPEN.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports 2CW Bus Section 24 voltage is within the band of 4.22-4.36KV		
	PO PRESSES 2CW2BD AUTO SWAP OFF pushbutton and ensures pushbutton is illuminated.		
	PO PRESSES Mimic Bus 2CW SWGR BUS-TIE BREAKER 2CW2BD pushbutton and ensures bezel is illuminated.		
	PO PRESSES 2CW2BD CLOSE pushbutton and ensures the breaker goes CLOSED, Bus Section 23 voltage is within the band of 4.22-4.36KV, and 2CW2BD Mimic bezel is extinguished.		
TS evaluation #3:			
	CRS enters TS 3.8.1.1 Action C (1 hour and 12 hours) for one source of off-site power <u>and</u> one EDG Inoperable.		
<u>Examiner's Note</u>: Tech Spec evaluation could be delayed until end of scenario by Lead Examiners discretion.			
Proceed to next event by direction from Lead Examiner.			
5. Loss of Offsite Power			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert **RT-4** on direction from Lead Examiner. This will insert malfunction: **EL0134, Loss of Offsite Power**			
	RO reports reactor automatically tripped and performs immediate actions of 2-EOP-TRIP-1. • Trips the reactor • Confirms the reactor tripped • Trips the main turbine		
5. Loss of 2C Vital Bus and 2B EDG Emergency Trips on Overspeed:			
Simulator Operator: Ensure **ET-1** is TRUE following Rx Trip. This will insert the following malfunctions: **EL0144, Loss of 2A Vital Bus (Bus Diff Protection)** **EL0162, 2B EDG Emerg Trips on Overspeed** **Time Delay = 30 seconds**			
	RO reports that all 4KV Vital Busses are de-energized.		
EOP-LOPA-1 starts here:			
	Crew transitions to 2-EOP-LOPA-1, Loss of All AC Power.		
	PO throttles AFW flow to no less than 22E4 lbm/hr.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO performs immediate actions of LOPA-1: ▪ Trip the Reactor ▪ Trip the Turbine		
	CRS and RO verify performance of immediate actions.		
	RO closes 2CV2 and 2CV277		
	RO reports 2CV278 and 2CV131 are closed.		
	RO reports that both PZR PORVs are closed.		
	PO reports total AFW pump is > 22E4 lbm/hr.		
	RO makes page announcement.		
	CRS dispatches operator to de-energize all SECs.		
De-energize SECs:			
Simulator Operator: After being contacted, Insert **RT-12** to de-energize all SECs with a time delay. **REMOTES:** **DG01D** De-energize A SEC **DG02D** De-energize B SEC **DG03D** De-energize C SEC **NOTIFY** CRS when complete.			
Examiner's Note: Around this point the crew should be discussing strategy to recover a vital			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
bus. 2B EDG tripped on overspeed and will take some time to troubleshoot. 2C EDG is C/T for minor maintenance. 2A vital bus is de-energized on Bus Differential protection and therefore not expected back soon. Crew should determine that success path is to restore 2C EDG from maintenance and start the diesel.			
	CRS directs performance of blackout coping actions of S2.OP-AB.LOOP-1, Att 2, Part A.		
Role Play (AB.LOOP-1, Attachment 2 Part A): After **10-15 minutes** report back that Blackout Coping actions in Attachment 2 Section 1.A and 1.B have been completed within 30 minutes.			
	PO reports 23 AFW supplying feed flow to SGs.		
	Crew waits until all SECs are de-energized.		
	CRS receives report that all SECs are de-energized.		
Stop running EDGs:			
	PO stops 2A EDG based on no service water pump running IAW CAS of LOPA-1.		
	RO depresses stop pushbutton for all loads in Table A of LOPA-1.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: PO may report the following to the crew regarding vital bus status: **2A Bus** – Bus de-energized, EDG is running with No Service Water pumps in service, OHA for Bus Differential Bus de-energized **2B Bus** – Bus de-energized, EDG started but emergency tripped **2C Bus** – EDG is C/T			
	PO reports status of 4 KV Vital Busses and priority should be placed on restoring 2C EDG from maintenance.		
Role Play (2B EDG): IF dispatched, report that ***B EDG tripped on overspeed and the fuel rack linkage looks bent***. **Role Play (Maintenance on 2C EDG)**: When contacted about status of 2C EDG maintenance, ***state that you will go to the field to get a status from maintenance***.			
	PO reports that no 4 KV Vital Bus are energized		
	RO reports that SI has not actuated or required.		
Examiner's Note: There will be no console indications to verify valve positions during LOPA-1 only local field reports.			
	CRS directs WCC to Open 2SJ1 or 2SJ2		
Simulator Operator: Insert **RT-14** to open 2SJ1.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
VL0083 2SJ1 fails to position **Final = 100** **Ramp: 01:00 mins**			
	CRS directs WCC to Close 2CV40 or 2CV41.		
Simulator Operator: Insert **RT-15** to close 2CV40. **VL0085 2CV40 fails to position** **Final = 0** **Ramp: 01:00 mins**			
	CRS directs WCC to Close 2SW26.		
Simulator Operator: Insert **RT-15** to close 2SW26. **VL0053 2SW26 fails to position** **Final = 0** **Ramp: 02:00 mins**			
	RO reports SI has not actuated and initiates SI.		
	Crew verifies closure of Phase A and CVI valves. Note: 2CV116 closed later.		
Proceed to Role Play below when SI is being reset:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: ***Notify CRS that Maintenance has returned 2C diesel and the tag release should be completed in next 5 minutes. Will notify you when release is confirmed and IV completed.***			
Simulator Operator: **MODIFY** the following Remotes to simulate releasing tags on 2C EDG: **DG29D, Output Bkr control power to ON** **DG30D, Output Bkr Racked Out to UNTAGGED** **DG28D, 2C Lockout Switch to NO (expect OHA alarm when reset)**			
	RO resets SI.		
	RO resets Phase A signal.		
	RO opens 21 and 22 CA330s.		
	CRS directs WCC to remove control power for 21 and 22 AFW pumps.		
Simulator Operator: Insert **RT-6** to remove control power to 21 and 22 AFW pumps. **Remote:** **AF20D, 21 AFW Control Power** **AF25D, 22 AFW Control Power** **Value = OFF**			
	CRS request assistance to restore power IAW S2.OP-AB.LOOP-0001, Loss of Offsite Power, while		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	continuing with LOPA-1.		
EOP-LOPA-1, Step 26 starts here:			
	CRS reads Step 26, "When at least one 4kV vital bus is energized, THEN go to step 43".		
Role Play: Notify CRS that 2C EDG tags are released and IVs complete.			
	CRS informs crew to not start any Charging pumps until directed.		
Examiner's Note: When the 2C EDG tags are released, the crew should return to step 14 to start the EDG and energize the bus.			
Starting 2C EDG:			
Critical Task #1 (CT-24): Energize one vital bus before transition out of LOPA-1. **SAT_____ UNSAT_____**			
	CRS returns to CAS Step 14 after notification that 2A EDG tags are released.		
	PO depresses start PB for 2C EDG and observes voltage increasing to 4KV.		
	PO depresses 2C EDG output breaker mimic PB and ensures mimic PB backlight illuminates.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO depresses 2C EDG output breaker closed PB bezel and verifies closed PB illuminates. [Critical Task #1 complete]		
Critical Task #2 (CT-25): Start one SW pump on running EDG before transition out of LOPA-1. **SAT_____ UNSAT_____**			
	PO starts 25 or 26 SW pump. [Critical Task #2 complete]		
	CRS directs WCC to close 2CV83, 2CV89 and 2CV95 and 2CV116		
Simulator Operator: Insert RT-9 to close 21-24 CV98. This will simulate closure for 2CV83, 2CV89 and 2CV95 to isolate seal injection filters. **Remotes:** **CV28A, 21CV98 fails to position** **CV29A, 22CV98 fails to position** **CV30A, 23CV98 fails to position** **CV31A, 24CV98 fails to position** **Final = 0** **Ramp: 1 min** **Delay = 0-5 mins**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert RT-13 to close the 2CV116 valve. **VL0045 2CV116 fails to position** **Final = 0** **Ramp = 2 min**			
	CRS directs WCC to close 2CC131.		
Simulator Operator: Insert RT-7 to close 2CC131. **VL0087 2CC131 fails to position** **Final = 0** **Ramp: 01:00 min**			
Terminate scenario when crew starts one SW Pump on 2A Bus or as direct by Lead Examiner.			

VI. SCENARIO REFERENCES

1. Alarm Response Procedures (Various)
2. Technical Specifications
3. Emergency Plan (ECG)
4. OP-AA-101-111-1003, Use of Procedures
5. S2.OP-IO.ZZ-0004, Power Operation
6. S2.OP-AB.CVC-0001, Loss of Charging
7. S2.OP-AB.LOOP-0001, Loss of Off-site Power
8. S2.OP-AB.LOOP-0003, Partial Loss of Offsite Power
9. S2.OP-AB.CW-0001, Circulating Water System Malfunction
10. S2.OP-AB.LOAD-0001, Rapid Load Reduction
11. 2-EOP-TRIP-1, Rx Trip or Safety Injection
12. 2-EOP-LOPA-1, Loss of All AC Power

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 90% RCS BORON: 837 MWe 1090

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

NA

REACTIVITY PARAMETERS

- Rx Plan: To raise Rx power 10% at 10%/hour add 1500 gallons of water along with withdrawing control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a dilution first.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.8.1.1.b Action b (72 hrs), 2C EDG, 68 hours remain.

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- S2.OP-ST.500-0001 was just completed 1 hour ago.
- S2.OP-IO.ZZ-0004 in progress at Step 4.1.25.

ABNORMAL PLANT CONFIGURATIONS:

- Jet is C/T due to emergent troubleshooting of output breaker failing to close.

CONTROL ROOM:

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

PRIMARY:

- 2C EDG C/T for governor oil replacement and fuel rack lube.

SECONDARY:

- Polisher in service
- Blowdown 35K per loop to 23 Condenser / Flashtank

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

None

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 ECG 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.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario 1 **REVIEWER: R. Chan**

Initials		Qualitative Attributes
R	1.	The scenario has clearly stated objectives in the scenario.
R	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.
R	3.	The scenario consists mostly of related events.
R	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
R	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.
R	6.	The events are valid with regard to physics and thermodynamics.
R	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
R	8.	The simulator modeling is not altered.
R	9.	All crew competencies can be evaluated.
R	10.	The scenario has been validated.
R	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.
R	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

19-01 NRC Scenario 1

CT-1 (CT-24):

Critical Task: Energize at least one AC emergency bus before transition out of EOP-LOPA-1.

BASIS: See WOG Rev. 2

CT-2 (CT-25):

Critical Task: Manually start one SW pump for EDG cooling before transition out of EOP-LOPA-1.

BASIS: See WOG Rev. 2

ATTACHMENT 6

ESG-PRA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

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

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	**Y**	Any Diesel Generator
N	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
Y	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

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-2 [ARP, AB.COND-1, AB.ROD-3, AB.RC-1, TRIP-1, LOCA-1, LOCA-5]

SCENARIO NUMBER: 19-01 NRC ESG-2

EFFECTIVE DATE: See Approval Dates

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 04

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- See ESG-1807 for previous revisions.
- Rev. 03 (last used 2019 Annual ESG-1913) Modified for 19-01 ILOT NRC exam. Modified abnormal events. Incorporated comments from validation; added 22 vacuum pump trip.
- Rev 04 Incorporated comments from NRC working mtg on 2-14-20 to reduce the scenario duration. Deleted Loss of Off-site Power and Loss of 2A 4KV Vital Bus. Added 21 RHR Pump is C/T for maintenance to support LOCA-5 conditions. Added comments from NRC Prep Week 6-17-20.

PREPARED BY:	R. Chan **Lead Regulatory Exam Author**	6-18-20 **Date**
APPROVED BY:	N/A **Operations Training Manager or designee**	 **Date**
APPROVED BY:	N/A **Operations Director or designee**	 **Date**

Last Updated: 8/27/2020 12:37 PM

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 2

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____2_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-211: 100% power, EOL; 21 Charging Pump I/S. The following equipment is out of service: 23 Charging Pump and 21 RHR Pump are C/T for maintenance.

Turnover: The crew is directed to reduce power to 89% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using boration, control rods and turbine load control in preparation for Main Turbine valve testing.

Critical Tasks:

1. Manually actuate SI (see WOG CT-2)
2. Manually start one low head ECCS pump (see WOG CT-5)
3. Make-up to RWST and minimize RWST outflow (see WOG CT-29)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Load reduction to 89% at 10% per hour IAW IOP-4
2	SG0100C	CRS (TS)	23 SG Pressure Channel 3 fails low
3	VC0087C	BOP (C) CRS (C)	24 vacuum pump trips
4	RC0015D	ATC (I) CRS (I, TS)	24 Loop Cold Leg RTD fails high
5	RC0002 RP0108	ALL (M)	-RCS Leak (18000 gpm, ramped) -Auto Safety Injection fails to actuate
6	RC0001A	ALL (C)	Large Break LOCA
7	RP318A2	BOP (I) CRS (I)	22 RHR Pump fails to start on SEC signal
8	RH0026B	ATC (C) CRS (C)	22 RHR Pump trips
		ABs	IOP-4 → AR.ZZ-2 → AB.COND-1 → AB.ROD-3 → AB.RC-1
		EOPs	TRIP-1 → LOCA-1 → LOCA-5

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

Scenario No.: 2

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	2-8
2. Malfunctions after EOP entry (1-2)	3	6,7,8
3. Abnormal events (2-4)	3	2,3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	LOCA-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	LOCA-5
7. Preidentified critical tasks (≥2)	3	CT-2, CT-5, CT-29
8. Tech Specs exercised (≥ 2)	2	2,4

I. OBJECTIVES

A. Given the order, perform a turbine load reduction in accordance with station procedures.

B. Given indications of a Steam Generator instrumentation malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.

C. Given indication of a Steam Generator instrumentation malfunction, DIRECT the response to the malfunction in accordance with the approved station procedures.

D. Given indications of a loss of vacuum, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW approved station procedures.

E. Given indications of a loss of vacuum, DIRECT the response to the malfunction IAW approved station procedures.

F. Given indications of a RCS RTD instrument failure, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures.

G. Given indications of a RCS RTD instrument failure, DIRECT the response to the malfunction in accordance with approved station procedures.

H. Given an RCS leak at power, respond to the event IAW approved station procedures.

I. Given the indications of a reactor coolant system (RCS) malfunction or leak, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.

J. Given the indications of a reactor coolant system (RCS) malfunction or leak, DIRECT the response to the malfunction in accordance with the approved station procedures.

K. 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 the approved station procedures.

L. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

M. Given the order or indications of a reactor trip, perform actions as the shift technical advisor to RESPOND to the reactor trip in accordance with the approved station procedures.

N. 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.

O. Given indication of a safety injection DIRECT the response to the safety injection in accordance with the approved station procedures.

P. Given the order or indications of a safety injection, perform actions as the shift technical advisor to RESPOND to the safety injection in accordance with the approved station procedures.

Q. Given a safety injection has occurred and equipment has failed to start, START equipment that has failed to automatically start in accordance with station procedures.

R. 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.

S. Given indication of a loss of coolant accident (LOCA), DIRECT the immediate response to the LOCA in accordance with the approved station procedures.

T. Given the order or a loss of coolant accident (LOCA) with indication of a loss of emergency recirculation, perform actions as the nuclear control operator to RESPOND to the loss of emergency recirculation in accordance with the approved station procedures.

U. Given a loss of coolant accident (LOCA) and a loss of emergency recirculation, DIRECT actions to respond to the emergency recirculation loss in accordance with the approved station procedures.

V. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Planned Load Reduction to 89% at 10%/hour
2. 23 SG Pressure Channel 3 Fails Low (TS only)
3. 24 Vacuum Pump trips
4. RC Loop 24 Cold Leg RTD Fails High (TS)
5. RCS Leak
6. 22 RHR Pump Fails to Start on SEC Signal
7. Loss of Emergency Recirculation capability (22 RHR Pump Trips)

III. SCENARIO SUMMARY

1. The crew assumes the watch at 100% power, EOL. 23 Charging Pump is C/T for pulsation damper repairs with 21 Charging Pump in service, 21 RHR is C/T for motor bearing replacement.
2. After assuming the watch, the crew will brief a planned load reduction to 89% at 10%/hour IAW **S2.OP-IO.ZZ-0004**, Power Operation, in preparation for Main Turbine Valve testing next shift.
3. After the power reduction has commenced, 23 SG Pressure Channel 3 will fail low. The crew will respond IAW Alarm Response Procedure and determine that the event has no impact to plant operations. The CRS will enter TS 3.3.2.1.b Action 19.
4. After the 23 SG Pressure Channel has been addressed, 24 condenser vacuum pump will trip. The crew will recognize that condenser backpressure is slowly rising and enter **S2.OP-AB.COND-0001**, Loss of Condenser Vacuum. The crew will start all available vacuum pumps and stabilize condenser back pressure.
5. After the crew addresses vacuum pump trip, 24 Loop Cold Leg RTD will fail high causing control rods to continuously insert. The crew will verify no turbine runback in progress and place rods in manual. The crew will enter **S2.OP-AB.ROD-0003**, Continuous Rod Motion, and place rods to manual, defeat the failed channel, place Charging Flow in manual, then restore rods to Auto. The CRS will enter TS 3.3.1.1, Action 6 and 3.3.2.1.b Action 19.
6. Once actions for 24 Loop RTD failure is addressed, a RCS leak will occur resulting in rapidly lowering PZR level and pressure. The crew will take CAS actions in **S2.OP-AB.RC-0001** and manually trip the reactor. Immediately following the Rx Trip the RCS leak will escalate into a Large Break LOCA and a malfunction will prevent Auto Safety Injection to actuate. The crew will respond by manually initiating SI [**Critical Task #1**]. The crew will enter **EOP-TRIP-1,** Reactor Trip or Safety Injection.
7. While in EOP-TRIP-1, the crew will recognize that 22 RHR Pump failed to start on SEC signal. The crew will block and reset 2B SEC, then manually start 22 RHR Pump [**Critical Task #2**].
8. The crew will perform diagnostics in EOP-TRIP-1 and eventually transition to **EOP-LOCA-1**, Loss of Coolant, based on containment pressure > 4 psig. While in EOP-LOCA-1, the 22 RHR Pump will trip and the crew will determine a loss of emergency recirculation capability and

transition to **EOP-LOCA-5**, Loss of Emergency Recirculation. The crew will perform the following actions in LOCA-5; make-up to RWST, stop Containment Spray Pumps, and then reduce ECCS to a single train [**Critical Task #3**].

9. The scenario can be terminated when the crew stops one Charging pump or by direction from Lead Examiner.

IV. INITIAL CONDITIONS

____ **IC-211**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____ 1	2VC1and 2VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	21-24MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	21 and 22 SGFP Trip (SELF CHECK)
____ 7	**21 CV Pump (SELF CHECK)**
____ 8	**21 RHR Pump C/T**
____ 9	**23 Charging pump C/T**
___ 10	**Suggested Protected Equipment:** ▪ **22 RHR Pump**
___ 11	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

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION: COMMAND: PURPOSE:	MONP254 < 10. //CONT ROD BANK C < 10 (RX TRIP) <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	KCK02PBZ //22 VACUUM PUMP-START <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	SG0100C 23 SG PR XMTR (536) PROT CH III FAIL	N/A	N/A	N/A	RT-1	0
_____ 02	RC0015D LOOP 24 COLD LEG RTD FAILS HI/L	N/A	N/A	N/A	RT-3	630
_____ 03	RC0002 RCS LEAK INTO CONTAINMENT (equiv to 0-4 inches)	N/A	0	00:01:00	RT-4	18000
_____ 04	RP0108 FAILURE OF AUTOMATIC SI	N/A	N/A	N/A	N/A	
_____ 05	RP318A2 RHR PUMP 22 Fails to Start on SEC	N/A	N/A	N/A	N/A	
_____ 06	VC0087C TRIP OF VACUUM PUMP 24	N/A	N/A	N/A	RT-2	
_____ 07	RH0026B 22 RHR PUMP TRIP	N/A	N/A	N/A	RT-5	
_____ 08	RC0001A RCS RUPTURE OF RC LOOP 21	N/A	N/A	N/A	ET-1	
_____ 09	VC0087A TRIP OF VACUUM PUMP 22	00:00:02	N/A	N/A	ET-2	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	CV20A 2CV182 BLENDER ISO VLV	N/A	N/A	N/A	RT-10	100
_____ 02	CV21A 2CV184 BLENDER DISC TO RWST	N/A	N/A	N/A	RT-10	100
_____ 03	RH26D 21 RHR PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 04	RH27D 21 RHR PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity
_____ 01	AH03 C1 LO QAH03HRK RWST HEATER PUMP START	00:00:02	N/A	N/A	RT-11	ON

_____ 02	AH03 C2 LO QAH03KGK RWST HEATER PUMP STOP	N/A	N/A	N/A	RT-11	OFF

OTHER 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. SM please inform me when your crew is ready to assume the shift”.

D. Allow sufficient time for panel walk-downs. When informed by the SM 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	Comments
1. **Power Reduction to 89%**			
	CRS briefs crew on power reduction to 89% at 10%/hour IAW S2.OP-IO.ZZ-0004, Section 4.3 Power Reduction.		
	RO briefs boration plan for load reduction.		
	PO briefs turbine load control plan.		
	RO initiates boration IAW S2.OP-SO.CVC-0006.		
	PO initiates turbine load reduction IAW S2.OP-SO.TRB-0002, Turbine Generator Shutdown Operation.		
	RO monitors Tavg and control rods for proper response.		
Proceed to next event by direction from Lead Examiner.			
Examiner's Note: The crew may at any time stop the load reduction to respond to the next events.			
2. 23 SG Pressure Channel 3 Fails Low			
Simulator Operator: Insert **RT-1** on direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
SG0100C, 23 SG PRESS CH 3 FAILS H/L **Value: 0**			
	PO reports unexpected OHA alarms for G-17 LOOP 23 STM LN DP LO and G-33 STM LN PRESS LO, and console alarm for PRESS LO.		
	PO reports the following bistables are lit on 2RP4 for STM LINE DIFFERENTIAL LOOP 23 and LOW STEAMLINE PRESSURE LOOP 23.		
	PO reports 23 SG Pressure Channel 3 has failed low.		
	Crew reviews ARP and determines no operator is required and no impact to plant operation due to failed channel.		
	CRS directs support for removing failed channel from service IAW S2.OP-SO.RPS-0004, Placing SG Channel in Trip Condition.		
TS evaluation #1:			
	CRS enters TS 3.3.2.1.b, Action 19 (72 hours).		
Proceed to next event when Tech Spec has been evaluated or at Lead Examiners direction.			
3. 24 Vacuum Pump Trips:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Simulator Operator: At direction from Lead Evaluator insert **RT-5**. This will trip 24 vacuum pump: **VC0087C, Trip of Vacuum Pump 24**			
	PO reports unexpected trip of 24 Vacuum Pump.		
	CRS enters S2.OP-AB.COND-0001, Loss of Condenser Vacuum.		
	PO initiates Attachment 1 CAS.		
	CRS dispatches operator to perform Attachment 2, Loss of Vacuum Local Checks.		
Role Play: When dispatched to perform Attachment 2, THEN after 2-5 minutes report the following: ***I've completed Attachment 2 and have found no abnormal conditions except for the breaker being tripped open***.			
	PO reports 24 Vacuum pump is stopped and the 24AR25 is closed.		
	PO reports condenser backpressure is rising rapidly.		
	PO reports rising backpressure is not attributed to CW System malfunctions.		
	PO starts all available vacuum pumps.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
22 Vacuum Pump trips following start:			
Simulator Operator: Ensure **ET-2** is TRUE IF 22 Vacuum pump is started. This will cause the pump to trip following start.			
	IF 22 Vacuum Pump is started, the PO reports that the pump started then tripped seconds later.		
25AR25 fails to open following start of 25 Vacuum Pump:			
	PO reports that 25 Vacuum Pump started but the 25AR25 failed to open.		
Role Play: IF requested to check local indications at the Vacuum Pump, THEN report that ***the local gauge reading is SAT and all other parameters are in the SAT range.***			
	PO manually opens 25AR25.		
	PO reports that condenser back pressure is improving.		
Proceed to next event at direction from Lead Examiner.			
4. 24 Loop Cold Leg RTD Fails High			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. **RC0015D, 24 Cold Leg RTD Fails H/L Value = 630**			
	RO reports unexpected continuous rod insertion with no turbine runback in progress.		
Examiner's Note: RO may request to take manual control of Master Flow Controller prior to direction provided in S2.OP-AB.ROD-0003.			
	RO places rod control in Manual.		
	RO reports rod motion has stopped.		
	CRS enters S2.OP-AB.ROD-0003, Continuous Rod Motion.		
	RO reports that 24 RC Loop Tavg Channel has failed high. (may also report DT is reading zero indicating failed high Cold Leg input)		
Examiner's Note: RO could place MFC in Manual at anytime or wait until directed in AB.ROD-0003.			
	RO places Master Flow Controller (MFC) to Manual		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports various 2CC2 console alarms in for: RC Loop Tavg Deviation, Tavg-Tref Deviation, RC Tavg Hi or Lo-Lo, RC Loops DT Dev.		
	CRS confirms control rods are in manual and rod motion has stopped.		
	CRS directs RO to adjust rods in manual to maintain Tavg within 1.5 deg of T program. Any rod manipulation is pre-announced, and the RO monitors control board indications for plant response to rod motion.		
	RO reports rod motion was in the inward direction and a NIS channel has NOT failed.		
	CRS directs RO to stop any dilution in progress.		
	RO reports 24 loop Tavg channel has failed High.		
	CRS directs RO to return PZR level to program.		
	RO places Charging System Master Flow Controller in manual (if not previously performed).		
	RO adjusts charging flow to restore PZR level to program IAW Attachment 2.		
	RO defeats 24 loop Reactor Coolant Differential Temperature and 24 loop Reactor Coolant Average Temperatures on 2CC2.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO selects channel other than 24 loop for Reactor Coolant Differential Temperature and Reactor Coolant Average Temperature.		
	When PZR level has been restored to program, RO places Charging System Master Flow Controller in auto.		
	RO reports control rods are above the rod insertion limit.		
	RO restores control rods to previous position at time of load reduction.		
	RO places rod control in Auto after ensuring Tavg is within 1.5 degrees of Tref.		
TS evaluation #2:			
	CRS enters TS: 3.3.1.1 Action 6 (72 hours) and 3.3.2.1.b Action 19* (72 hours).		
Examiner's Note: Operator actions already performed in AB.ROD-0003, no additional actions in control room, I&C Maintenance is required to complete S2.OP-SO.RPS-0002.			
	CRS initiates S2.OP-SO.RPS-0002 to place 24 loop Tavg in tripped condition.		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
5. RCS Leak			
Simulator Operator: Insert **RT-4** by direction from Lead Examiner. **RC0002, RCS Leakage** **Value = 18000** **Ramp = 1 minute**			
	RO reports unexpected OHA E-28 PZR HTR ON PRESS LO and Console Alarms for PZR LEVEL LO and CONT PRESS HI.		
	RO reports rapidly lowering PZR level and RCS Pressure.		
	RO reports 2R11A is rising.		
	CRS enters S2.OP-AB.RC-0001, RCS Leakage.		
	CRS initiates Attachment 1 CAS and directs RO to: • Trip the Rx • Confirm the Rx is tripped • Initiate Safety Injection		
6. Large Break LOCA			
Simulator Operator: Ensure **ET-1** is TRUE following Rx Trip. This will insert LBLOCA malfunction. **RC0001A, RCS rupture on RC loop 21**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Auto SI fails to actuate on both trains:			
	RO may report SI failed to Auto actuate (depending on where RCS pressure is at during time SI is manually actuated)		
Critical Task-1 (CT-2): Manually actuate SI before transition out of EOP-TRIP-1. **SAT_____ UNSAT_____**			
	RO manually actuates SI on one Train and verifies the other train actuated. [Critical Task #1]		
	RO continues Immediate Actions of TRIP-1: ▪ Reports the Main Turbine is tripped and backs up Main Turbine trip. ▪ Reports all 4KV vital busses energized. ▪ Reports SI has been initiated.		
	CRS and RO verify Immediate Actions complete.		
	CRS directs initiation of the following EOP-TRIP-1 CAS actions when RCS pressure meets the criteria: • **Stops RCPs (1350 psig)** • **Close Charging Mini-flows (1500 psig)**		
	RO announces Rx Trip and Safety Injection on the station PA.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
7. 22 RHR Pump fails to start on SEC signal (21 RHR Pump is C/T):	PO reports ALL Vital Buses are energized.		
	PO reports SEC loading for 2B vital bus is NOT complete.		
	PO reports 22 RHR pump failed to start.		
	PO blocks and resets 2B SEC.		
	RO starts 22 RHR pump. [Critical Task-2]		
Critical Task-2 (CT-5): Manually start one low head ECCS pump before transition out of EOP-TRIP-1. **SAT_____ UNSAT_____**			
	PO throttles AFW flow to no less than 22E4lbm/hr while SG NR levels remain <9%. (15% adverse)		
	PO reports all valve groups in Table B are in their safeguards positions.		
	RO reports containment pressure has NOT remained <15 psig.		
	RO reports Phase B and Spray actuation Auto initiated.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports 22 CS pumps is running.		
	RO reports MSLI Auto initiated.		
	RO reports all valves groups in Table D are in the safeguards positions.		
	PO reports no indication of High Steam flow on 2RP4.		
	PO reports All vital busses are energized.		
	RO reports control room ventilation is in Accident Pressurized Mode.		
	RO reports proper switchgear room ventilation.		
	RO reports 2 CCW pumps are running.		
	RO reports both CCW HXs are in Auto.		
	RO reports RCS pressure is less than 300 psig (420 psig Adverse)		
	RO reports BIT flow >100 gpm, and expected SI pump and RHR pump flows consistent with RCS pressure.		
	PO maintains total AFW flow >22E4 lbm/hr until at least one SG NR level is > 9% (15% adverse), then maintains SG NR levels between 19% and 33%.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Examiner's Note: Based on the pace of the crew, they may perform the following CAS steps sooner or later in EOP-TRIP-1.			
	RO closes charging pump mini flows IAW TRIP-1 CAS when RCS pressure is < 1500 psig with BIT flow established. [TRIP-1 CAS]		
	RO stops RCPs IAW TRIP-1 CAS when RCS pressure is <1350 psig with ECCS flow established. [TRIP-1 CAS]		
	RO reports RCP status, and CRS determines whether a MSLI for temperature control is required.		
	RO reports both RTBs are open.		
	RO reports both PZR PORVs are closed and their block valves are open.		
	Crew identifies when containment pressure rises to 4 psig and adverse numbers are to be used.		
	RO reports RCP status and PZR spray consistent with number of operating RCPs.		
	RO reports RCS pressure < 1350 psig and ECCS flow established.		
	RO trips all RCPs IAW EOP CAS.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO maintains seal injection to all RCPs.		
Examiner's Note: SG pressure could lowering slowly based on the break flow from the LBLOCA.			
	PO reports normal expected SG pressures for current conditions and CRS determines no faulted SGs exist.		
	PO reports no indications of a SGTR exist.		
	RO reports two or more channels in Table F are NOT warning or alarm using P250 computer **OR** reports Containment Pressure > 4 psig.		
EOP-LOCA-1 steps here:			
	CRS transitions to 2-EOP-LOCA-1, Loss of Reactor Coolant.		
Examiner's Note: During LOCA-1, the crew may reach the low RWST alarm (15.2 feet) and then transition to EOP-LOCA-3. IF so, the CAS in LOCA-3 will direct transition to LOCA-5 following the trip of the last remaining RHR Pump.			
Simulator Operator: IF the crew transitions to LOCA-3, THEN insert **RT-6** to trip the 22 RHR Pump.			
	PO reports no indications of faulted SGs.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO maintains total AFW flow >22E4 lbm/hr until at least one SG NR level is > 9% (15% adverse), then maintains SG NR levels between 19% and 33%.		
	PO reports no indications of a SGTR exist.		
	RO resets SI and Phase A isolation.		
	RO resets Phase B isolation.		
	RO opens 21 and 22CA330s.		
	PO resets all SECs.		
	PO reports 230V control centers reset.		
	RO resets SGBD Sample Isolation Bypass and opens 21-24 SS94s.		
	CRS directs chemistry to sample 21-24 SGs for boron and activity.		
	RO reports both PZR PORVs are Closed and Block valves are Open.		
	RO reports subcooling is NOT greater than 0 F.		
	RO reports RHR is not aligned for Cold Leg Recirculation.		
	RO reports RHR flow is > 300 gpm.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Proceed to next event following status of 4KV Vital Buses			
	RO reports All 4KV vital buses are energized from offsite power.		
	PO stops all unloaded EDGs.		
Role Play: IF requested to verify EDG is reset to Auto, THEN state the following: ***EDG is reset for Auto start IAW EOP-APPX-9***. Verify OHA J-4, J-12 and J-20 for associated EDG is cleared. **Simulator Operator**: No Actions.			
8. Trip of 22 RHR Pump (Loss of Emergency Recirculation Capability):			
Simulator Operator: Insert **RT-6** at direction from Lead Examiner to trip the last running RHR Pump. This malfunction will result in the crew entering EOP-LOCA-5. **RH0026B, 22 RHR Pump Trip Value = TRUE**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports that 22 RHR Pump tripped.		
	RO reports NO RHR pumps are available.		
Role Play: IF an operator is dispatched to investigate why 22 RHR pump trip, THEN report the following: ***the breaker tripped on overcurrent (relay flag is dropped).***			
	CRS determines that no RHR Pumps are available and transitions from Step 16 to EOP-LOCA-5, Loss of Emergency Recirculation		
	RO depresses close pushbuttons for 21 and 22 CC16's (CCW to RHR HX outlet valves).		
EOP-LOCA-5 steps here:			
Examiner's Note: **IF** crew transitions to EOP-LOCA-3 at this point, **THEN** LOCA-3 CAS will direct them to EOP-LOCA-5.			
	CRS transitions to 2-EOP-LOCA-5, Loss of Emergency Coolant Recirculation.		
	CRS verifies safeguards reset and all unloaded EDGs stopped.		
	RO reports containment sump level >62% light are illuminated.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports NO train of Emergency Recirculation is available due to no RHR Pumps available.		
	CRS directs investigation into both RHR pump trips.		
	RO reports all <u>available</u> CFCUs are running in low speed.		
Examiner's Note: Critical Task-3 is broken down into a series of three (3) actions to conserve RWST inventory. **Part 1 is stopping CS Pumps** **Part 2 is RWST makeup.** **Part 3 is reducing SI to one train**.			
Examiner's Note: During validations, RWST level was 14.2 ft., Cntmt Pressure was 17 psig, and 4 CFCUs were running.			
	CRS determines <u>NO</u> CS pumps are required to be running at Step 9 IAW Table C.		
Critical Task-3 (CT-29): Makeup to RWST and minimize RWST outflow before ECCS pumps cavitate. **SAT_____ UNSAT_____** **Part 1 is stopping CS Pumps** **Steps shaded are required to complete the CT.**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Part 1 - Stopping CS pumps:			
	RO resets Spray actuation.		
	RO stops 21 AND 22 CS pump. [Critical Task-2, Part 1 complete]		
	RO closes 21 and 22 CS2s.		
Part 2 – Make-up to RWST:			
	RO initiates makeup to the RWST IAW S2.OP-SO.CVC-0006.		
S2.OP-SO.CVC-0006 Section 5.8 steps start here:			
GO TO Page 29 to continue on with LOCA-5 steps.			
	PO directs field operator to start RWST Heater Pump		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Simulator Operator: Insert **RT-11** to simulate RWST Heater Recirc Pump in service bezel illuminated: **AH03 C2: RWST Heater Pump Stop** **Final = Override OFF** **AH03 C1: RWST Heater Pump Start** **Final = Override ON** **Delay = 2 seconds** **NOTIFY** control room when RWST heater recirc pump is in service.			
	PO ensures VCT level is adequate.		
	PO obtains Boric Acid flow setpoint from REM Figure 100B or 100D. (at least ≥ 20 gpm)		
	PO resets COUNT A on makeup flow register to zero IAW Exhibit 1.		
	PO places makeup control mode select in stop		
	PO places 2CV179 in Manual (goes full open)		
	PO places 2CV172 in Manual.		
	PO dispatches field operator to locally check 2BR170 is closed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
Role Play: After 1-2 minutes report 2BR170 is CLOSED. No action needed by Simulator Operator.			
	PO notifies CRS to evaluate TS for applicability.		
	PO starts 22 Primary Water pump.		
	PO dispatches field operator to locally open 2CV182 and 2CV184.		
Simulator Operator: Insert **RT-10** when crew requests 2CV182 and 2CV184 to be locally opened in support of RWST makeup. CV20A, 2CV182 Blender Isol Valve (ramp 30 secs) CV21A, 2CV184 Blender Isol Valve (time delay 30 secs, ramp 30 secs) Value = 100 **NOTIFY** control room when valves are open.			
Examiner's Note: When the 2CV182 and 2CV184 are opened the Primary Water flow counter will start.			
	PO places 22 Boric Acid Pump in Manual/Fast start		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO adjusts 2CV172 flow to the value recorded previously. (at least ≥ 20 gpm)		
	PO closes 21 and 22 CV160 if flow not achieved.		
	PO adjusts 2CV179 to 50 gpm using open/close pushbuttons. [Critical Task-3, Part 2 complete]		
	PO reports makeup to RWST has been initiated.		
Critical Task-3 (CT-29): Makeup to RWST and minimize RWST outflow before ECCS pumps cavitate. **SAT_____ UNSAT_____** **Part 2 is RWST makeup.** **Steps shaded are required to complete the CT.**			
LOCA-5 continued here:			
	PO maintains total AFW flow >22E4 lbm/hr until at least one SG NR level is > 9% (15% adverse), then maintains SG NR levels between 19% and 33%.		
	CRS directs performance of SDM.		
RCS cooldown at 100 F/hr:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	PO plots RCS cooldown.		
	PO reports intact SGs available for cooldown		
	PO reports steam dumps NOT available due to MSLI.		
	PO dumps steam using intact available MS10's		
Part 3 - SI flow reduction to one train:			
	RO reports BIT flow is established.		
	RO stops all but <u>one</u> charging pump. [Critical Task-3, Part 3 complete]		
Critical Task-3 (CT-29): Makeup to RWST and minimize RWST outflow before ECCS pumps cavitate. **SAT_____ UNSAT_____** **Part 3 is reducing SI to one train**. **Steps shaded are required to complete the CT.**			
	RO runs <u>only one</u> SI pump.		
	RO reports No flow on 21 or 22 SJ49 flow meters.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comments
	RO reports no RHR pumps are running.		
Terminate the scenario when the crew stops all but one Charging Pump or at Lead Examiners direction.			

VI. SCENARIO REFERENCES

A. Alarm Response Procedures (various)
B. Technical Specifications
C. Emergency Plan (ECG)
D. S2.OP-AB.COND-0001, Loss of Condenser Vacuum
E. S2.OP-AB.ROD-0003, Continuous Rod Motion
F. S2.OP-AB.RC-0001, RCS Leak
G. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
H. 2-EOP-LOCA-1, Loss of Reactor Coolant
I. 2-EOP-LOCA-5, Loss of Emergency Recirculation

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 100% RCS BORON: 27 ppm MWe 1220

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

NA

REACTIVITY PARAMETERS:

- Rx Plan: To lower Rx power to 89% at 10%/hour add 168 gallons of boric acid along with inserting control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a boration first. Expect D bank at 193 steps when load reduction is complete.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- None

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Load reduction to 89% at 10%/hour in preparation for Main Turbine valve testing.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Hope Creek and Salem 1 are at 100% power.

PRIMARY:

- 23 Charging Pump C/T for pulsation damper replacement.
- 21 RHR Pump C/T for motor bearing inspection.

SECONDARY:

- Heating Steam is aligned to Unit 1
- Polisher is in service
- Blowdown is 35K per loop to 23 Condenser / Flashtank

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

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.

ATTACHMENT 4
SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario #2 REVIEWER: R. Chan

Initials		Qualitative Attributes
R	1.	The scenario has clearly stated objectives in the scenario.
R	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.
R	3.	The scenario consists mostly of related events.
R	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
R	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.
R	6.	The events are valid with regard to physics and thermodynamics.
R	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
R	8.	The simulator modeling is not altered.
R	9.	All crew competencies can be evaluated.
R	10.	The scenario has been validated.
NA	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.
R	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5
ESG CRITICAL TASKS

19-01 NRC Scenario #2

CT #1 (CT-2):

Critical Task: Manually actuate SI before transition out of EOP-TRIP-1.

Basis: See WOG Rev. 2.

CT #2 (CT-5):

Critical Task: Manually start one low head ECCS pump before transition out of EOP-TRIP-1.

Basis: See WOG Rev. 2.

CT #3 (CT-29):

Critical Task: Makeup to the RWST and minimize RWST outflow to the RWST before ECCS pumps cavitate.

This CT is satisfied when the following series of actions are completed to conserve RWST inventory:

1. **Stopping Containment Spray (CS) Pumps**
2. **Initiating RWST make up,**
3. **Reducing SI to one train**

BASIS: See WOG Rev. 2

ATTACHMENT 6

ESG – PSA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

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

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	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

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-3 [AB.CVC, AR.ZZ-2, AB.SW-1, AB.CN-1, AB.LOAD-1, TRIP-1, LOSC-1, TRIP-3]

SCENARIO NUMBER: 19-01 NRC-3

EFFECTIVE DATE: See Approval Below

EXPECTED DURATION: 75 minutes

REVISION NUMBER: 01

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- **New issue** for 16-01 ILOT NRC exam. Incorporated comments from validation. Added 2SW191 unsat valve stroke time (21 charging pump) and 21 ABV Exhaust Fan trip to allow CRS to exercise Tech Specs. Note**:** Based on the minor changes to the scenario and no expected impact to the major event flowpaths and critical tasks, a full re-validation and SBT was not deemed necessary. A partial re-validation was performed on only the added Tech Spec changes on 11-8-17.
- Rev. 01: Modified for 19-01 ILOT NRC Exam. Incorporated NRC comment on 6-4-20 to swap RC Wide Range Pressure fails low with 21 SW Accumulator pressure low from ESG-1 to prevent overlap concerns with SRO Admin JPM task in ESG-1. Added comments from NRC Prep Week.

PREPARED BY:	R. Chan	6-18-20
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	N/A	
	Operations Training Manager	**Date**
APPROVED BY:	N/A	
	Operations Department	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 3

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____3_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-203: 100% power, MOL; 21 SW Pump is C/T.

Turnover: Maintain current power level.

Critical Tasks:

1. Manually trip the reactor before transition to EOP-FRSM-1 is required (see WOG CT-1)
2. Isolate feed and steam flow to faulted SG (see WOG CT-17)

Event No.	Malf. No.	Event Type*	Event Description
1	CV0036	RO (I) CRS (I)	VCT Level Channel 2LT-114 fails high
2	ANN0025	BOP (C) CRS (TS)	21 SW Accumulator Tank low pressure
3	SW0215C SW0339F	RO (C) CRS (C,TS)	23 SW Pump trips and 26 SW Pump fails to start in Auto
4	CN0117C	ALL (C)	23 Condensate Pump trips
5	BF0111A	ALL (M)	21 SG Feed Line Break inside containment
6	RP0058 RP0059A RP0059B RP0060A RP0060B	RO (I) CRS (I)	ATWS
7	VL0446 VL0023	ALL (C)	21 BF19 and 21BF13 fails to close
		ABs	AB.CVC-1 → AR.ZZ-2 → AB.SW-1 → AB.CN-1 → AB.LOAD-1
		EOPs	TRIP-1 → LOSC-1 → TRIP-3

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

Scenario No.: 3

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	1-7
2. Malfunctions after EOP entry (1-2)	2	6,7
3. Abnormal events (2-4)	4	1,2,3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	3	TRIP-1 LOSC-1 TRIP-3
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	NA
7. Preidentified critical tasks (≥2)	2	5,6
8. Tech Specs exercised (≥ 2)	2	2,3

I. 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 the approved station procedures.

B. Given indication of a loss or malfunction of the Charging system DIRECT corrective action for a Charging System malfunction in accordance with the approved station procedures.

C. Given indication of a loss of a SW Pump, PERFORM actions as the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures.

D. Given indication of a loss of a SW Pump, DIRECT corrective action for a SW System malfunction in accordance with the approved station procedures.

E. Given indication of a loss of a Condensate Pump, PERFORM actions as the nuclear control operator to RESPOND to the malfunction in accordance with approved station procedures

F. Given indication of a loss or malfunction of the Condensate system DIRECT corrective action for a Condensate System malfunction in accordance with the approved station procedures

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 the approved station procedures.

H. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures

I. 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 safety injection PERFORM actions as the shift technical advisor to RESPOND to the safety injection in accordance with the approved station procedures.

L. Given the order or indications of a loss of secondary heat sink, perform actions as the nuclear control operator to RESPOND to the loss of heat sink in accordance with the approved station procedures.

M. Given indication of a loss of secondary heat sink, DIRECT the response to the heat sink loss in accordance with the approved station procedures.

N. Given the order or indications of a loss of secondary heat sink, PERFORM actions as the shift technical advisor for a loss of heat sink IAW approved station procedures.

O. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. VCT Level channel fails high (2LT-114)
2. 21 SW Accumulator Tank Pressure Low
3. 23 SW Pump trips and 26 SW Pump fails to auto start
4. 23 Condensate Pump trips
5. 21 Feedwater Line break (inside containment)
6. ATWS
7. 21BF13 fails to close on SI signal
8. Terminate SI

III. SCENARIO SUMMARY

A. The crew will receive the unit at 100% power MOL. 21 SW Pump is C/T for pump repack.

B. Once the crew takes the watch, VCT level channel 2LT-114 will fail high. This will result in the VCT diverting to the CVCS HUT and lowering VCT level. The crew will either recognize lowering VCT level or 2CV35 diverting to the HUT or unexpected Auto make-up (4 minutes later). The CRS will enter **S2.OP-AB.CVC-0001**, Loss of Charging, and will take action to manually align 2CV35 back to VCT.

C. After the VCT level failure is addressed, the crew will receive OHA alarm B-47 for SW Accumulator Tank #21 Trouble. The crew will dispatch an operator to the field to determine the cause of the alarm. Field operator will report that 21 SW Accumulator Tank alarm is for low tank pressure. The crew will determine that 21 SW Accumulator is Inoperable due to low pressure and IAW the Alarm Response Procedure take action to stop and isolate 21 and 22 CFCUs from service. The CRS will enter TS 3.6.1.1 and 3.6.2.3.

D. Following the 21 SW Accumulator issue, 23 SW Pump will trip and the standby 26 SW Pump will fail to Auto start on lowering pressure. The crew will respond by manually starting 26 SW Pump. The CRS may enter **S2.OP-AB.SW-0001**, Loss of SW Header Pressure. The CRS will enter TS 3.7.4 (72 hours).

E. After 23 SW Pump trip is addressed, 23 Condensate Pump will trip. The crew will enter **S2.OP-AB.CN-0001**, Main Feedwater/Condensate System Abnormality, and bypass the condensate polisher system and determine a load reduction to 85% is required. The crew performs load reduction IAW **S2.OP-AB.LOAD-0001**, Rapid Load Reduction.

F. Once the crew has completed the load reduction, 21 SG feed line will break inside containment. A demand for Auto Reactor Trip will occur but the reactor will fail to trip (ATWS). The crew will trip the reactor by opening both rod drive M-G set breakers [**Critical Task #1**] and enter **2-EOP-TRIP-1**, Reactor Trip or Safety Injection.

G. Following entry into **2-EOP-TRIP-1,** the crew will observe that 21 SG feed flow is oscillating with the other SGs indicating approx. 11% steam flow**.** The crew will initiate MSLI for faulted SGs. Following the MSLI, the crew will recognize that 21 SG is the faulted SG and isolate

AFW flow by closing 21AF21 and 21AF11 [**Critical Task #2**]. During TRIP-1, the crew will also recognize that 21BF13 failed to close and take action to manually close. The crew will eventually transition to **2-EOP-LOSC-1, Loss of Secondary Coolant.**

H. While in EOP-LOSC-1, the crew will isolate feed and steam flow to 21 SG **[Critical Task #2].** The crew will transition to **EOP-TRIP-3,** SI Termination**,** to terminate SI by stopping ECCS pumps, isolating BIT flow and placing normal letdown in service.

I. The scenario may be terminated when the crew places normal letdown in service or at direction by Lead Examiner.

J. INITIAL CONDITIONS

____ **IC-203**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
	VC1and VC4 C/T
	RCPs (SELF CHECK)
	RTBs (SELF CHECK)
	MS167s (SELF CHECK)
	500 KV SWYD (SELF CHECK)
	SGFP Trip (SELF CHECK)
	23 CV PP (SELF CHECK)
	21 SW Pump C/T

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

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION:	KBD12TCY //21BF13 FW INLET STOP VALVE CLOSE
		COMMAND:	DMF VL0023
		PURPOSE:	<update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	SW0215C 23 SERVICE WATER PUMP TRIP	N/A	N/A	N/A	RT-3	
_____ 02	SW0339F 26 SW PUMP- Press SW Fails H/L	N/A	N/A	N/A	N/A	PRESS SW FAIL HI
_____ 03	CN0117C 23 CONDENSATE PUMP TRIP	N/A	N/A	N/A	RT-4	
_____ 04	CV0036 VCT LEVEL XMTR LT114 FAILS H/L	N/A	N/A	N/A	RT-1	100
_____ 05	BF0111A 21 FW LINE BREAK INSIDE CNTMT	N/A	N/A	N/A	RT-5	10000
_____ 06	RP0058 FAILURE OF AUTOMATIC RX TRIP	N/A	N/A	N/A	N/A	
_____ 07	RP0059A FAILURE OF MANUAL RX TRIP	N/A	N/A	N/A	N/A	
_____ 08	RP0059B FAILURE OF MANUAL SI/RX TRIP	N/A	N/A	N/A	N/A	
_____ 09	RP0060A FAILURE OF TRAIN "A" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 10	RP0060B FAILURE OF TRAIN "B" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 11	VL0446 21BF19 Fails to Position (0-100%)	N/A	N/A	N/A	RT-5	50
_____ 12	VL0023 21BF13 Fails to Position (0-100%)	N/A	N/A	N/A	N/A	100
_____ 13	AN0025 SER 025 FAILS - :B47 SW ACCUM TANK #21 TROUBLE	N/A	N/A	N/A	RT-2	SER POINT FAILS/OVRD TO ON
_____ 14	VL0569 21SW223 Fails to Position (0-100%)	N/A	N/A	N/A	RT-14	0
_____ 15	VL0570 22SW223 Fails to Position (0-100%)	N/A	N/A	N/A	RT-14	0

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	SW23D 21 SW PUMP BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 02	SW24D 21 SW PUMP RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 03	CV41A VCT PRESSURE CONTROLLER SETPOINT	N/A	N/A	N/A	N/A	25
_____ 04	RP18D Open MAIN RX TRIP BKR A	N/A	N/A	N/A	RT-10	TRIP OPEN
_____ 05	RP19D Open MAIN RX TRIP BKR B	N/A	N/A	N/A	RT-10	TRIP OPEN

_____ 06	MS05A 21MS45 21 STM GEN STM SUP-23 AFP	N/A	10000	00:01:00	RT-11	0
_____ 07	AF01D 23 AUX FP TRIP RESET	N/A	N/A	N/A	RT-12	RESET
_____ 08	CT191-1D 21 CFCU BKR #1 High Speed 125VDC	N/A	N/A	N/A	RT-13	OFF
_____ 09	CT191-2D 21 CFCU BKR #2 High Speed 125VDC	00:00:05	N/A	N/A	RT-13	OFF
_____ 10	CT191-3D 21 CFCU BKR #3 Low Speed 125VDC	00:00:10	N/A	N/A	RT-13	OFF
_____ 11	CT192-1D 22 CFCU BKR #1 High Speed 125VDC	00:00:15	N/A	N/A	RT-13	OFF
_____ 12	CT192-2D 22 CFCU BKR #2 High Speed 125VDC	00:00:20	N/A	N/A	RT-13	OFF
_____ 13	CT192-3D 22 CFCU BKR #3 Low Speed 125VDC	00:00:25	N/A	N/A	RT-13	OFF

OVERRIDES:

SELF-CHECK	**Description**	**Delay Time**	**Initial Value**	**Ramp Time**	**Trigger**	**Condition/ Severity**

OTHER CONDITIONS:

	Description

SEQUENCE OF EVENTS

a. State shift job assignments.

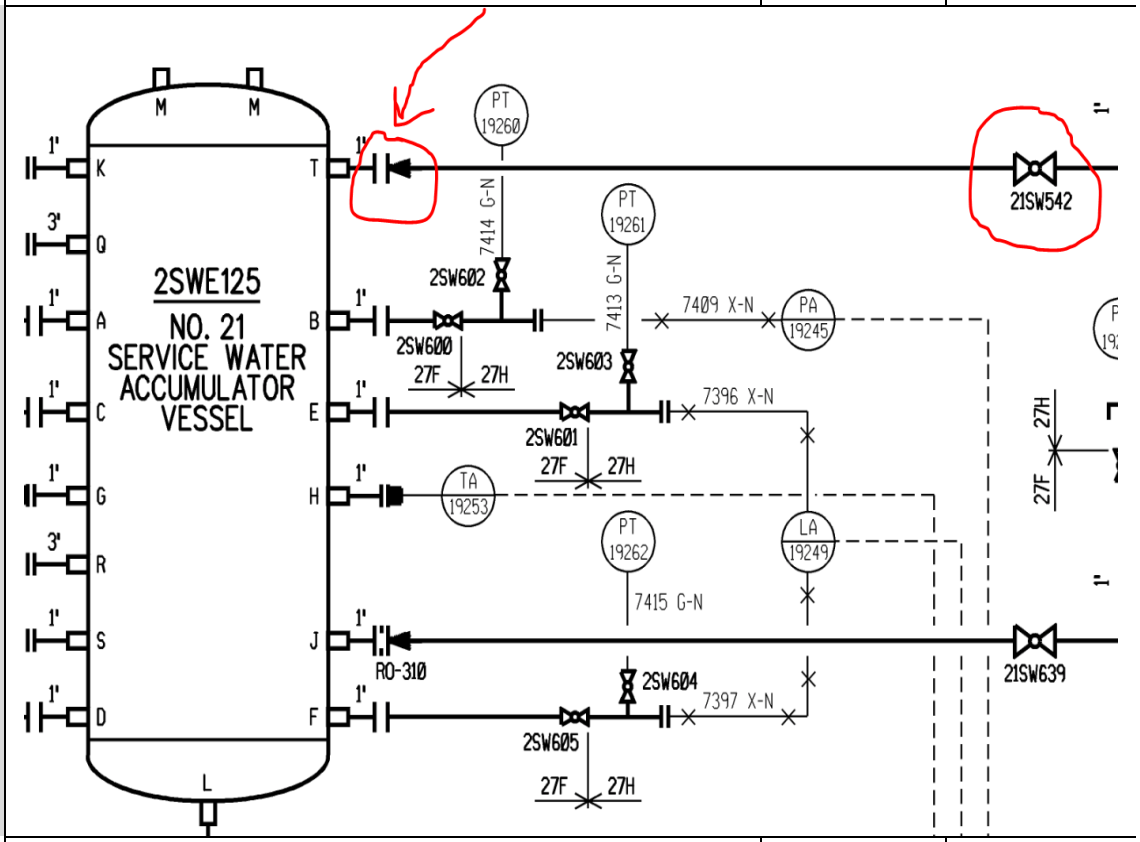
b. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).

c. Inform the crew “The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift”.

d. Allow sufficient time for panel walk-downs. When informed by the SM 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. 2LT-114 VCT Level fails high:			
Simulator Operator: Insert **RT-1** at direction from Lead Examiner. **CV0036, 2LT-114 fails H/L Value = 100**			
Examiner's Note: This malfunction will not result in any alarms except if Auto make-up is initiated. The Lead Examiner may continue to next event at any time.			
	Crew recognizes either VCT level is lowering or 2CV35 is diverted to CVCS HUT.		
	CRS enters S2.OP-AB.CVC-0001, Loss of Charging		
	PO initiates Attachment 1 CAS		
	RO reports 23 Charging pump is running.		
	RO reports no cavitation of Charging Pumps.		
	RO reports no PZR level failure		
	RO reports 2LT-114 has failed high as indicated on the P-250 plant computer.		
Examiner's Note: If operator does not recognize lowering VCT level it will take **approx. 4 minutes** until			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
you get Auto Make-up (11%). Auto make-up will NOT maintain VCT level and eventually the crew will receive console alarm for VCT Level Hi-Lo.			
	RO takes manual control of 2CV35 and positions to VCT.		
	RO reports letdown has not isolated.		
	CRS directs RO to maintain VCT level by either: • Cycling 2CV35, or • Initiating manual make-up IAW S2.OP-SO.CVC-0006		
	RO reports Charging Pump is supplying adequate charging flow.		
	CRS directs RO to place 2CV35 in Auto when cause has been corrected.		
Proceed to next event at Lead Examiner's direction			
2. 21 SW Accumulator Tank Low Pressure			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. This will insert the following malfunction: **AN0025, OHA B-47, 21 SW Accum Tank Trouble**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Crew reports unexpected OHA Alarm B-47, 21 SW Accumulator Tank Trouble.		
	Crew dispatches field operator to investigate cause of alarm.		
Field report on alarm:			
Role Play: After 1-2 minutes, report as the field operator the following: ***the alarm is for low tank pressure and its' reading 137 psig and slowly lowering. I can hear a hissing sound coming from a flanged connection located between the tank and the 21SW542 Nitrogen fill line valve. I don't think it can be isolated***. Reference drawing 205342 Sheet 7 **Notes**: SW Tank is Inoperable when pressure is outside of the band of 138-157 psig (55.2 – 62.8% local) S2.OP-SO.SW-0006 Section 5.5 can be used to make-up Nitrogen pressure to 21 SW Accumulator Tank.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	The crew declares 21 SW Accumulator Inoperable and IAW the Alarm Response Procedure and/or S2.OP-SO.SW-0005, take actions to stop 21 and 22 CFCUs and then isolate them from the field by closing valves in the field.		
	PO stops 21 and 22 CFCUs.		
	The CRS directs WCC supervisor to CLOSE the following field valves: • **21 & 22 SW76, CFCU Outlet Valves** • **21 & 22 SW54, CFCU Inlet Valves**		
Simulator Operator: When notified, Insert **RT-14** to simulate closing of the SW76 and SW54 valves in the field for affected CFCUs: **VL0569, 21SW223 fails to position** **VL0570, 22SW223 fails to position** **Value = 0** Wait 3-5 minutes, THEN Notify the CRS the SW valves are closed.			
Simulator Operator: IF requested to open control power for 21 and 22 CFCU High and Low Speed breakers, THEN INSERT **RT-13**. Location: 84' SWGR Room.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	The crew evaluates Tech Specs due to the low tank pressure.		
TS evaluation #1:			
	The CRS enters TS 3.6.1.1 (1 hour) for Containment Integrity and 3.6.2.3 (14 days) for two CFCUs Inoperable.		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
	The crew may direct field operator to perform make-up to restore SW Accumulator pressure to within specification for Operability IAW S2.OP-SO.SW-0006, SW Accumulator Operation.		
Role Play: IF required, acknowledge the direction to make-up to SW Accumulator Tank using the SO-OP.SW-0006 procedure to restore pressure to within the specified pressure band.			
3. 23 SW Pump trips and 26 SW fails to Auto start:			
Simulator Operator: Enter **RT-3** on direction from Lead Examiner. **SW0215C, 23 SW pump trips** **SW0339F, 26 SW pressure switch fails high**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports unexpected OHA alarms for: • B-13, 21 SW HDR PRESS LO • B-14, 22 SW HDR PRESS LO • B-15, TURB AREA SW HDR PRESS LO		
	RO reports 23 SW Pump tripped and 26 SW Pump in Auto failed to start.		
	RO starts 26 SW pump.		
	RO reports low SW pressure alarms are cleared.		
Examiner's Note: Crew does not have to enter S2.OP-AB.SW-0001 since the only action that the AB requires is to start standby SW Pump.			
	CRS enters S2.OP-AB.SW-0001, Loss of SW Header Pressure		
	PO initiates Attachment 1 CAS		
	PO reports no indication of SW Bay leak.		
	PO starts SW Pumps to maintain header pressure between 95-150 psi.		
	PO reports all SW OHA alarms are cleared.		
	PO reports no indication of leak or valve malfunction on the turbine header.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
TS evaluation #2:			
	CRS enters TS 3.7.4 (72 hours). This is due to having 21 and 23 SW Pumps inoperable in one bay resulting in only one operable SW loop (refer to S2.OP-SO.SW-0005 Attachment 2)		
Proceed to next event at Lead Examiner direction.			
4. 23 Condensate Pump trips:			
Simulator Operator: Insert **RT-4** by direction from Lead Examiner. **CN0117C, 23 condensate pump trips**			
	PO reports 23 Condensate Pump tripped.		
	CRS enters S2.OP-AB.CN-0001, Main Feedwater/Condensate Abnormality.		
	PO initiates Attachment 1 CAS		
	PO reports SGFP did not trip		
	PO reports 23 Condensate Pump tripped.		
Role Play: After 1-2 minutes report the following; ***23 Condensate Pump breaker is open and the overcurrent relay***			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
flag is up.			
	PO reports SGFP suction pressure is less than 320 psig.		
	PO opens 21-23 CN108's (Polisher Bypass valves)		
	PO reports 2CN47 is not open.		
	CRS evaluates plant conditions IAW Attachment 2 section 4.0		
	CRS determines that a load reduction to 85% Rx power at ≤ 5%/min is required.		
	CRS brief load reduction and Reactivity plan.		
	RO initiates boration IAW S2.OP-SO.CVC-0006, Boration Concentration Control.		
	PO initiates load reduction using turbine load control IAW S2.OP-SO.TRB-0001, Turbine-Generator Startup Operations		
	CRS enters S2.OP-AB.LOAD-0001, Rapid Load Reduction.		
	PO initiates Attachment 1 CAS		
	RO maintains Tavg on program IAW Attachment 3		
	RO energizes all PZR heaters.		
	CRS directs WCC to transfer heating steam to Unit 1 IAW SC.OP-SO.HS-0001.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Proceed to next event after the load reduction is complete or at Lead Examiner's direction.			
5. 21 SG Feed Line Break (inside containment):			
Simulator Operator: Insert **RT-5** by direction from Lead Examiner. **BF0111A, 21 SG feedline break inside containment** **Value = 10000**			
ATWS:			
	RO reports demand for First-Out OHA for F-3, 21 SG LVL LO-LO but the Rx failed to Auto trip		
	RO Trips the Rx by opening both M-G set breakers: 2E6D and 2G6D		
Critical Task #1 (CT-1): Manually trip the reactor before transition to EOP-FRSM-1 is required. **SAT _____ UNSAT _____**			
	RO performs immediate actions of EOP-TRIP-1		
	RO reports large oscillating feed flow on 21 SG with		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	no steam flow. All other SGs are indicating approx. 11% steam flow with no feed flow.		
	RO manually initiates MSLI.		
	RO reports Auto SI actuated on CNTMT PRESS HI		
	RO backs up SI signal.		
	RO reports steam (feed) leak is on 21 SG.		
	PO receives permission to throttle AFW flow to no less than 22E4 lbm/hr.		
	PO closes 21AF21 and 21AF11 to isolate faulted 21 SG. [Critical Task #2, Part 1]		
Critical Task # 2 (CT-17): Isolate the faulted SG before transition out of EOP-LOSC-1. **SAT_____ UNSAT_____** This CT is comprised of 2 parts; isolate feed flow and then steam flow later in EOP-LOSC-1.			
	RO reports SEC loading is not complete for B vital bus, but that all available equipment started.		
	PO reports 21 and 22 AFW pumps are operating.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
21BF13 fails to close:			
	RO reports safeguards valve alignment status: • 21BF13 is open • 21BF19 is open		
Simulator Operator: Ensure **ET-1** is TRUE when the 21BF13 closed pushbutton is depressed. This will delete malfunction VL0023.			
	PO manually closes 21BF13.		
Examiner's Note: Closing the 21BF13 will isolate main feed flow from 21 SG into Containment.			
	PO reports may attempt to manually close 21BF19 from the control room using SLIMMs controller, but will be unsuccessful.		
	CRS dispatches operator to attempt to close 21BF19 from the field.		
	RO reports 21 and 22 CA330s are closed.		
	RO reports containment pressure has remained less than 15 psig.		
	PO reports main steam line isolation requirements were met and MSLI previously initiated.		
	PO reports all 4KV vital busses are energized.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports CAV is in Accident Pressurized mode.		
	RO reports correct switchgear room ventilation operation.		
	RO reports 2 CCW pumps are running.		
	RO reports both CCW HXs are in Auto.		
	RO reports correct ECCS pump alignment and expected flows for RCS conditions.		
Examiner's Note: PO should have lowered AFW flow to as close to 22E4 lbm/hr as possible.			
	PO reports AFW flow is >22E4 lbm/hr.		
	RO reports all RCPs are running.		
	RO reports Tavg is not stable and is rising.		
	RO reports Tavg is greater than 547 F.		
	PO controls Tavg by dumping steam using MS10's.		
	RO reports both reactor trip breakers are NOT open.		
Examiner's Note: If the crew does not dispatch an operator to locally open the RTBs, then they will not be able to reset SI and SEC to take control of the ECCS pumps in EOP-LOSC-1, unless they chose to			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
block each SEC signal.			
	CRS directs WCC to locally open both Reactor Trip Breakers.		
Simulator Operator: Insert **RT-10** to locally open both RTBs. **RP18D, Open RTB A** **RP19D, Open RTB B**			
	RO reports both PZR PORVs are closed and block valves are open.		
	PO reports 21 SG pressure is lowering in an uncontrolled manner or completely depressurized.		
	RO reports that MSLI was previously initiated.		
	CRS transitions to 2-EOP-LOSC-1, Loss of Secondary Coolant.		
	RO reports MSLI has been initiated.		
	PO reports all valves in Table A are closed.		
	PO reports 21 SG pressure is dropping in an uncontrolled manner.		
	PO reports that all SGs pressures are NOT dropping in an uncontrolled manner OR completely depressurized.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: 21BF19 is still open. Closing 21BF13 isolates 21 SG main feed flow into Containment, this satisfies CT #2.			
	PO closes or verifies closed the following valves: 21BF13, 21BF40, 21MS7, 21MS10, 21MS18, 21MS167, and 21GB4 [Critical Task #2, Part 2]		
Critical Task # 2, Part 2 (CT-17): Isolate the faulted SG before transition out of EOP-LOSC-1. **SAT_____ UNSAT_____**			
	PO reports that 21 SG is faulted.		
	PO reports that 23 AFW pump is not needed to maintain SG levels.		
	PO lowers 23 AFW pump speed to minimum.		
	PO Trips and then Stops 23 AFW pump.		
Simulator Operator: IF requested, Insert **RT-12** to reset 23 AFW pump 2MS52 trip valve. **AF01D 23 AUX FP TRIP RESET**			
	CRS dispatches operator to close 21MS45.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert **RT-11** to close 21MS45. **MS05A 21 STM GEN SUP-23 AFP** **Final = 0** **Ramp = 1 min**			
	RO resets Phase A.		
	RO resets SG sample isolation bypass.		
	RO opens 21 thru 24 SS94's.		
	CRS directs Chemistry to sample all SGs for boron and activity.		
	RO reports that RCS temperature is rising.		
	PO adjusts MS10's to current intact SG pressure to stabilize RCS temperature.		
	RO reports no NR or WR SG levels are rising in an uncontrolled manner.		
	PO reports that 2R15, 2R19's and 2R46s are not in warning or alarm.		
	RO reports RCS subcooling is > 0 F.		
	PO reports that total AFW flow is NOT > 22E4 lbm/hr (about 3E4 lbm/hr during validations due to NR levels at 9% (15% adverse)).		
	RO reports that RCS pressure is stable or rising.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports that PZR level is > 11% (19% adverse).		
	CRS transitions to EOP-TRIP-3, SI Termination.		
Examiner's Note: At the discretion of the Lead Examiner, the scenario may be terminated when the crew transitions to EOP-TRIP-3.			
Examiner's Note: Need RTBs locally opened to reset SI, if not previously opened in TRIP-1.			
	RO resets SI, Phase A, and Phase B.		
	RO reports both CA330's are open.		
	RO reports that no spray valves are failed open.		
	RO reports all SECs and control centers are reset.		
	RO stops all but 21 or 22 Charging Pump. (this should also include 23 Charging Pump if running)		
	RO reports RCS pressure is stable or rising.		
Normal Charging Alignment:			
	RO reports that charging pump suction is aligned to the RWST.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO opens 2CV139 and 2CV140.		
	RO closes 2SJ4, 2SJ5, 2SJ12, and 2SJ13.		
	RO closes 2CV55.		
	RO opens 2CV68 and 2CV69.		
	RO adjusts 2CV55 to maintain PZR level > 25% (33% adverse)		
	RO reports PZR level is stable or rising.		
	RO reports RCS pressure is stable or rising.		
	RO reports that RCS pressure is > 1540 psig (1660 psig adverse).		
	RO stops 21 and 22 SI pumps.		
	RO reports that both RHR pumps are running and suction aligned to RWST.		
	RO stops 21 and 22 RHR pumps.		
	RO reports RCS subcooling is > 0 F.		
	RO reports PZR level is > 11% (19% adverse).		
	RO reports no CS spray pumps are running.		
Establish Normal Letdown:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports PZR level is > 25% (33% adverse)		
	RO opens 2CV2 and 2CV277.		
	RO opens 2CV7.		
	RO adjusts 2CV55 to maintain > 87 gpm.		
	RO simultaneously places one letdown orifice valve in service while adjusting the 2CV18 to maintain letdown pressure at 300 psig.		
	RO places 2CV18 in Auto.		
	RO reports normal letdown in service.		
Scenario may be terminated when letdown is restored or by direction from Lead Examiner.			

K. SCENARIO REFERENCES

A. Alarm Response Procedures (Various)
B. Technical Specifications
C. Emergency Plan (ECG)
D. OP-AA-101-111-1003, Use of Procedures
E. 2-EOP-TRIP-1, Rx Trip or Safety Injection
F. 2-EOP-LOSC-1, Loss of Secondary Coolant
G. 2-EOP-TRIP-3, SI Termination
H. S2.OP-AB.SW-0001, Loss of SW Header Pressure
I. S2.OP-AB.CVC-0001, Loss of Charging
J. S2.OP-SO.CN-0001, Main Feedwater/Condensate System Abnormality
K. S2.OP-AB.LOAD-0001, Rapid Load Reduction
L. S2.OP-IO.ZZ-0004, Power Operation

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 100% RCS BORON: 802 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:

CONTROL ROOM:

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

PRIMARY:

SECONDARY:

- Polisher in service
- Blowdown 35K per loop to 23 Condenser

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

- 21 SW Pump C/T for pump repack.

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. All printers have adequate paper AND functional ribbon
12. Required procedures clean
____ 13. Multiple color procedure pens available
____ 14. Required keys available
____ 15. Simulator cleared of unauthorized material/personnel
____ 16. All charts advanced to clean traces and chart recorders are on.
____ 17. Rod step counters correct (channel check) and reset as necessary
____ 18. Exam security set for simulator
____ 19. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter
____ with Baseline Data filled out
____ 20. Recording Media available (if applicable)
____ 21. Ensure ECG classification is correct
____ 22. Reference verification performed with required documents available
____ 23. Verify phones disconnected from plant after drill.
____ 24. Ensure ECG related paperwork is marked “For Training Use Only”.

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.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario 3 REVIEWER: R. Chan

Initials		Qualitative Attributes
R	1.	The scenario has clearly stated objectives in the scenario.
R	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.
R	3.	The scenario consists mostly of related events.
R	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
R	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.
R	6.	The events are valid with regard to physics and thermodynamics.
R	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
R	8.	The simulator modeling is not altered.
R	9.	All crew competencies can be evaluated.
R	10.	The scenario has been validated.
N/A	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.
R	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

19-01 NRC Scenario 3

Critical Task #1 (CT-1): Manually initiate Rx Trip before transition to EOP-FRSM-1 is required.

Bases: See WOG Rev. 2

Critical Task #2 (CT-17): Isolate feed and steam flow to faulted SG before transition out of EOP-LOSC-1.

Bases: See WOG Rev. 2

ATTACHMENT 6

ESG-PSA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

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

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	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

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-4 [AB.RAD-1, AB.CN-1, AB.RCP-1, TRIP-1, TRIP-2, SGTR-1]

SCENARIO NUMBER: 19-01 NRC ESG-4

EFFECTIVE DATE: See Approval Dates

EXPECTED DURATION: 70 minutes

REVISION NUMBER: 03

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

New issue for 16-01 ILOT NRC exam.
Rev. 01**:** Incorporated NRC comments from Prep week. Added Tech Spec LCO times. Added clarification that CT#2 is broken down into two parts.
Rev. 02: Modified for 19-01 ILOT NRC exam.
Rev. 03 Incorporated NRC comments from working mtg on 2-14-20. Deleted Loss of Off-site Power to reduce cooldown time in SGTR-1 using steam dumps. Added comments from NRC Prep Week 6-17-20.

PREPARED BY:	R. Chan	6-18-20
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	N/A	
	Operations Training Manager	**Date**
APPROVED BY:	**N/A**	
	Facility Representative	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 4

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____4_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-204: 2% power, BOL; 21 SGFP I/S. 25 CFCU is in low speed to monitor bearing temperatures following maintenance.

Turnover: The crew is directed to continue power ascension to 10% reactor power IAW S2.OP-IO.ZZ-0003 using control rods, steam dumps, and turbine load control.

Critical Tasks:

1. Isolate feed and stem flow to ruptured SG (see WOG CT-18)
2. Cooldown RCS to target temperature (see WOG CT-19)
3. Close PZR PORV block valve on open PORV (see WOG CT-10)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Continue power ascension to 10% IAW IOP-3
2	RM0207A	CRS (TS)	2R1B Control Room Radiation monitor fails high
3	TU0056	RO (C) CRS (TS)	25 CFCU trips in low speed
4	BF0105A	ALL (C)	21 SGFP trips
5	RC42CX RC42CY RC43CX RC43CY	ALL (M)	23 RCP high shaft vibrations
6	SG0078A	ALL (C)	21 SGTR (650 gpm ramped over 5 minutes)
7	SJ0184A	BOP (I) CRS (I)	21 SI Pump fails to start on SEC signal
8	VL0297 VL0298	ALL (C)	PZR PORV fails to close during RCS depressurization
		ABs	IOP-3 → AB.CN-1 → AB.RCP-1 → AB.SG-1
		EOPs	TRIP-1 → TRIP-2 → TRIP-1 → SGTR-1

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

Scenario No.: 4

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	2-8
2. Malfunctions after EOP entry (1-2)	3	6,7,8
3. Abnormal events (2-4)	3	2,3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	TRIP-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	NA
7. Preidentified critical tasks (≥2)	3	CT-18,CT-19, CT-10
8. Tech Specs exercised (≥ 2)	2	2,3

I. OBJECTIVES

A. Given the order, perform actions to raise reactor power IAW S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load.

B. Given indication of a radiation monitor system malfunction, DIRECT the response to the malfunction in accordance with approved station procedures.

C. Given the order or indications of a CFCU tripping, perform actions as the nuclear control operator to RESPOND to the malfunction, IAW approved station procedures.

D. Given the order or indications of a CFCU tripping, DIRECT the response to the malfunction IAW approved station procedures.

E. Given the failure of SGFP, perform actions as the nuclear control operator to RESPOND to the failure IAW S2.OP-AB.CN-0001.

F. Given the failure of SGFP, perform actions as the nuclear control operator to DIRECT the response to the malfunction IAW S2.OP-AB.CN-0001

G. Given the failure of affecting a Reactor Coolant Pump, DIRECT the response to the failure IAW S2.OP-AB.RCP-0001.

H. 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.

I. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with 2-EOP-TRIP-1.

J. 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.

K. Given indication of a safety injection, DIRECT the response to the safety injection in accordance with the approved station procedures.

L. Given the order or indications of a steam generator tube rupture, perform actions as the nuclear control operator to RESPOND to the tube rupture in accordance with the approved station procedures.

M. Given the order or indications of a steam generator tube rupture, DIRECT the response to the tube rupture in accordance with the approved station procedures.

N. Given the order or indications of a ECCS pump failing to start, DIRECT the response to the malfunction in accordance with approved station procedures

O. Given the order or indications of a PZR PORV malfunction, DIRECT the response to the malfunction in accordance with approved station procedures.

II. MAJOR EVENTS

A. Power Ascension

B. 2R1B Control Room Radiation Monitor Channel 1 fails high

C. 25 CFCU trips in low speed

D. 21 SGFP trips and failure of Auto AFW start signal

E. 23 RCP high vibration

F. 21 SG Tube Rupture

G. 21 SI Pump fails to start on SEC signal

H. PZR PORV fails to close during RCS depressurization

III. SCENARIO SUMMARY

A. The crew will take the watch with the unit stable at 2% reactor power during a plant startup, BOL. 21 SGFP is in service and 22 SGFP is not in service. 25 CFCU was declared operable last shift following maintenance. 25 CFCU is in low speed to monitor bearing temperatures every hour following maintenance for next 12 hours. Steam dumps are in Main Steam Pressure Control, Automatic, set at 1000 psig. The crew will be instructed to raise power to 10% and enter Mode 1.

B. The crew will initiate power ascension to 10%, and enter Mode 1, using Main Steam Dumps and control rods IAW **S2.OP-IO.ZZ-0003**, Hot Standby to Minimum Load and S2.OP-SO.MS-0002, Steam Dump System Operation, Attachments 3 or 4.

C. After the crew enters Mode 1 (about 6% Rx power), the 2R1B Channel 1 Control Room Radiation Monitor will fail high. This will result in Control Room Ventilation actuating in Accident Pressurized Mode of operation. The crew will enter **S2.OP-AB.RAD-0001**, Abnormal Radiation. The crew will recognize that the 2R1B channel has failed high and is invalid. The CRS will enter TS 3.3.3.1 Action 28.

D. After the 2R1B channel failure has been addressed, the 25 CFCU operating in low speed will trip on overcurrent protection. The crew will respond by starting the standby CFCU in high speed. The crew will remove control power to the CFCU breakers to comply with Tech Spec containment integrity requirements. The CRS will enter TS 3.6.1.1 and 3.6.2.3 Action a.

E. After the 25 CFCU is addressed, 21 SGFP will trip on high thrust bearing oil pressure. The crew will respond IAW **S2.OP-AB.CN-0001**, Main Feedwater/Condensate System Abnormality. The crew will reduce Rx power to less than 4%. The AFW pumps will fail to Auto start on low SG levels and the crew will respond by manually starting both motor driven AFW pumps or 23 AFW pump. The crew will throttle AFW flow as necessary to maintain SG narrow range levels between 19-33%. Note: the crew may take a conservative action to trip the Rx at this point due to lowering SG narrow range levels. If so, then the next event will occur during EOP-TRIP-2.

F. After the crew addresses the loss of 21 SGFP, 23 RCP will experience elevated shaft vibrations. The CRS will enter **S2.OP-AB.RCP-0001**, RCP Abnormality, and imitate

Attachment 2 for stopping 23 RCP due to exceeding shaft vibrations. The crew will trip the Rx, confirm the Rx is tripped, and stop 23 RCP.

G. The crew will perform immediate actions in **EOP-TRIP-1**, Reactor Trip or Safety Injection, and then transition to **EOP-TRIP-2**, Reactor Trip Response, based on no SI required.

H. Shortly after transition to EOP-TRIP-2, 21 SG will rupture (650 gpm ramped over 5 minutes) and the crew will manually initiate SI and **return to EOP-TRIP-1**. While in EOP-TRIP-1, the crew will identify that 21 SI Pump failed to start. The crew will block and reset 2A SEC and manually start 21 SI Pump.

I. The crew will identify that 21 SG has a tube rupture based on SG narrow range levels rising, and 2R15, Condenser Off gas radiation monitor in alarm, and transition to **EOP-SGTR-1**, Steam Generator Tube Rupture.

J. While in EOP-SGTR-1, the crew will isolate feed and steam flow to the ruptured 21 SG [**Critical Task #1**] and initiate a RCS cooldown [**Critical Task #2**] using steam dumps to the RCS target temperature. The crew will stop the cooldown when the hottest CETs are less than the required RCS cooldown temperature.

K. Following the RCS cooldown to target temperature, the crew will commence depressurization of the RCS using PZR PORVs due to normal spray unavailable (23 RCP stopped). After the crew reaches the depressurization stop criteria, they will close the PZR PORV and recognize that the PORV will not close. The crew will respond by closing the associated PZR PORV block valve [**Critical Task #3**].

L. The scenario may be terminated when the PZR PORV block valve is closed or by direction from the Lead Examiner.

IV. INITIAL CONDITIONS

____ IC-204

PREP 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 SGFP is in service**
____ 9	**IOP-3 open and complete up to step 4.3.18, Power Operation. Attachment 4 is marked up.**
___ 10	**Steam Dumps are in MS Pressure Mode and Auto, and S2.OP-SO.MS-0002 is open and marked up to step 5.4.1**
___ 11	**Rod control in manual.**
___ 12	**25 CFCU running in LOW speed. (System Engineering monitoring remotely using PI)**
___ 13	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

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION: COMMAND: PURPOSE:	KA501DOA //TRAIN "A" - SI OPERATE KEYSWITCH <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	KA701DOA //TRAIN B - SI OPERATE KEYSWITCH <update as needed>
	3	EVENT ACTION: COMMAND: PURPOSE:	KB201PNI //2PR1 RELIEF VALVE-OPEN <update as needed>
	4	EVENT ACTION: COMMAND: PURPOSE:	KB202PNI //2PR2 RELIEF VALVE-OPEN <update as needed>
	5	EVENT ACTION: COMMAND: PURPOSE:	ET_array(1) .OR. ET_array(2) DMF AF0353A <update as needed>
	6	EVENT ACTION: COMMAND: PURPOSE:	ET_array(1) .OR. ET_array(2) DMF AF0353B <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	RM0207A PROCESS RAD MON 2R1B FAILS HIGH	N/A	N/A	N/A	RT-1	
_____ 02	VC0173E 25 CNTMT FAN COIL UNIT TRIP	N/A	N/A	N/A	RT-2	
_____ 03	BF0105A 21 STM GEN FEED PUMP TRIP	N/A	N/A	N/A	RT-3	THRUST BEARING PRESSURE HIGH
_____ 04	SG0078A 21 STEAM GENERATOR TUBE RUPTURE	N/A	50	00:05:00	RT-5	650
_____ 05	VL0297 2PR1 Fails to Position (0-100%)	00:00:05	N/A	N/A	ET-3	100
_____ 06	VL0298 2PR2 Fails to Position (0-100%)	00:00:05	N/A	N/A	ET-4	100
_____ 07	RP318R1 21 SI PMP FAILS TO START ON SEC	N/A	N/A	N/A	N/A	
_____ 08	AF0353A 21 AFP FAILURE TO AUTO START ON ANY (ALL) SIGNALS	N/A	N/A	N/A	N/A	
_____ 09	AF0353B 22 AFP FAILURE TO AUTO START ON ANY (ALL) SIGNALS	N/A	N/A	N/A	N/A	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	CT195-1D 25 CFCU BKR #1 High Speed 125VDC	N/A	N/A	N/A	RT-10	OFF
_____ 02	CT195-2D 25 CFCU BKR #2 High Speed 125VDC	00:00:05	N/A	N/A	RT-10	OFF
_____ 03	CT195-3D 25 CFCU BKR #3 Low Speed 125VDC	00:00:10	N/A	N/A	RT-10	OFF
_____ 04	RC42CX 23 RCP NOMINAL SHAFT x Vibration Reading	N/A	13	00:04:00	RT-4	25
_____ 05	RC42CY 23 RCP NOMINAL SHAFT y Vibration Reading	N/A	5	00:10:00	RT-4	12
_____ 06	RC43CX 23 RCP NOMINAL MOTOR x Vibration Reading	N/A	.5	00:04:00	RT-4	2.5
_____ 07	RC43CY 23 RCP NOMINAL MOTOR y Vibration Reading	N/A	.5	00:10:00	RT-4	2

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

OTHER 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. Power Ascension			
Examiner's Note: The crew will be using S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load, to perform the power ascension. Step 4.3.16 provides guidance on raising reactor power using Steam Dumps IAW S2.OP-SO.MS-0002. The crew can use Attachments 3 or 4 of S2.OP-SO.MS-0002 to operate Steam Dumps. The intent is for the crew to enter Mode 1, ≈ 6% Rx power, THEN; proceed to next event.			
Examiner's Note: Console alarm **RC LOOPS Tavg – Tref DEVIATION** will be in at the time the crew takes the watch. The crew will be provided instructions during turnover that verification of Tavg is 541 F once per 30 minutes until alarm is reset in Control Room Narrative Log is being performed by the extra NCO. This alarm will clear during the power ascension into Mode 1.			
	CRS directs power ascension using Main Steam Dumps in MS Pressure Control and control rods.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: The CRS will direct the crew in the order in which to raise Rx power by withdrawing control rods or raising steam dump demand first.			
	PO raises steam dump demand IAW S2.OP-SO.MS-0002, section 5.4 using Attachments 3 or 4.		
	RO withdraws control rods at the specified increments to maintain Tave on program.		
Examiner's Note: Program Tavg at 10% Rx power is about 549 F. During simulator runs, Steam Dump pressure setting was about 982 psig for a Rx Power of 5.4%.			
	RO announces when NIS indicates 5% Reactor Power and RECORDs time of Mode 1 entry in Control Room Narrative Log.		
Proceed on to next event when Reactor Power is 6% or by direction from Lead Examiner.			
2. 2R1B Channel 1 Control Room Intake Radiation Monitor fails high:			
Simulator Operator: Insert **RT-1** on direction from Lead Examiner. **RM0207A, 2R1B fails H/L** **Value = high**			
	RO announces unexpected OHA alarm for A-6 RMS HI		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RAD OR TRBL.		
	CRS places power ascension on hold.		
	RO reports control room ventilation is in Accident Pressurized mode.		
	CRS enters S2.OP-AB.RAD-0001, Abnormal Radiation.		
	RO reports 2R1B Channel 1 is failed high.		
	RO reports alarm is invalid.		
	PO calls Unit 1 operator to check 1R1B Channel 2 reading.		
Role Play: As the Unit 1 PO report the following: ***both 1R1B Channel 1 and 2 are reading normal.***			
	CRS reviews Tech Specs.		
TS evaluation #1:			
Examiner's Note: When in Accident Pressurized Mode, the intake dampers for 2R1B Ch. 1 and 1R1B Ch. 2 radiation detectors are isolated and therefore, both channels are inoperable. When CAV is reset and dampers are re-opened, the 1R1B Ch. 2 will be Operable and TS Action 27 is then entered for only 2R1B Ch. 1.			
	CRS enters TS 3.3.3.1.b Action 28 (immediately		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	place in Accident Pressurized mode or Recirculation mode of operation)		
	CRS requests assistance in troubleshooting failed RMS channel.		
Proceed to next event after CRS evaluates Tech Specs or by direction from Lead Examiner.			
3. 25 CFCU trips in LOW speed:			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. **VC0173E, 25 CFCU trips**			
	RO reports 25 CFCU tripped in low speed.		
Role Play: If requested to why the CFCU tripped then report after 1 minute: ***the low speed breaker is open and the overcurrent flag is up.*** Location: 84 ft. switchgear room			
	CRS may direct starting 23 CFCU in high speed, if necessary.		
	CRS may review S2.OP-SO.SW-0005, Attachment 5 for operability guidance.		
TS evaluation #2:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS enters TS 3.6.2.3 Action a (14 days) and 3.6.1.1 (1 hour containment integrity until control power is removed)		
	CRS directs WCC to open control power for 25 CFCU high and low speed breakers.		
Simulator Operator: Insert **RT-10** when directed by CRS to open control power to high and low speed 460 V breakers**.** **CT195-1D, 25 CFCU breaker # 1high speed 125 VDC** **CT195-2D, 25 CFCU breaker #2 high speed 125 VDC** **CT195-3D, 25 CFCU breaker #3 low speed 125 VDC**			
Proceed on to next event after control power is removed or by direction from Lead Examiner.			
4. 21 SGFP Trips:			
Simulator Operator: Insert RT-3 on direction from Lead Examiner. **BF0105A, 21 SGFP trips on thrust bearing oil pressure high**.			
	RO reports console alarm for 21 SGFP thrust bearing oil bearing oil pressure high.		
	RO reports 21 SGFP tripped.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: If requested to why feedpump tripped then report after 1 minute: ***first out annunciator has thrust bearing oil pressure high trip locked in and will not clear.***			
Examiner's Note: The crew may take the actions in Step 4.3.18 IAW IOP-3 to reduce Rx power to < 4% and start AFW Pumps which are similar to actions performed in AB.CN-0001.			
	CRS enters S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality		
	CRS determines immediate actions of AB.CN-0001 is not met.		
	PO initiates Attachment 1 CAS.		
	PO reports 21 SGFP tripped.		
	RO reports Reactor Power is 6% or less than P-10 (10%).		
Examiner's Note: Monitor the crew's actions to lower Reactor Power when inserting control rods to observe if reactor goes subcritical.			
	RO reduces Reactor Power to less than 4% by inserting control rods.		
	CRS continues on with procedure.		
	PO reports Aux Feedwater is not in operation.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO sets 21-24 AF21 demands to 0%.		
	PO starts 21 and 22 AFW Pumps.		
	PO adjusts 21-24 AF21's as necessary to maintain SG levels between ± 5% of program.		
Examiner's Note: Depending how the crew feeds the SGs using AFW flow, the CRS may direct to trip the reactor based on SG NR levels approach the Auto Rx Trip setpoint (13%).			
Simulator Operator: IF the crew trips the reactor here, **THEN** insert **RT- 4** for the RCP High Vibration malfunction in **EOP-TRIP-2**.			
Proceed to next event after AFW flow is established or by direction from Lead Examiner.			
5. 23 RCP High Vibration (Major Transient):			
Simulator Operator: Insert **RT-4** on direction from Lead Examiner. **RC42CX, 23 RCP shaft x vibration Value = 5-25** **RC42CY, 23 RCP shaft y vibration Value = 5-12** **RC43CX, 23 RCP motor x vibration Value = 0.5-2.5**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
RC43CY, 23 RCP motor y vibration Value = 0.5-2.0			
	RO reports unexpected OHA alarm D-36 for RCP VIB HI.		
	RO reports 23 RCP vibration is elevated on 2RP3 monitor.		
	CRS enters S2.OP-AB.RCP-0001, RCP Abnormality		
	RO reports 23 RCP shaft vibration exceeds 20 mils.		
	CRS implements the CAS action.		
	RO Trips the Rx.		
	RO Confirms the Rx Trip.		
	RO stops 23 RCP.		
	CRS enters 2-EOP-TRIP-1, Reactor Trip of Safety Injection.		
	RO continues on with immediate actions of TRIP-1.		
	CRS and RO review immediate actions.		
	CRS and RO perform immediate action steps of EOP-TRIP-1 and confirm no Safety Injection is required.		
	PO throttles AFW flow to no less than 22E4		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	lbm/hr.		
	CRS transitions to 2-EOP-TRIP-2, Reactor Trip Response.		
Examiner's Note: CFSTs are in effect when transition out of EOP-TRIP-1 occurs. STA will report to control room 10 minutes after being summoned via page to monitor CFSTs.			
	CRS directs RO and PO to implement the CAS of EOP-TRIP-2.		
Proceed on to next event when crew transitions to EOP-TRIP-2 or by direction from Lead Examiner.			
6. SG Tube Rupture (ramped):			
Simulator Operator: Insert **RT-5** on direction from Lead Examiner. This will insert a SG Tube Leak starting at 50 gpm then escalating to 650 gpm over a 5 minute period. **SG0078A, 21 SGTR** **Value = 50-650 gpm** **Ramp = 5 minutes**			
Record Time SGTR is inserted: **_____**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports RCS pressure and PZR level are lowering.		
	RO reports unexpected OHA alarm A-6 RMS HI RAD OR TRBL.		
	RO reports 2R15 is in Alarm.		
Examiner's Note: Crew can initiate SI without going to AB.SG-1.			
	CRS enters S2.OP-AB.SG-0001, Steam Generator Tube leak		
	CRS implements the CAS action of AB.SG-0001		
	RO initiates Safety Injection.		
	CRS returns to EOP-TRIP-1.		
	RO initiates SI and performs immediate actions of EOP-TRIP-1		
	CRS re-enters EOP-TRIP-1.		
	CRS performs immediate actions of EOP-TRIP-1.		
	CRS directs RO and PO to implement the CAS.		
	PO reports that SEC loading is NOT complete for energized ALL Vital Buses.		
21 SI Pump fails to start on SEC signal:			
	PO reports 21 SI Pump failed to start.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO blocks 2A SEC.		
	PO resets 2A SEC.		
	RO starts 21 SI Pump.		
	PO reports that 21 and 22 AFW pumps are running.		
	PO reports 21 SG NR levels are rising.		
	PO closes 21AF21 and 21AF11 valves. [Critical Task #1, Part 1]		
Critical Task #1, Part 1 (CT-18): Isolate feed flow to ruptured SG within 10 minutes. **SAT _____ UNSAT _____** **Record Time AFW flow isolated:** **_____**			
	If the ruptured SG is known at this point, the PO may request to close the 21AF21 and 21AF11 to isolate feed flow to the ruptured SG.		
	RO reports all valve groups are in safeguards positions.		
	RO reports that containment pressure has remained less than 15 psig.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that 2RP4 does NOT indicate high steam flow coincident with low steam pressure or low-low Tavg.		
	PO reports all 4KV vital buses are energized.		
	RO reports control room ventilation is in Accident Pressurized mode.		
Role Play: When directed to open data logging room doors, state that you will direct an NEO to perform this task.			
	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 >9%, then maintains SG NR level 19-33%.		
	RO reports 21, 22, 24 RCPs are running.		
	RO reports RCS Tcolds are stable or tending to 547 F.		
	RO reports both RTBs are open.		
	RO reports both PZR PORVs are closed.		
	RO reports PZR PORV block valves are open.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 21, 22, 24 RCPs are running (23 RCP stopped previously).		
	RO reports both PZR spray valves are closed.		
	RO reports that RCS pressure is > 1350 psig.		
	RO maintains seal injection flow to all RCPs.		
	PO reports NO SG pressures are dropping in an uncontrolled manner or completely depressurized.		
Examiner's Note: After stopping 23 RCP, NR levels in 23 SG may be also rising. The crew should recognize that this is due to loss of forced circulation in that RC loop and reduced steaming effect in that SG.			
	RO reports that NR level in 21 SG is rising in an uncontrolled manner.		
	CRS transitions to EOP-SGTR-1, Steam Generator Tube Rupture.		
	PO reports NR levels rising in 21 SG.		
	PO sets 21MS10 to 1045 psig.		
	PO reports 21MS18, 21MS7, and 21GB4 are closed.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Critical Task #1, Part 2 (CT-18): Isolate steam flow to ruptured SG. **SAT _____ UNSAT _____**			
	PO closes 21MS167 [Critical Task #1, Part 2]		
	PO reports 21MS167, 21MS18, and 21MS7 are closed.		
	PO reports that 21 SG is ruptured.		
	PO reports 23 AFW Pump is not the only source of feed flow.		
	PO lowers 23 AFW speed to minimum.		
	PO Trips 23 AFW Pump.		
	CRS directs WCC to close 21MS45.		
Simulator Operator: Use **Remote MS05A** to simulate closing 21MS45. Notify CRS when valve is closed.			
	CRS directs WCC to close 2SS321.		
	CRS dispatches operator to shift gland sealing steam to alternate source IAW S2.OP-SO.GS-0001.		
	CRS determines RCS target temperature using Table B (SG press at >1000 psig = 503 F CETs).		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner' Note: Depending on the pace of the crew during EOP-TRIP-2, the crew may have determined that RCS temperature was not being controlled and initiated MSLI. IF this was performed, THEN, the crew will report that NO steam dumps are available and cooldown with intact MS10s. During validation using MS10's it took about 6 mins to reach CET of 503 F.			
	PO reports steam dumps are available.		
	PO places steam dumps in Manual.		
	PO places steam pressure valve demand to 0%.		
	PO places steam dumps in MS PRESS CONTROL.		
	PO adjusts steam pressure valve demand to 25%.		
	When Tavg low-low is reached, PO depresses "Bypass Tavg" pushbuttons.		
	PO dumps steam using steam dumps on intact SGs. [Critical Task #2, Part 1]		
CT#2 (CT-19): Control initial RCS cooldown so that transition from EOP-SGTR-1 does not occur. This CT is broken down into two (2)			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Parts; establishing RCS cooldown and then maintaining RCS temperature. **SAT_____ UNSAT_____**			
	CRS continues on in EOP-SGTR-1.		
	RO reports hottest CETs are not less than RCS cooldown target temp.		
	PO maintains AFW flow > 22E4 lbm/hr until one SG NR level is > 9%, then maintain between 19% and 33%.		
	RO reports power is available to both PZR PORV stop valves.		
	RO reports both PZR PORVs are closed.		
	RO resets SI, Phase A, and Phase B isolation.		
	RO opens 21 and 22 CA330s.		
	PO resets each SEC and associated control centers.		
	RO reports RHR suction is aligned to the RWST.		
	RO stops both RHR pumps.		
	RO reports hottest CETs are not less than RCS target temp.		
	Crew **waits** until hottest CETs are less than RCS		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	target cooldown temp.		
	RO reports hottest CETs less than RCS target cooldown temp.		
Examiner's Note: It will take approx. **5 mins** to reach the RCS target temperature.			
	PO stops the cooldown by placing MS Pressure Control in Auto. [Critical Task #2 - Part 2]		
	CRS directs PO to dump steam to maintain CET temp. less than required.		
	PO reports ruptured SG pressure is stable or rising.		
	RO reports RCS subcooling is greater than 20 F.		
	RO reports normal PZR spray is **NOT** available (23 RCP stopped)		
RCS depressurization using PZR PORVs:			
	RO reports PZR PORV are available.		
	CRS reviews depressurization termination criteria IAW Table E.		
Examiner's Note: Table E Depressurization Criteria below:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
TABLE E RCS DEPRESSURIZATION TERMINATION CRITERIA • BOTH OF THE FOLLOWING: RCS PRESSURE LESS THAN RUPTURED SG PRESSURE AND PZR LEVEL GREATER THAN 11% (19% ADVERSE) OR • PZR LEVEL GREATER THAN 77% (74% ADVERSE) OR • RCS SUBCOOLING 0°F			
	RO opens **ONLY** one PZR PORV.		
	RO reports RCS pressure is lowering.		
	RO reports when depressurization termination criteria is met IAW Table E.		
PZR PORV fails to close:			
	RO closes PZR PORV.		
Simulator Operator: Ensure **ET-3** or **ET-4** is TRUE for the PZR PORV opened. This will insert malfunction to prevent PORV from closing. **ET-3, 2PR1 fails open** **ET-4, 2PR2 fails open**			
	RO reports opened PZR PORV failed to close.		
	RO closes the associated PZR PORV block valve		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	for the open PORV. [Critical task #3]		
Critical Task # 3 (CT-10): Close PZR PORV block valve by completion of step in SGTR-1 that directs closing PZR PORV Block valve. **SAT _____ UNSAT _____**			
	RO reports RCS pressure rising.		
The scenario maybe terminated when the PZR PORV block valve is closed or as directed by the Lead Examiner.			

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.RAD-0001, Radiation System Abnormality
G. S2.OP-SO.MS-0002, Steam Dump System Operation
H. S2.OP-ST.CBV-0003, Containment Systems – Cooling Systems
I. S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality
J. S2.OP-AB.RCP-0001, Reactor Coolant Pump Abnormality
K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
L. 2-EOP-TRIP-2, Reactor Trip Response
M. 2-EOP-SGTR-1, Steam Generator Tube Rupture

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 2 POWER: 2% RCS BORON: 1584 MWe 0

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

N/A

REACTIVITY PARAMETERS

- Control Bank D at 114 steps.
- Reactor Engineering directs use of control rods and steam dumps to raise power to 10%. No Fuel Conditioning Limits are imposed until 50%.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

None

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- 25 CFCU was declared Operable last shift following return from maintenance. The CFCU is running in low speed to monitor bearing temperatures for the next 12 hours per System Engineering request. System Engineering will monitor temperatures remotely.
- S2.OP-IO.ZZ-0003, Hot Standby to Minimum Load complete up to Section 4.3, step 4.3.18 and S2.OP-SO.MS-0002, Steam Dump System Operation is open at (5.4.1)
- Monitoring Tavg > 541 F once per 30 minutes due to RC Loop Tavg – Tref Deviation console alarm in (extra NCO to log).
- Creew to continue Power ascension to 10% using control rods and steam dumps, and enter Mode 1.
- Reactor Engineering is standing by to support power ascension.
- Mode 1 entry is authorized.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.

PRIMARY:

SECONDARY:

- On main feedwater using 21 SGFP; 22 SGFP O/S in standby

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

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.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario #4 REVIEWER: R. Chan

Initials		Qualitative Attributes
RC	1.	The scenario has clearly stated objectives in the scenario.
RC	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.
RC	3.	The scenario consists mostly of related events.
RC	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
RC	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.
RC	6.	The events are valid with regard to physics and thermodynamics.
RC	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
RC	8.	The simulator modeling is not altered.
RC	9.	All crew competencies can be evaluated.
RC	10.	The scenario has been validated.
NA	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.
RC	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

19-01 NRC Scenario #4

1. **Critical Task #1 (CT-18):** Isolate feed and steam flow to ruptured SG before a transition to SGTR-3 occurs.

   Bases: See WOG Rev 2

2. **Critical Task #2 (CT-19):** Control initial RCS cooldown so that transition from EOP-SGTR-1 does not occur due to low subcooling, or severe challenge on CFST Thermal Shock or Shutdown Margin.

   Note: This CT is broken down into two (2) parts that include establishing RCS cooldown and then maintaining RCS temperature.

   Bases: See WOG Rev 2

3. **Critical Task #3 (CT-10):** Close PZR PORV block valve of stuck open PZR PORV by completion of MCA step in SGTR-1 that directs closing PZR PORV block valve.

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

ATTACHMENT 6

ESG-PRA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

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

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	N	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
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

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE: NRC-5 [IOP-4, AB.ROD-3, AR.ZZ-11, TRIP-1, FRHS-1 w/Condensate Recovery using S/Ds]

SCENARIO NUMBER: 19-01 NRC ESG-5

EFFECTIVE DATE: See Approval Below

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 12

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- For previous revision summaries see ESG-1512
- Rev. 10 (5-1-19) (formerly ESG-1811) Modified for 2019 Annual Exam. Deleted Containment pressure malfunction and 2B SEC failure. Added 23 charging pump trip and PZR spray valve failure. Changed initial condition for 21 charging pump C/T to support TS call on 23 charging pump trip.
- Rev. 11 (last used on 2019 Annual ESG-1908). Modified for 19-01 NRC exam.
- Rev. 12 Incorporated NRC comments from 2-14-20 working mtg to reduce the scenario duration. Removed starting 23 CN Pump, 24MS29 failing closed (note: 5%/min ramp rate no longer applicable), 2PT-506 failure, failure of Phase A to actuate, and moved Loss of 2B 4KV bus following Rx Trip. Added 22 ABV Exhaust fan damper failure and 2PT-505 failure. Changed CT-12 to CT-13 MT failure to Auto Trip no MSLI required. Added comments from NRC Prep Week 6-17-20.

PREPARED BY:	R. Chan	7-6-20
	Lead Regulatory Exam Author	**Date**
APPROVED BY:	N/A	
	Operations Training Manager or designee	**Date**
APPROVED BY:	N/A	
	Operations Department	**Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Scenario No.: 5

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____5_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-210: 85% power, EOL; 21 Charging Pump I/S. The following equipment is out of service: 23 Charging Pump C/T for maintenance.

Turnover: 23 Condensate Pump just placed in service following maintenance and commence power ascension to 100% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using dilution, control rods and turbine load control.

Critical Tasks:

1. Manually trip the turbine (see WOG CT-13)
2. Establish condensate feed flow to SGs (see WOG CT-43)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Commence power ascension to 100% at 10% per hour IAW IOP-4
2	TU0055	ALL (C, TS)	2PT-505 turbine inlet pressure channel fails low.
3	ANCGA072	BOP (C) CRS (C,TS)	22 ABV Exhaust Fan discharge damper fails close (low air flow)
4	VL0448	ALL (M)	23BF19 fails closed
5	RP0073 RP0279A RP0279B	ATC (I) CRS (I)	• Main Turbine fails to Auto trip • Auto MSLI fails to actuate
6	EL0145	ATC (I) CRS (I)	2B 4KV Vital Bus de-energizes on bus differential protection (loss of 22 MDAFW Pump)
7	AF0181A	BOP (C) CRS (C)	21 AFW Pump trips following Rx Trip
8	AF0183	ALL (C)	23 AFW Pump trips on overspeed (loss of all AFW flow) during EOP-TRIP-1
		ABs	IOP-4 → AB.ROD-3 → AR.ZZ-11
		EOPs	TRIP-1 → FRHS-1 w/condensate recovery

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

Scenario No.: 5

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	7	2-8
2. Malfunctions after EOP entry (1-2)	4	5,6,7,8
3. Abnormal events (2-4)	2	2,3
4. Major transients (1-2)	1	4
5. EOPs entered/requiring substantive actions (1-2)	1	TRIP-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	FRHS-1
7. Preidentified critical tasks (≥2)	2	CT-13, CT-43
8. Tech Specs exercised (≥ 2)	2	2,3

I. OBJECTIVES

A. Given the order, the crew will commence a power ascension IAW S2.OP-IO.ZZ-0004.

B. Given an instrument failure of 2PT-505, the crew will take actions IAW S2.OP-AB.ROD-0003 and place rods to manual and place steam dumps to MS Pressure Mode. CRS will exercise Tech Specs.

C. Given an indication of loss of air flow for 22 ABV Exhaust fan, the crew will take corrective actions IAW S2.OP-AR.ZZ-0011 and place the standby ABV Exhaust fan in service. CRS will exercise Tech Specs.

D. 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 the approved station procedures.

E. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

F. 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.

G. Given indication of a safety injection DIRECT the response to the safety injection in accordance with the approved station procedures.

H. Given the order or indications of a loss of secondary heat sink, perform actions as the nuclear control operator to RESPOND to the loss of heat sink in accordance with the approved station procedures.

I. Given indication of a loss of secondary heat sink, DIRECT the response to the heat sink loss in accordance with the approved station procedures.

J. Given the order or indications of a loss of secondary heat sink, PERFORM actions as the shift technical advisor for a loss of heat sink IAW approved station procedures.

K. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Power ascension to 100% at 10%/hour.
2. 2PT-505 Turbine Inlet Pressure Channel fails low
3. 22 ABV Exhaust Fan damper fails closed
4. 23BF19 Feedwater Reg Valve fails closed (MT)
5. Main Turbine fails to trip and Auto MSLI fails to actuate.
6. Loss of 2B 4KV Vital Bus (loss of 22 MDAFW Pump).
7. Loss of all AFW flow and recovery by initiating Condensate flow.

III. SCENARIO SUMMARY

A. The crew takes the watch at 84% power, MOL. 23 Condensate Pump has just been placed in service following maintenance. 21 Charging Pump is in service to support tagging of 23 Charging Pump for scheduled maintenance.

B. After the crew takes the watch, the crew commence a power ascension to 100% at 10%/hour. The crew will control RCS temperature by using dilution, control rods and turbine load control.

C. Once the power ascension has commenced, 2PT-505 turbine inlet pressure channel will fail low causing continuous rod insertion. The crew will respond as directed IAW **S2.OP-AB.ROD-0003**, Continuous Rod Motion, by placing control rods in manual. The crew will also place steam dumps in MS Pressure Mode and CRS will enter TS 3.3.2.1 Act 19.

D. Following the 2PT-505 failure, 22 ABV Exhaust Fan damper will fail closed causing low air flow console alarm. The crew will recognize the low air flow and take corrective actions IAW **S2.OP-AR.ZZ-0011**, 2CC1 ARP to stop 22ABV Exhaust Fan and start the standby ABV Exhaust Fan. The CRS will enter TS 3.7.7 Action a.

E. Once the crew addresses the low air flow for 22 ABV Exhaust Fan, 23BF19 will fail closed (ramped). The crew will receive console alarms for level deviation and recognize that the 23BF19 is closing. Attempts to take manual control will be unsuccessful and the crew will manually trip the reactor.

F. Following the Rx Trip, the Main Turbine fails to Auto trip. The crew responds by manually tripping the main turbine using the bezel trip pushbutton as part of immediate actions of **2-EOP-TRIP-1 [Critical Task #1]**. Automatic Safety Injection will occur following Rx Trip based on the main turbine failing to trip and high steam flow.

G. Following reactor trip, the crew will recognize that 21 AFW Pump tripped and the 2B 4KV Vital Bus is de-energized due to Bus Differential protection (results in loss of 22 MDAFW Pump). At the completion of ECCS flow verification, 23 AFW pump will trip on overspeed resulting in no AFW

flow. The crew will transition to **2-EOP-FRHS-1**, Response to Loss of Secondary Heat Sink, when directed in EOP-TRIP-1.

H. While in FRHS-1, the crew will continue to attempts to restore an alternate source of feedwater using **Condensate Recovery path** (SGFPs are not available due to SI signal). The crew will depressurize one steam generator using steam dumps. The crew will establish feed flow to one SG and verify that SG Wide Range levels are rising prior to exiting FRHS-1 **[Critical Task #2].**

I. The Lead Examiner may terminate the scenario after condensate flow has been established and/or WG level is rising.

A. INITIAL CONDITIONS

____ **IC-210**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
	• VC1and VC4 C/T
	• RCPs (SELF CHECK)
	• RTBs (SELF CHECK)
	• MS167s (SELF CHECK)
	• 500 KV SWYD (SELF CHECK)
	• SGFP Trip (SELF CHECK)
	• 21 CV PP (SELF CHECK)
	• **23 Charging Pump C/T**
	• **Suggested Protected Equipment:** ▪ **None**
	• 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

EVENT TRIGGERS:

Initial	ET #	Description	
	1	EVENT ACTION: COMMAND: PURPOSE:	MONP254 < 10. //CONT ROD BANK C < 10 (RX TRIP) <update as needed>
	2	EVENT ACTION: COMMAND: PURPOSE:	KCB02TY6 //TRIP TURBINE DMF RP0073 <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	VL0448 23BF19 Fails to Position (0-100%)	N/A	40	00:01:00	RT-3	0
_____ 02	RP0073 MN TURB. TRIP FAILURES (VARIOUS)	N/A	N/A	N/A	N/A	ALL ABOVE (20/AST,20-2/AST,20-ET) FAIL
_____ 03	RP0279A AUTO MSLIS FAILS TO ACT, TRN A	N/A	N/A	N/A	N/A	
_____ 04	RP0279B AUTO MSLIS FAILS TO ACT, TRN B	N/A	N/A	N/A	N/A	
_____ 05	AF0181A 21 AUX FEEDWATER PUMP TRIP	N/A	N/A	N/A	ET-1	
_____ 06	AF0183 23 AUX FW PMP OVERSPEED TRIP	N/A	N/A	N/A	RT-4	
_____ 07	TU0055 TURBINE INLET PRESS XMTR 505 FAILS H/	N/A	N/A	N/A	RT-1	0
_____ 08	EL0145 LOSS OF 2B 4160V VITAL BUS	N/A	N/A	N/A	ET-1	

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	AF20D 21 AFW PUMP BKR CONTROL POWER	N/A	N/A	N/A	RT-10	OFF
_____ 02	ANCGA072 CGA OVRD 22 AUX BLDG EXH FAN LOW AIR FLOW ALARM	N/A	N/A	N/A	RT-2	OVRD ON

OVERRIDES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition/ Severity

OTHER CONDITIONS:	
	Description

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. SM please inform me when your crew is ready to assume the shift”.

d. Allow sufficient time for panel walk-downs. When informed by the SM 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. Power Ascension to 100%			
	CRS briefs crew on power ascension to 100% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation.		
	RO briefs reactivity plan for power ascension.		
	PO briefs turbine load control plan.		
	RO initiates dilution IAW S2.OP-SO.CVC-0006 or uses control rods.		
	PO imitates turbine load control IAW S2.OP-SO.TRB-0001, Turbine Generator Startup Operation.		
	RO monitors Tavg and control rods for proper response.		
Proceed to next event by direction from Lead Examiner.			
2. 2PT-505 Turbine Inlet Steam Pressure Channel fails low:			
Simulator Operator: Insert **RT-1** by direction from Lead Evaluator. **TU0055, 2PT-505 fails low Value = 0**			
	RO announces rods stepping in at 72 steps per minute, no load reject in progress, and requests to place rod control in manual.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS directs RO to place rods in manual.		
	RO places rod control in manual and reports rod motion has stopped.		
	CRS enters S2.OP-AB.ROD-0003, Continuous Rod Motion.		
	CRS directs RO to maintain Tavg within 1.5°F of Tref, and RO uses manual rod control to control Tavg within that band.		
	RO reports Tavg and NIS channels NOT failed.		
	RO reports rods above the RIL.		
	PO reports PT-505 failed low.		
	PO places Main Steam dumps in MS Pressure Control-Auto.		
TS evaluation #1:			
	CRS enters TSAS 3.3.2.1.b, Action 19 (72 hours).		
	CRS initiates S2.OP-SO.RPS-0006, Main Turbine Channel Trip / Restoration.		
	RO withdraws control rods to ARO position.		
Examiner's Note: Rods will be left in Manual. This should not have any impact to the outcome of the scenario.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Proceed to next event at Lead Examiner's direction.			
3. 22 ABV Exhaust Fan damper fails closed:			
Simulator Operator: Insert **RT-2** on direction from Lead Evaluator. **ANCGA072, 22 ABV Exhaust Fan Low Air Flow Console Alarm** **Value = OVRD ON**			
	RO reports unexpected console alarm for 22 ABV Exhaust Fan "AIR FLOW LOW"		
	PO refers to 2CC1 ARP		
	RO reports 22 ABV Exhaust Fan is running.		
	PO dispatches operator to locally check the status of the breaker.		
Role Play: When directed to check the status of the breaker, THEN state the following after 1 minute: ***the breaker for 22 ABV Exhaust Fan is closed.***			
	RO reports that the Exhaust Filter lineup 21 HEPA (EMERG) and 23 HEPA (NORMAL) is in the proper lineup IAW S2.OP-SO.ABV-0001.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO dispatches operator to locally check the Exhaust Fan Inlet Vanes.		
Role Play: When directed to locally inspect 22 ABV Exhaust Fan Inlet Vanes, THEN report the following after 1-2 minutes: ***2ABV14 inlet vane damper for 22 ABV Exhaust Fan is closed.***			
	CRS determines that Exhaust flow can NOT be restored and directs starting standby fan IAW S2.OP-SO.ABV-0001.		
	PO starts standby 23 ABV Exhaust Fan IAW S2.OP-SO.ABV-0001.		
TS evaluation #2:			
	CRS enters TSAS 3.7.7 Action a (14 day LCO).		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
4. 23BF19 Fails Closed (Major Transient):			
Simulator Operator: Insert **RT-3** at direction from Lead Examiner. **VL0448, 23BF19 fails to position.** **Value = 0** **Ramp = 1 min**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports unexpected OHA alarms for: • G-15 ADFCS TRBL • G-23 21/22 SGFP SPEED DEVIATION • Console Alarm for 23 SG Program Setpoint Deviation		
	PO reports 23BF19 is closing.		
	PO attempts to regain control by placing 23BF19 in Manual.		
	PO reports manual control of 23BF19 unsuccessful.		
	PO reports 23 SG NR levels are lowering and recommends Reactor Trip.		
Examiner's Note: It's acceptable that an Auto Rx Trip occurs before the crew recognizes that the BF19 fails closed.			
	RO manually trips the Reactor and performs immediate actions of EOP-TRIP-1.		
5. Main Turbine Fails to Auto Trip AND MSLI fails to Auto actuate:			
	RO reports that Main Turbine failed to Auto trip.		
	RO reports Main Turbine failed to manually trip using Pistol Grip switch.		
Simulator Operator: Ensure **ET-2** is TRUE when operator depress the Turbine			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Trip Bezel. This will delete malfunction RP0073 and allow the turbine to trip.			
	RO manually trips the main turbine by depressing turbine trip bezel pushbutton. [Critical Task #1]		
Examiner's Note: IF the crew isolates the main turbine by actuating MSLI, this action meets CT #1.			
Critical Task #1 (CT-13): Manually trip the turbine before severe challenge develops to either subcriticality or integrity CFST, or transition to EOP-LOSC-1. **SAT _____ UNSAT _____**			
	RO reports SI Auto actuated and manually backs up SI signal.		
	CRS enters 2-EOP-TRIP-1, Reactor Trip or Safety Injection.		
6 & 7. 21 AFW Pump Trips and Loss of 2B 4KV Vital Bus:			
Simulator Operator: Ensure **ET-1** is TRUE following Rx Trip. This will insert malfunction to trip 21 AFW Pump and Loss			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
of 2B 4KV Vital Bus. **AF0181A, 21 AFW Pump trip** **EL0145, Loss of 2B 4KV Vital Bus**			
	CRS directs PO to throttle AFW flow to no less than 22E4 lbm/hr.		
Simulator Operator: MONITOR SG NR levels. IF any SG NR levels recovers to 6-7 %, **THEN** insert **RT-4** to trip 23 AFW Pump. This will ensure that a valid Heat Sink Red path exists prior to Step 20 in EOP-TRIP-1.			
	PO reports 21 AFW Pump tripped and only 23 AFW Pump is running.		
Simulator Operator: If directed to remove control power for 21 AFW Pump breaker then insert **RT-10**. AF20D, 21 AFW breaker control power. Location: 64 ft. Switchgear A Bus			
Role Play: IF directed to determine why 21 AFW Pump tripped, then after 2-3 minutes report the following: ***the overcurrent relay flag is up for 21 AFW Pump.***			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	CRS and RO review immediate actions.		
Loss of 2B 4KV Vital Bus (loss of 22 AFW Pump):			
	PO reports 2A and 2C Vital Buses are energized.		
	PO reports SEC loading not complete for 2A and 2B bus.		
	PO reports that 21 AFW Pump tripped following Rx Trip.		
	PO reports all available equipment started.		
	PO reports only 23 AFW Pumps is running.		
	PO reports that NOT all valves groups in Table B are in the safeguards position.		
Examiner's Note: Several SI and Feedwater Isolation valves will not be in the safeguards position due to the loss of 2B 460/230 VAC buses. All back-up valves will be in the safeguards position.			
	PO reports several Safety Injection and Feedwater Isolation valves not in position; but their redundant valves are in the safeguards position.		
	PO reports all Phase A valves are in the safeguards position.		
	CRS directs WCC to locally position valves to their safeguards position.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports all Phase A valves are in the safeguards positions with the exception of 2CV284, but its backup valve 2CV116 is closed.		
	RO reports 21 and 22 CA330's are closed.		
	RO reports that containment pressure has remained less than 15 psig.		
	PO reports 2RP4 does not indicate high steam flow with low steam pressure or low-low Tavg.		
	PO reports MSLI may be initiated.		
	PO reports 2B 4KV Vital bus is NOT energized.		
	CRS directs assistance in restoring 2B 4KV Vital Bus IAW S2.OP-AB.4KV-0002 while continuing with EOP.		
Role Play: IF directed to restore 2B 4KV Vital Bus then state the following: ***the event response team will commence troubleshooting to restore 2B bus.***			
	RO reports control room in Accident Pressurize mode.		
	PO reports one switchgear supply fans and one exhaust fan are running.		
	PO starts 23 switchgear supply fan after 2C SEC is blocked and reset.		
	RO reports one CCW pump is running and both CCW HX are in Auto.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Possible Role Play: If directed by crew, state that you will direct NEO to control CCHX temp IAW S2.OP-SO.CC-0002			
Proceed to next event when **ECCS Flow Evaluation** is in progress:			
	RO reports expected ECCS flow for plant conditions.		
8. 23 AFW Pump trips (loss of all AFW flow):			
Simulator Operator: Insert **RT-4** during ECCS flow evaluation steps in TRIP-1. **AF0183, 23 AFW Pump trips**			
	PO reports that 23 AFW Pump tripped.		
Role Play: If requested to why 23 AFW Pump trip, then report that ***investigation is underway and no obvious signs why it tripped, but the trip linkage looks bent.***			
Note: RCS pressure will be low due to the MT failure to trip.			
	PO reports NO AFW flow		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports no SG NR levels are > 9% (15% adverse)		
	PO reports total AFW flow is less than 22E4 lbm/hr.		
	CRS transitions to 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink.		
Examiner's Note: During scenario construction lowest SG WR levels was at ~54% which was sufficient to allow the crew to establish feed using main condensate.			
	PO reports operator action was not cause of AFW flow <22E4 lbm/hr.		
	RO reports RCS pressure is > SG pressure.		
	RO reports RCS Thots > 350°.		
	CRS reads Bleed and Feed criteria. (3 WR levels < 20% (25% Adverse))		
	PO closes all GB4s.		
	RO closes all SS94's.		
	RO stops all RCPs.		
	CRS directs starting MSPI AFW pump.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: When directed to start MSPI AFW pump then after 1-2 minutes report the following: ***the MSPI AFW pump started but tripped on overspeed***.			
	PO reports Condensate System is in service.		
Examiner's Note: Both SGFPs tripped due to Auto SI actuation following MT failure to trip.			
	PO reports NO SGFPs are available (SI actuation) and MSPI pump failed to start.		
	RO reports SI has actuated (Auto initiated following Rx Trip)		
Examiner's Note: Due to the loss of 2B 460/230 VAC bus, several SI valves will not be in the safeguards position, but the back-up valves will.			
	PO verifies SI valve alignment IAW 2-EOP-APPX-3, SI Verification.		
	RO resets SI, Phase A, and Phase B isolation		
	RO opens both CA330s		
	RO resets all SECs and 230V control centers.		
Examiner's Note: FRHS-1 Step 18, Caution Note states: 21 and 23 SG should be steamed last to maximize availability of			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
a steam supply for 23 AFW pump. During simulator runs, 23 SG WRs levels was reading low due to 23BF19 failing closed prior to Rx trip, therefore the crew should select 22 or 24 SG to steam first.			
EOP-FRHS-1 Condensate Recovery steps start here:			
	Crew selects only **ONE** SG for depressurization to < 575 psig.		
Depressurize SGs using Steam Dumps:			
	PO reports steam dumps are available.		
	PO initiates MSLI on all loops **except** the selected SG.		
	PO places steam dumps in Manual.		
	PO adjusts steam pressure valve demand to zero.		
	PO places steam dumps in MS PRESS CONTROL		
	PO adjusts steam pressure valve demand to 25%.		
	When RCS Tavg Low-Low is reached, then the PO depresses “Bypass Tavg” Pushbuttons.		
Depressurize SGs using MS10’s:			
	PO reports steam dumps are NOT available (Note: IF		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	MSLI performed earlier, then steam dumps will not be available.		
	RO initiates MSLI on all Loops.		
	PO fully opens SELECTED SG MS10 relief valve.		
	CRS dispatches operator to open the selected SG BF40 or BF19 valve (120 ft. elev. TGA).		
Simulator Operator: Use the following REMOTES to operate the 22 or 24 SG BF40 or BF19s. **22 BF19: BF02A** **24 BF19: BF04A** **22 BF40: BF06A** **24 BF40: BF08A** **Set Ramp Time = 03:00 mins** **Set Desired Value = 100 for Fully Open or see below:** **Notify control room when selected valve is OPEN**.			
Examiner's Note: During scenario validation using MS10s to lower SG pressures to inject with main condensate took considerable time (**approx. 10 mins**). Condensate flow was established when SG pressure is around 600 psi.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO opens the selected SG BF13.		
Examiners' Note: 21BF13 valve position indication will be lost due to loss of 2B 460/230 VAC bus. This valve is open. The crew may choose 24BF13 since it has power to indication.			
	PO reports that Release selected for selected BF22		
	PO opens 21 and 22 CN48 (SGFP Bypass valves).		
	PO closes 21 and 22 CN32 (SGFP suction valves).		
Examiner's Note: At this point the crew may wait at Step 18.5 of EOP-FRHS-1 until feedflow is achieved or continue on until the EOP directs you back to beginning of EOP until feed flow is achieved.			
Critical Task #2 (CT-43): Establish feedwater flow into at least one SG before Bleed and Feed is required. **SAT:_____ UNSAT:_____** **Steps that are bolded and shaded are necessary to complete the critical task.**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: The crew should verify indication of condensate flow AND SG WR level is rising when determining if Condensate Flow is established. During validation it took approx. **6 mins** to see WR rising when condensate flow was established at 5-6 %.			
Examiner's Note: As the crew is waiting for feed flow to be established, you can expect the PZR PORVs to be cycling as the RCS heats up.			
	PO reports that Condensate flow is established to selected SG or CETs are lowering. [Critical Task #2]		
	CRS directs PO to maintain selected SG pressure to < 575 psig.		
	Crew reports that Bleed and Feed has NOT been initiated and transitions to procedure in effect (2-EOP-TRIP-1)		
The scenario may be terminated after the crew has established condensate flow or by direction from Lead Examiner.			

B. 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-AB.ROD-0003, Continuous Rod Motion
G. S2.OP-AR.ZZ-0011, 2CC1 Alarm Response Procedure
H. 2-EOP-TRIP-1, Reactor Trip or Safety Injection
I. 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 84% RCS BORON: 843 MWe 1020

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

NA

REACTIVITY PARAMETERS

- Rx Plan: To raise Rx power to 100% at 10%/hour add 2200 gallons of water along with withdrawing control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a dilution first.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Commence power ascension to 100% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation following return to service of 23 Condensate Pump.

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

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

PRIMARY:

- 23 Charging Pump is in progress of being C/T for pulsation damper repairs.

SECONDARY:

- 23 Condensate Pump returned from maintenance
- Blowdown 35K per loop to 23 condenser / flashtank
- Polisher in service

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

None

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.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario #5 REVIEWER: R. Chan

Initials		Qualitative Attributes
RC	1.	The scenario has clearly stated objectives in the scenario.
RC	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.
RC	3.	The scenario consists mostly of related events.
RC	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
RC	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.
RC	6.	The events are valid with regard to physics and thermodynamics.
RC	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
RC	8.	The simulator modeling is not altered.
RC	9.	All crew competencies can be evaluated.
RC	10.	The scenario has been validated.
NA	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.
RC	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

19-01 NRC Scenario 5

CT-1 (CT-13):

Critical Task: Manually trip the turbine before a severe challenge develops to either subcriticality or integrity CSF or transition to LOSC-1.

Basis: See WOG Rev. 2

CT-2 (CT-43):

Critical Task: Establish feedwater flow into at least one SG before Bleed and Feed is required.

Basis: See WOG Rev. 2

ATTACHMENT 6

ESG-PSA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

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

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	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