ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:**______________

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Perform a dilution calculation

JTA#: ANO2-RO-CHADD-NORM-3

KA VALUE RO: 4.1 **SRO:** 4.3 **KA REFERENCE:** 2.1.43

APPROVED FOR ADMINISTRATION TO: RO: X **SRO:** ________

TASK LOCATION: INSIDE CR: __________ **OUTSIDE CR:** __________ **BOTH:** X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: RO: ___________ **SRO:** ___________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ **PLANT SITE:** ______ **CLASSROOM:** _____

TESTING METHOD: SIMULATE: ___________ **PERFORM:** ___________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP 2103.004 Soluble Poison Concentration Control Rev. 11

EXAMINEE'S NAME: ____________________________________ **LOGON ID:** ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____________ **UNSATISFACTORY:** _____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ **Start Time** __________ **Stop Time** __________ **Total Time**

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

TASK STANDARD:

Applicant determines that the amount of dilution water required to reach ECB is between 44233-44245.3 gallons.

TASK PERFORMANCE AIDS:

OP 2103.004 Soluble Poison Concentration Control REV. 11
Attachment ‘A.3’and Attachment C.

SIMULATOR INITIAL CONDITIONS:

Plant is in hot standby condition if performed in the Simulator.

EXAMINER NOTES:

Perform a dilution calculation (Manual Method). This admin JPM has the applicant determine the amount of water needed to dilute the RCS from it actual boron concentration to the Estimated Critical Boron Concentration using a manual calculation sheet in the Chemical Addition Procedure.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, “Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration.”

Start Time: _________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1.	Record the following data from initial conditions attachment.	Recorded the following: - 545°F (Tave) - 42% (PZR Level) - 60% (VCT Level) - (Cr_i) = 750 PPM (initial) - (Cr_f) = 350 PPM (final)	N/A SAT UNSAT
(C)	2.	Determine the RC Mass from Attachment C.	Determined RC mass from Attachment C for a PZR level of 42%, 545°F, and 2200 psia. (Mr) = 481980 lb (C)	N/A SAT UNSAT
(C)	3.	Calculate the DI Water Feed Mass.	Calculated the DI Water Feed Mass: M_f = 481980 ln (750/350) M_f = 367336.3 lb (C) Acceptable range: (367300 – 367400 lb)	N/A SAT UNSAT
(C)	4.	Calculate DI water feed volume	Calculate DI water feed volume: F = (M_F) (V_F) (7.48 gal/ft^3) V_F = sv@80°F = 0.0161 ft^3/lb F = (367336.3lb) (0.0161)(7.48) F = 44237.6 gallons (C) Acceptable range: (44233-44245.3 gallons)	N/A SAT UNSAT
END				

Stop Time: _________________

KEY

ATTACHMENT A.3

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = 545 °F
- Pressurizer Level = 42 %
- VCT Level = 60 %
- Initial RCS Boron Conc.(Cr_i) = 750 ppm
- Final Desired RCS Boron Conc.(Cr_F) = 350 ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = 481980 lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$

M_f = ((481980 - 482000)) ln $\left(\frac{750}{350}\right)$

M_f = (367300 - 367400) lb. Acceptable range

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F$ (7.48)

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (M_F) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = ((367300 - 367400) lb.) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (44233 - 44245.3) gal. DI water Acceptable range

Performed By: ______________ Time: ________ Date: ________

Supervisor Review: ______________ Date: ________

KEY

KEY

ATTACHMENT C

REACTOR COOLANT MASS TABLE

ANO - UNIT 2
MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	**100˚F**	**140˚F**	**200˚F**	**240˚F**	**300˚F**	**545˚F**
0	632,303	626,598	614,668	604,785	556,500	462,894
2	633,589	627,885	615,957	606,075	557,617	463,803
4	634,874	629,172	617,246	607,365	558,733	464,711
6	636,160	630,459	618,535	608,656	559,850	465,620
8	637,446	631,746	619,824	609,946	560,966	466,529
10	638,731	633,033	621,113	611,237	562,083	467,438
12	640,017	634,320	622,402	612,527	563,199	468,347
14	641,303	635,607	623,691	613,817	564,315	469,256
16	642,588	636,894	624,980	615,108	565,432	470,165
18	643,874	638,181	626,269	616,398	566,548	471,074
20	645,160	639,468	627,558	617,689	567,665	471,982
22	646,445	640,755	628,847	618,979	568,781	472,891
24	647,731	642,042	630,137	620,270	569,898	473,800
26	649,017	643,329	631,426	621,560	571,014	474,709
28	650,302	644,616	632,715	622,850	572,131	475,618
30	651,588	645,903	634,004	624,141	573,247	476,527
32	652,874	647,190	635,293	625,431	574,364	477,436
34	654,159	648,477	636,582	626,722	575,480	478,345
36	655,445	649,764	637,871	628,012	576,596	479,253
38	656,731	651,051	639,160	629,302	577,713	480,162
40	658,016	652,338	640,449	630,593	578,829	481,071
42	659,302	653,626	641,738	631,883	579,946	481,980
44	660,588	654,913	643,027	633,174	581,062	482,889
46	661,873	656,200	644,316	634,464	582,179	483,798
48	663,159	657,487	645,605	635,754	583,295	484,707

KEY

ATTACHMENT C

ANO - UNIT 2

MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	**100˚F**	**140˚F**	**200˚F**	**240˚F**	**300˚F**	**545˚F**
50	664,445	658,774	646,894	637,045	584,412	485,616
52	665,730	660,061	648,183	638,335	585,528	486,524
54	667,016	661,348	649,472	639,626	586,644	487,433
56	668,302	662,635	650,761	640,916	587,761	488,342
58	669,587	663,922	652,050	642,206	588,877	489,251
60	670,873	665,209	653,339	643,497	589,994	490,160
62	672,159	666,496	654,629	644,787	591,110	491,069
64	673,444	667,783	655,918	646,078	592,227	491,978
66	674,730	669,070	657,207	647,368	593,343	492,887
68	676,016	670,357	658,496	648,658	594,460	493,796
70	677,301	671,644	659,785	649,949	595,576	494,704
72	678,587	672,931	661,074	651,239	596,692	495,613
74	679,873	674,218	662,363	652,530	597,809	496,522
76	681,158	675,505	663,652	653,820	598,925	497,431
78	682,444	676,792	664,941	655,111	600,042	498,340
80	683,730	678,079	666,230	656,401	601,158	499,249
82	685,015	679,366	667,519	657,691	602,275	500,158
84	686,301	680,653	668,808	658,982	603,391	501,067
86	687,587	681,940	670,097	660,272	604,508	501,975
88	688,872	683,227	671,386	661,563	605,624	502,884
90	690,158	684,514	672,675	662,853	606,741	503,793
92	691,444	685,801	673,964	664,143	607,857	504,702
94	692,729	687,088	675,253	665,434	608,973	505,611
96	694,015	688,375	676,542	666,724	610,090	506,520
98	695,301	689,662	677,831	668,015	611,206	507,429
100	696,586	690,949	679,120	669,305	612,323	508,338

KEY

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

The CRS directs, "Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

The CRS directs, "Using OP 2103.004 Attachment A.3 and Attachment C, determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration."

ATTACHMENT A.3

PAGE 1 OF 1

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = ______________________°F
- Pressurizer Level = ______________________%
- VCT Level = ______________________________%
- Initial RCS Boron Conc.(Cr_i) = ____________________ppm
- Final Desired RCS Boron Conc.(Cr_F) = ______________ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = _________________lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

M_f = (________________) ln (________________)
                                          (   )

M_f = __________________lb.

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

F = $M_F V_F$ (7.48)

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (M_F) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (___________________lb.) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = ______________gal. DI water

Performed By: ______________________________ Time: __________ Date: __________

Supervisor Review: ____ Date: __________

ATTACHMENT C

REACTOR COOLANT MASS TABLE

ANO - UNIT 2
MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	100˚F	140˚F	200˚F	240˚F	300˚F	545˚F
0	632,303	626,598	614,668	604,785	556,500	462,894
2	633,589	627,885	615,957	606,075	557,617	463,803
4	634,874	629,172	617,246	607,365	558,733	464,711
6	636,160	630,459	618,535	608,656	559,850	465,620
8	637,446	631,746	619,824	609,946	560,966	466,529
10	638,731	633,033	621,113	611,237	562,083	467,438
12	640,017	634,320	622,402	612,527	563,199	468,347
14	641,303	635,607	623,691	613,817	564,315	469,256
16	642,588	636,894	624,980	615,108	565,432	470,165
18	643,874	638,181	626,269	616,398	566,548	471,074
20	645,160	639,468	627,558	617,689	567,665	471,982
22	646,445	640,755	628,847	618,979	568,781	472,891
24	647,731	642,042	630,137	620,270	569,898	473,800
26	649,017	643,329	631,426	621,560	571,014	474,709
28	650,302	644,616	632,715	622,850	572,131	475,618
30	651,588	645,903	634,004	624,141	573,247	476,527
32	652,874	647,190	635,293	625,431	574,364	477,436
34	654,159	648,477	636,582	626,722	575,480	478,345
36	655,445	649,764	637,871	628,012	576,596	479,253
38	656,731	651,051	639,160	629,302	577,713	480,162
40	658,016	652,338	640,449	630,593	578,829	481,071
42	659,302	653,626	641,738	631,883	579,946	481,980
44	660,588	654,913	643,027	633,174	581,062	482,889
46	661,873	656,200	644,316	634,464	582,179	483,798
48	663,159	657,487	645,605	635,754	583,295	484,707

ATTACHMENT C

ANO - UNIT 2

MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	**250 psia**	**250 psia**	**250 psia**	**250 psia**	**1000 psia**	**2200 psia**
PZR LEVEL (%)	**100˚F**	**140˚F**	**200˚F**	**240˚F**	**300˚F**	**545˚F**
50	664,445	658,774	646,894	637,045	584,412	485,616
52	665,730	660,061	648,183	638,335	585,528	486,524
54	667,016	661,348	649,472	639,626	586,644	487,433
56	668,302	662,635	650,761	640,916	587,761	488,342
58	669,587	663,922	652,050	642,206	588,877	489,251
60	670,873	665,209	653,339	643,497	589,994	490,160
62	672,159	666,496	654,629	644,787	591,110	491,069
64	673,444	667,783	655,918	646,078	592,227	491,978
66	674,730	669,070	657,207	647,368	593,343	492,887
68	676,016	670,357	658,496	648,658	594,460	493,796
70	677,301	671,644	659,785	649,949	595,576	494,704
72	678,587	672,931	661,074	651,239	596,692	495,613
74	679,873	674,218	662,363	652,530	597,809	496,522
76	681,158	675,505	663,652	653,820	598,925	497,431
78	682,444	676,792	664,941	655,111	600,042	498,340
80	683,730	678,079	666,230	656,401	601,158	499,249
82	685,015	679,366	667,519	657,691	602,275	500,158
84	686,301	680,653	668,808	658,982	603,391	501,067
86	687,587	681,940	670,097	660,272	604,508	501,975
88	688,872	683,227	671,386	661,563	605,624	502,884
90	690,158	684,514	672,675	662,853	606,741	503,793
92	691,444	685,801	673,964	664,143	607,857	504,702
94	692,729	687,088	675,253	665,434	608,973	505,611
96	694,015	688,375	676,542	666,724	610,090	506,520
98	695,301	689,662	677,831	668,015	611,206	507,429
100	696,586	690,949	679,120	669,305	612,323	508,338

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 1 **DATE:**______________

SYSTEM/DUTY AREA: CONDUCT OF OPERATIONS

TASK: Perform Azimuthal Power Tilt calculation using the CPC System

JTA#: ANO2-RO-CPC-NORM-4

KA VALUE RO: 4.6 **SRO:** 4.6 **KA REFERENCE:** 2.1.20

APPROVED FOR ADMINISTRATION TO: RO: X **SRO:** ________

TASK LOCATION: INSIDE CR: __________ **OUTSIDE CR:** __________ **BOTH:** X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ **SIMULATOR:**_______ **CLASSROOM:** Perform

POSITION EVALUATED: RO: ___________ **SRO:** ___________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ **PLANT SITE:** ______ **CLASSROOM:** _____

TESTING METHOD: SIMULATE: ___________ **PERFORM:** ___________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05

EXAMINEE'S NAME: ____________________________________ **LOGON ID:** ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____________ **UNSATISFACTORY:** _____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ **Start Time** __________ **Stop Time** __________ **Total Time**

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
  - Channel A 99.89%
  - Channel B 99.85%
  - Channel C 100.10%
  - Channel D 100.12%

TASK STANDARD:

Applicant determines that the Azimuthal Power Tilt T_q is between 0.006 to 0.0072, and that Calculated CPC Azimuthal Tilt Allowance 1.006 to 1.0072.

TASK PERFORMANCE AIDS:

OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05 Supplement 1

EXAMINER NOTES:

Perform an Azimuthal Power Tilt calculation using CPC System. This admin JPM has the applicant perform a required 12 hour surveillance to calculate the CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable, the Azimuthal Power Tilt $T_q = T_{CPC} + T_{COLSS}$, and the Calculated CPC Azimuthal Tilt Allowance = T_q + 1using CPC values for core flux since the normal calculating computer program COLSS is out of service.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

Start Time: _________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2.1)	Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.	In step 2.5 and Section 3.0, recorded the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from the initial JPM conditions T_{COLSS} = 0.0052	N/A SAT UNSAT
	2. (Step 2.2)	Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Neutron Flux Power CPC PID 171 obtained from the initial JPM conditions for all operable CPCs. • Channel A 99.89% = D_1 • Channel B 99.85% = D_2 • Channel C 100.10% = D_3 • Channel D 100.12% = D_4	N/A SAT UNSAT
	3. (Step 2.3)	Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from initial JPM conditions for all operable CPCs. CPC PID 063 = 1.015 for all 4 CPC Channels	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 2.4) (Step 2.4.1)	Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used. CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.	Used the correct formula and calculated Azimuthal Power Tilt (T_{CPC}) for all CPCs operable. $T_{CPC} \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$ $\sqrt{\left[\frac{99.85 - 100.10}{99.85 + 100.10}\right]^2 + \left[\frac{100.12 - 99.89}{100.12 + 99.89}\right]^2}$ $\sqrt{\left[\frac{-0.25}{199.95}\right]^2 + \left[\frac{0.23}{200.01}\right]^2}$ $\underline{0.0017}$ Recorded $T_{CPC} =$ 0.0017 in table 1 of Section 3.0 Acceptable range = 0.001 to 0.002.	N/A SAT UNSAT
EXAMINER'S NOTE: Steps 2.4.2 through 2.4.5 will be NA due to all CPC channels operable.				
(C)	5. (Step 2.5)	Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0. $T_q = T_{CPC} + T_{COLSS}$	Calculated Azimuthal Power Tilt T_q using $T_q = T_{CPC} + T_{COLSS}$ 0.0017 + 0.0052 = 0.0069 Recorded T_q value of 0.0069 in Table 1 of Section 3.0 Acceptable range = 0.006 to 0.0072.	N/A SAT UNSAT
(C)	6. (Step 2.6)	Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance. Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$	Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$ 0.0069 + 1 = 1.0069 Recorded $T_q + 1$ value of 1.0069 in Table 1 of Section 3.0 Acceptable range = 1.006 to 1.0072.	N/A SAT UNSAT
END of JPM				

Stop Time: _________________

SEE KEY ON NEXT 5 PAGES

KEY

SUPPLEMENT 1

AZIMUTHAL POWER TILT CALCULATION USING THE CPC SYSTEM

This attachment is used to document the manual calculation of Azimuthal Tilt required by Technical Specification Surveillance Requirement listed below:

4.2.3 The AZIMUTHAL POWER TILT shall be determined to be within the limit above 20 % of RATED THERMAL POWER by:

b. Calculating the tilt at least once per 12 hours when the COLSS is inoperable.

<u>WHEN</u> COLSS is inoperable, <u>THEN</u> perform this calculation once each shift. A minimum of 3 operable CPCs are required for this calculation.

~~1.0~~ INITIAL CONDITIONS

~~1.1~~ COLSS is inoperable and RATED THERMAL POWER is greater than 20%.

~~1.2~~ At least 3 CPCs are operable.

~~2.0~~ INSTRUCTIONS

~~2.1~~ Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.

~~2.2~~ Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.

~~2.3~~ Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.

KEY

SUPPLEMENT 1

~~2.4~~ Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used.

~~2.4.1~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{99.85 - 100.10}{99.85 + 100.10}\right]^2 + \left[\frac{100.12 - 99.89}{100.12 + 99.89}\right]^2}$$

$$\sqrt{\left[\frac{-0.25}{199.95}\right]^2 + \left[\frac{0.23}{200.01}\right]^2} \quad \underline{0.0017}$$

Acceptable Range 0.001 to 0.002

NA ~~2.4.2~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with D CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{D_3 + D_2 - 2D_1}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \underline{\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA 2.4.3 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with B CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{2D_3 - D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{2(\quad\quad) - \quad\quad - \quad}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \underline{\qquad}$$

NA 2.4.4 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with A CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{2D_4 - D_3 - D_2}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{2(\quad\quad) - \quad\quad - \quad}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \underline{\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA ~~2.4.5~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with C CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{D_4 + D_1 - 2D_2}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{}{}\right]^2 + \left[\frac{}{}\right]^2} \quad \underline{\qquad}$$

~~2.5~~ Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0.

$$T_q \quad T_{CPC} + T_{COLSS}$$

0.0017 + 0.0052

= 0.0069

Acceptable Range
0.006 to 0.0072

~~2.6~~ Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance.

Calculated CPC Azimuthal Tilt Allowance = T_q + 1

= 1.0069

Acceptable Range
1.006 to 1.0072

KEY

KEY

SUPPLEMENT 1

~~3.0~~ ACCEPTANCE CRITERIA

3.1 Data

COLSS Tilt T_{COLSS} 0.0052

Table 1

	CPC A	CPC B	CPC C	CPC D
Neutron Flux Power (Pt. ID 171)	(D_1) 99.89	(D_2) 99.85	(D_3) 100.10	(D_4) 100.12
Azimuthal Tilt Allowance (Pt. ID 063)	1.015	1.015	1.015	1.015
Calculated Azimuthal Power Tilt (from step 2.5)	(T_q) 0.0069	N/A	N/A	N/A
Calculated CPC Azimuthal Tilt Allowance (from step 2.6)	(T_q + 1) 1.0069	N/A	N/A	N/A

3.2 Is Calcul the TS 3.

END OF JPM

NO

3.3 Is Calculated CPC Azimuthal Tilt Allowance less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC?

(circle one) YES NO

3.4 IF No is circled in either question above,

THEN perform following:

3.4.1 Immediately notify Shift Manager.

3.4.2 Refer to Tech Spec 3.2.3 for required actions.

3.4.3 Refer to 2105.001 for steps to change Pt. ID 063 in all operable CPCs as required.

3.4.4 Initiate Condition Report.

PERFORMED BY_______________________ DATE__________

INDEPENDENT REVIEW BY _______________________ DATE__________

KEY

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
  - Channel A 99.89%
  - Channel B 99.85%
  - Channel C 100.10%
  - Channel D 100.12%

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
    - Channel A 99.89%
    - Channel B 99.85%
    - Channel C 100.10%
    - Channel D 100.12%

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 1 **DATE:**______________

SYSTEM/DUTY AREA: CONDUCT OF OPERATIONS

TASK: Perform Azimuthal Power Tilt calculation using the CPC System

JTA#: ANO2-RO-CPC-NORM-4

KA VALUE RO: 4.6 **SRO:** 4.6 **KA REFERENCE:** 2.1.20

APPROVED FOR ADMINISTRATION TO: RO: X **SRO:** ________

TASK LOCATION: INSIDE CR: __________ **OUTSIDE CR:** __________ **BOTH:** X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ **SIMULATOR:**_______ **CLASSROOM:** Perform

POSITION EVALUATED: RO: ___________ **SRO:** ___________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ **PLANT SITE:** ______ **CLASSROOM:** _____

TESTING METHOD: SIMULATE: ___________ **PERFORM:** ___________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05

EXAMINEE'S NAME: ___________________________________ **LOGON ID:** ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____________ **UNSATISFACTORY:** _____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ **Start Time** __________ **Stop Time** __________**Total Time**

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
  - Channel A 99.89%
  - Channel B 99.85%
  - Channel C 100.10%
  - Channel D 100.12%

TASK STANDARD:

Applicant determines that the Azimuthal Power Tilt T_q is between 0.006 to 0.0072, and that Calculated CPC Azimuthal Tilt Allowance 1.006 to 1.0072.

TASK PERFORMANCE AIDS:

OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05 Supplement 1

EXAMINER NOTES:

Perform an Azimuthal Power Tilt calculation using CPC System. This admin JPM has the applicant perform a required 12 hour surveillance to calculate the CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable, the Azimuthal Power Tilt $T_q = T_{CPC} + T_{COLSS}$, and the Calculated CPC Azimuthal Tilt Allowance = T_q + 1using CPC values for core flux since the normal calculating computer program COLSS is out of service.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

Start Time: _________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2.1)	Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.	In step 2.5 and Section 3.0, recorded the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from the initial JPM conditions T_{COLSS} = 0.0052	N/A SAT UNSAT
	2. (Step 2.2)	Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Neutron Flux Power CPC PID 171 obtained from the initial JPM conditions for all operable CPCs. • Channel A 99.89% = D_1 • Channel B 99.85% = D_2 • Channel C 100.10% = D_3 • Channel D 100.12% = D_4	N/A SAT UNSAT
	3. (Step 2.3)	Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from initial JPM conditions for all operable CPCs. CPC PID 063 = 1.015 for all 4 CPC Channels	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 2.4) (Step 2.4.1)	Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used. CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.	Used the correct formula and calculated Azimuthal Power Tilt (T_{CPC}) for all CPCs operable. $T_{CPC}\ \sqrt{\left[\frac{D_2-D_3}{D_2+D_3}\right]^2+\left[\frac{D_4-D_1}{D_4+D_1}\right]^2}$ $\sqrt{\left[\frac{99.85-100.10}{99.85+100.10}\right]^2+\left[\frac{100.12-99.89}{100.12+99.89}\right]^2}$ $\sqrt{\left[\frac{-0.25}{199.95}\right]^2+\left[\frac{0.23}{200.01}\right]^2}\ \underline{0.0017}$ Recorded $T_{CPC} =$ <u>0.0017</u> in table 1 of Section 3.0 Acceptable range = 0.001 to 0.002.	N/A SAT UNSAT
<u>EXAMINER'S NOTE:</u> Steps 2.4.2 through 2.4.5 will be NA due to all CPC channels operable.				
(C)	5. (Step 2.5)	Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0. $T_q = T_{CPC} + T_{COLSS}$	Calculated Azimuthal Power Tilt T_q using $T_q = T_{CPC} + T_{COLSS}$ 0.0017 + 0.0052 = <u>0.0069</u> Recorded T_q value of <u>0.0069</u> in Table 1 of Section 3.0 Acceptable range = 0.006 to 0.0072.	N/A SAT UNSAT
(C)	6. (Step 2.6)	Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance. Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$	Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$ 0.0069 + 1 = <u>1.0069</u> Recorded $T_q + 1$ value of <u>1.0069</u> in Table 1 of Section 3.0 Acceptable range = 1.006 to 1.0072.	N/A SAT UNSAT
END of JPM				

Stop Time: ________________

SEE KEY ON NEXT 5 PAGES

KEY

SUPPLEMENT 1

AZIMUTHAL POWER TILT CALCULATION USING THE CPC SYSTEM

This attachment is used to document the manual calculation of Azimuthal Tilt required by Technical Specification Surveillance Requirement listed below:

4.2.3 The AZIMUTHAL POWER TILT shall be determined to be within the limit above 20 % of RATED THERMAL POWER by:

b. Calculating the tilt at least once per 12 hours when the COLSS is inoperable.

WHEN COLSS is inoperable, THEN perform this calculation once each shift. A minimum of 3 operable CPCs are required for this calculation.

1.0 INITIAL CONDITIONS

1.1 COLSS is inoperable and RATED THERMAL POWER is greater than 20%.

1.2 At least 3 CPCs are operable.

2.0 INSTRUCTIONS

2.1 Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.

2.2 Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.

2.3 Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.

KEY

SUPPLEMENT 1

~~2.4~~ Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used.

~~2.4.1~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{99.85 - 100.10}{99.85 + 100.10}\right]^2 + \left[\frac{100.12 - 99.89}{100.12 + 99.89}\right]^2}$$

$$\sqrt{\left[\frac{-0.25}{199.95}\right]^2 + \left[\frac{0.23}{200.01}\right]^2} \quad \underline{0.0017}$$

Acceptable Range 0.001 to 0.002

NA ~~2.4.2~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with D CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{D_3 + D_2 - 2D_1}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \underline{\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA ~~2.4.3~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with B CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{2D_3 - D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{2(\quad) - \quad - \quad}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{}{}\right]^2 + \left[\frac{}{}\right]^2} \quad \underline{\qquad}$$

NA ~~2.4.4~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with A CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{2D_4 - D_3 - D_2}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{2(\quad) - \quad - \quad}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{}{}\right]^2 + \left[\frac{}{}\right]^2} \quad \underline{\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA ~~2.4.5~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with C CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{D_4 + D_1 - 2D_2}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \_\_\_\_$$

~~2.5~~ Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0.

$$T_q \quad T_{CPC} + T_{COLSS}$$

0.0017 + 0.0052

= 0.0069

Acceptable Range
0.006 to 0.0072

~~2.6~~ Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance.

Calculated CPC Azimuthal Tilt Allowance = T_q + 1

= 1.0069

Acceptable Range
1.006 to 1.0072

KEY

KEY

SUPPLEMENT 1

~~3.0~~ ACCEPTANCE CRITERIA

3.1 Data

COLSS Tilt T_{COLSS} 0.0052

Table 1

	CPC A	CPC B	CPC C	CPC D
Neutron Flux Power (Pt. ID 171)	(D_1) 99.89	(D_2) 99.85	(D_3) 100.10	(D_4) 100.12
Azimuthal Tilt Allowance (Pt. ID 063)	1.015	1.015	1.015	1.015
Calculated Azimuthal Power Tilt (from step 2.5)	(T_q) 0.0069	N/A	N/A	N/A
Calculated CPC Azimuthal Tilt Allowance (from step 2.6)	(T_q + 1) 1.0069	N/A	N/A	N/A

3.2 Is Calcul the TS 3.

END OF JPM

NO

3.3 Is Calculated CPC Azimuthal Tilt Allowance less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC?

(circle one) YES NO

3.4 IF No is circled in either question above,

THEN perform following:

3.4.1 Immediately notify Shift Manager.

3.4.2 Refer to Tech Spec 3.2.3 for required actions.

3.4.3 Refer to 2105.001 for steps to change Pt. ID 063 in all operable CPCs as required.

3.4.4 Initiate Condition Report.

PERFORMED BY____________________ DATE__________

INDEPENDENT REVIEW BY ____________________ DATE__________

KEY

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
    - Channel A 99.89%
    - Channel B 99.85%
    - Channel C 100.10%
    - Channel D 100.12%

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
    - Channel A 99.89%
    - Channel B 99.85%
    - Channel C 100.10%
    - Channel D 100.12%

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 through step 3.1.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:**______________

SYSTEM/DUTY AREA: EQUIPMENT CONTROL

TASK: Perform Identification of boundary isolations and electrical power to tagout a Boric Acid Makeup Pump

JTA#: **ANO-RO-ADMIN-NORM-078**

KA VALUE RO: 3.9 SRO: 4.3 KA REFERENCE: 2.2.15

APPROVED FOR ADMINISTRATION TO: RO: X SRO: _________

TASK LOCATION: INSIDE CR: __________ OUTSIDE CR: __________ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ SIMULATOR:________ CLASSROOM: Perform

POSITION EVALUATED: RO: ___________ SRO: ___________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ PLANT SITE: ______ CLASSROOM: _____

TESTING METHOD: SIMULATE: ___________ PERFORM: ___________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCE(S): OP-2107.002 ESF Electrical System OPS Rev. 37 Attachment 2B62; PID Drawing M-2231 Sheet 2; E-Print E-2241 Sheet1A

EXAMINEE'S NAME: ____________________________________ LOGON ID: ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____________ UNSATISFACTORY: _____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ Start Time __________ Stop Time __________Total Time

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The Unit is at 100% Power
- An excessive pump seal leak is present on Boric Acid Makeup Pump 2P-39B.
- A Danger Tag will need to be generated to isolate this pump seal leak.
- No pump drains or vents are required to be tagged at this time.

TASK STANDARD:

The examinee has correctly identified the fluid boundary isolations and electrical power needed to isolate the pump seal leak on Boric Acid Makeup Pump 2P-39B along with the required component positions.

TASK PERFORMANCE AIDS:

OP-2107.002 ESF Electrical System OPS Rev. 37 Attachment 2B62; Electrical E-Print E-2241 Sheet1A; Mechanical PID Drawing M-2231 Sheet 2.

EXAMINER NOTES:

Perform Identification of components that need to be used to prepare a tagout on Boric Acid Makeup Pump 2P-39B pump to repair a seal leak. This admin JPM has the applicant review controlled electrical E-prints, procedures and mechanical P&ID drawings to determine what the isolations boundaries will be to tag out the 2P-39B Boric Acid Makeup Pump to repair a pump seal leak.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS has directed you to identify the components that need to be danger tagged to electrically and mechanically isolate Boric Acid Makeup Pump 2P-39B to isolate the pump seal leak. Also provide the component danger tag position required.

Start Time: ________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINERS NOTE: Applicant may add the pump control switch as a component to be placed in "Pull to Lock" but this will not be a Danger Tag and is not a critical boundary for isolating the BAM Pump.				
(C)	1.	Review controlled documentation to determine the source of power to BAM Pump 2P-39B to add to the tagout (E-Print E-2241 Sheet 1A or OP-2107.002 ESF Electrical System OPS Attachment 2B62)	Reviewed E-Print E-2241 Sheet 1A and/or OP-2107.002 ESF Electrical System OPS Attachment 2B62. Determined that Electrical Circuit Breaker **2B62-B6** will need to be **"OPENED"** to electrically isolate BAM Pump 2P-39B	N/A SAT UNSAT
(C)	2.	Review controlled documentation to determine the required isolation valves needed for BAM Pump 2P-39B pump seal leak. (Mechanical P&ID M-2231 Sheet 2)	Reviewed Mechanical P&ID M-2231 Sheet 2. Determined that BAM Pump 2P-39B Discharge Isolation **2CVC-40B** will need to be **CLOSED** to isolate the seal leak	N/A SAT UNSAT
(C)	3.	Review controlled documentation to determine the required isolation valves needed for BAM Pump 2P-39B pump seal leak. (Mechanical P&ID M-2231 Sheet 2)	Reviewed Mechanical P&ID M-2231 Sheet 2. Determined that BAM Pump 2P-39B Minimum Recirc Isolation Valve **2CVC-53B** will need to be **CLOSED** to isolate the seal leak	N/A SAT UNSAT
(C)	4.	Review controlled documentation to determine the required isolation valves needed for BAM Pump 2P-39B pump seal leak. (Mechanical P&ID M-2231 Sheet 2)	Reviewed Mechanical P&ID M-2231 Sheet 2. Determined that BAM Pump 2P-39B Recirc Isolation Valve **2CVC-54B** will need to be **CLOSED** to isolate the seal leak	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	53.	Review controlled documentation to determine the required isolation valves needed for BAM Pump 2P-39B pump seal leak. (Mechanical P&ID M-2231 Sheet 2)	Reviewed Mechanical P&ID M-2231 Sheet 2. Determined that BAM Pump 2P-39B Suction Isolation **2CVC-39B** will need to be **CLOSED** to isolate the seal leak	N/A SAT UNSAT
END				

Stop Time: _________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- An excessive pump seal leak is present on Boric Acid Makeup Pump 2P-39B.
- A Danger Tag will need to be generated to isolate this pump seal leak.
- No pump drains or vents are required to be tagged at this time.

INITIATING CUE:

The SM/CRS has directed you to identify the components that need to be danger tagged to electrically and mechanically isolate Boric Acid Makeup Pump 2P-39B to isolate the pump seal leak. Also provide the component danger tag position required.

EXAMINER ANSWER KEY

Critical	Component #	Component Name	Component Position
(C)	2B62-B6	BAM Pump 2P-39B Electrical Circuit Breaker	OPENED
(C)	2CVC-40B	BAM Pump 2P-39B Discharge Isolation Valve	CLOSED
(C)	2CVC-53B	BAM Pump 2P-39B Minimum Recirculation Isolation Valve	CLOSED
(C)	2CVC-54B	BAM Pump 2P-39B Recirculation Isolation Valve	CLOSED
(C)	2CVC-39B	BAM Pump 2P-39B Suction Isolation Valve	CLOSED

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- An excessive pump seal leak is present on Boric Acid Makeup Pump 2P-39B.
- A Danger Tag will need to be generated to isolate this pump seal leak.
- No pump drains or vents are required to be tagged at this time.

INITIATING CUE:

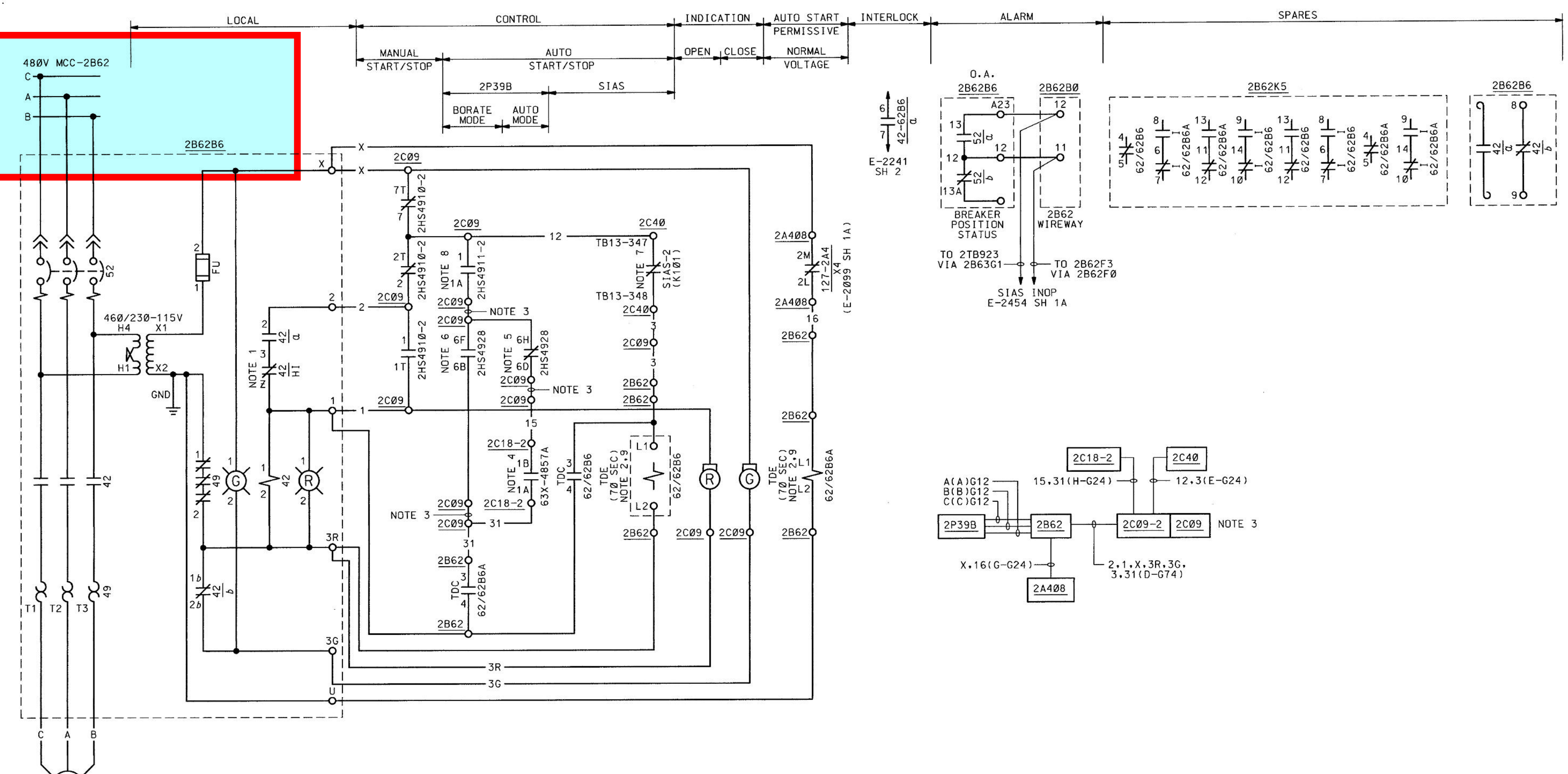
The SM/CRS has directed you to identify the components that need to be danger tagged to electrically and mechanically isolate Boric Acid Makeup Pump 2P-39B to isolate the pump seal leak. Also provide the component danger tag position required.

Component #	Component Name	Component Position

ATTACHMENT 2B62

GREEN TRAIN 480V ESF MCC 2B62

BREAKER NUMBER	DESCRIPTION	PRINT #	REQUIRED POSITION	TAG	INITIAL	COMMENTS
2B62-A1	Spare		Open			
2B62-A2	Spare		Open			
2B62-A3	Spare		Open			
2B62-A5	Charging Pump 2P-36B	E2248 SH 2	Closed			
	"LOCAL-REMOTE" handswitch (2HS-4843-2)		Remote			
	"STOP-START" handswitch (2HS-4844-2)		Stop			
2B62-B1	Post Accident H2 Panel 2C128B	E2431 SH 5	Closed			
2B62-B2	2DG2 Auxiliaries 2C174	E2431 SH 6	Closed			
2B62-B3	CNTMT HPA Sampling Monitor 2RE-8271-2	E2433 SH 4	Closed			
2B62-B4	2VEF-38B Disch Rad Monitor 2RE-8846-2	E2433 SH 4	Closed			
2B62-B5	2DG2 Rm Exh Fan Damper 2TCDM-8690-2 & 2TCDM 8692-2	E2356 SH 2	Closed			
2B62-B6	BAM Pump 2P-39B	E2241 SH 1A	Closed			
2B62-B7	Spare		Open			
2B62-B8	Spare		Open			
2B62-C1	Spare		Open			
2B62-C2	Series bkr for 2B62-E5, 2CV-5086-2	E2209 SH 1	Closed			
2B62-C3	Spare		Open			
2B62-C4	B SDC Hx Room 2VUC-1D	E2397 SH 1B	Closed			
2B62 C5	B SDC Hx Room 2VUC-1E	E2397 SH 1C	Closed			
2B62-C6	EDG #2 Room Exhaust Fan 2VEF-24C	E2356 SH 1B	Closed			
	"LOCAL-REMOTE" handswitch (2HS-8638-2S)		Remote			
	"ON-OFF" handswitch (2HS-8638-2A)		Off			



BORIC ACID MAKE-UP PUMP 2P39B - GREEN

SCHEME 2B62B6

ST #64D

NORM / STOP START / PULL TO LOCK / HANDLE END	CONTACT	START	NORM AFTR START	NORM AFTR STOP	STOP	TO LOCK	LOCATION 2C09 / FUNCTION OR REFERENCE DRAWING
1 – 2	1	X					THIS SH
	2	X	X	X			THIS SH
3 – 4	3		X	X			SPARE
	4		X	X			SPARE
5 – 6	5	X	X				SPARE
	6	X	X				SPARE
7 – 8	7	X	X	X	X		THIS SH
	8					X	E-2241 SH 1

REF DWGS:

1. E-2643 SH 1C,3C,4 (2B62) CONNECTION DIAGRAM
2. E-2614 SH 8B,8C (2A408) CONNECTION DIAGRAM
3. E-2683 SH 2 (2C09) CONNECTION DIAGRAM
4. E-2969 SH 10,11 (2C18-2) CONNECTION DIAGRAM
5. E-2700 SH 1 (2C40) CONNECTION DIAGRAM
6. M-2231 SH 2 P&ID
7. M-2417 SH 5,6 CONTROL LOGIC DIAGRAM
8. V/P 6600-M2001-B6-30 (414-304)
9. V/P 6600-M2201-325 SH 2,6,8 (2C09) WIRING DIAGRAM

NOTES:

1. HOLDING INTERLOCK CONTACT (42/HI) IS INSTALLED FOR MECHANICAL PUSHBUTTON.
2. TIMER SETTING IS NOMINAL. SIMS CONTROLS EXACT SETTING.
3. THESE WIRES INSTALLED IN SEPARATE WIREWAYS/SLEEVES FROM THE GREEN SECTION IN 2C09-2 DIRECTLY TO 2HS4928-2 TERMINALS 6B,6D,6H IN PANEL 2C09.
4. CONTACT CLOSES ON LOW VOLUME LEVEL IN TANK 2T4. SEE E-2715 SH 2.
5. CONTACT CLOSES IN AUTO MODE ONLY. SHOWN IN AUTO MODE. SEE E-2186 SH 1.
6. CONTACT CLOSES IN BORATE MODE ONLY. SEE E-2186 SH 1.
7. SIAS CONTACTS ARE SHOWN IN THE ACCIDENT CONDITION.
8. SELECTOR SWITCH 2HS4911-2 CONTACT DEVELOPMENT TABLE SHOWN ON THIS DRAWING SH 1.
9. RELAYS 62/62B6 AND 62/62B6A ARE PHYSICALLY LOCATED IN CUBICLE 2B62K5.

NAME: 62/62B6
TYPE: TIMER, ATC TYPE 365 (6)

CONTACT	REF DWG
3-4-5	THIS SHEET
7-6-8	SPARE INSTANTANEOUS
9-14-10	SPARE INSTANTANEOUS
12-11-13	SPARE
L1 L2 / 1 2	THIS SH NOTE: 15 JUMPERED TO 1
15-CLOCK	15 JUMPERED TO 1

NAME: 62/62B6A
TYPE: TIMER, ATC TYPE 365 (6)

CONTACT	REF DWG
3-4-5	THIS SHEET
7-6-8	SPARE INSTANTANEOUS
9-14-10	SPARE INSTANTANEOUS
12-11-13	SPARE
L1 L2 / 1 2	THIS SH NOTE: 15 JUMPERED TO 1
15-CLOCK	15 JUMPERED TO 1

REV	DATE	REVISION DESCRIPTION	BY	DFTG CHKR	ENGR	ENGR CHKR	APVD	APVD
6	FEB 06 2014	AS-BUILT: EC 47703	KDR	AKH				BB
5	SEP 09 2002	AS-BUILT: DRN 01-00902		APPROVED REVISION				
4	JUL 18 1996	AS-BUILT: DRN 95-02634 (PC 95-8029)		APPROVED REVISION				

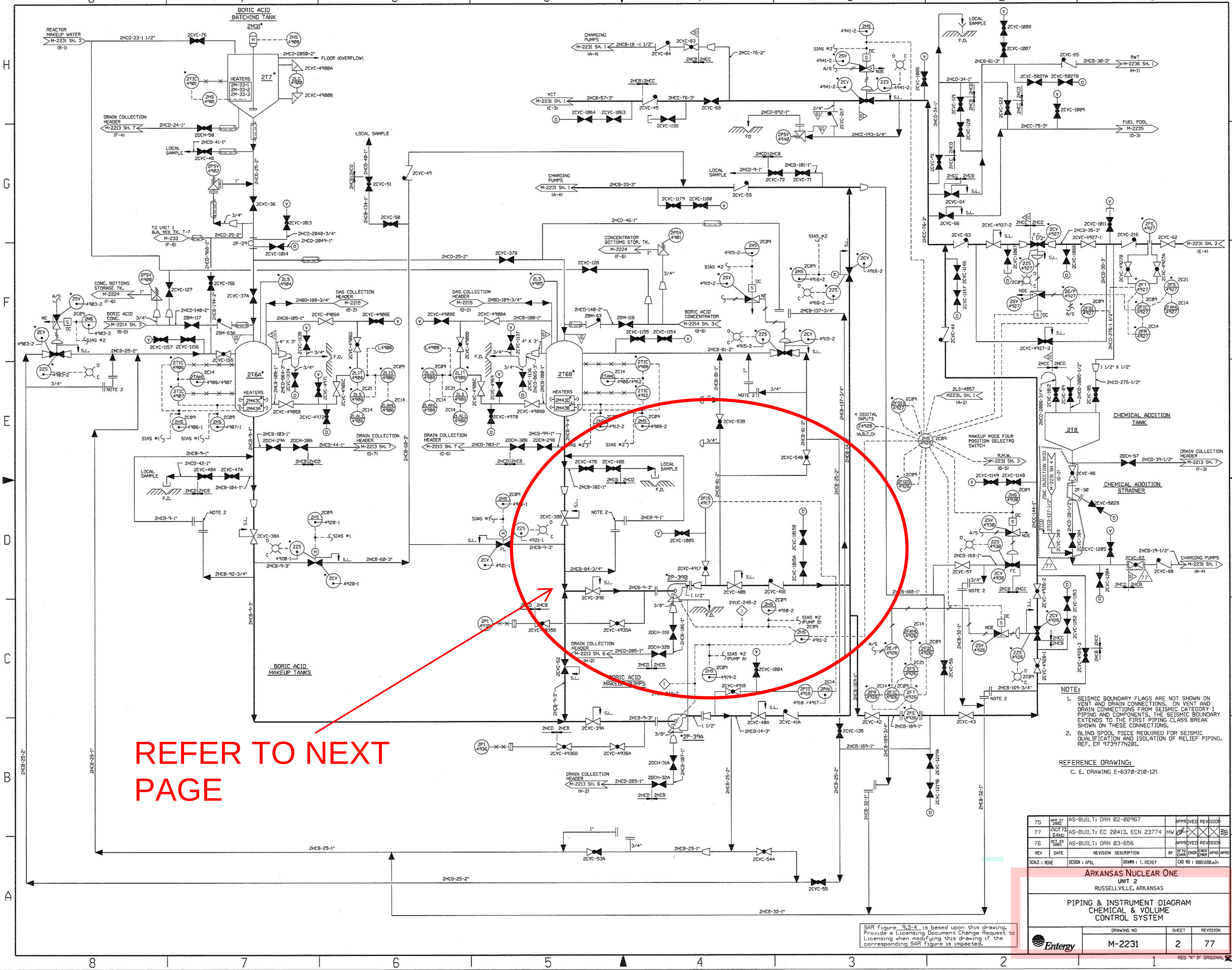
SCALE : NONE | DESIGN : BECHTEL CORP. | DRAWN : B.L. JACKSON | CAD NO : .

ARKANSAS NUCLEAR ONE
UNIT 2
RUSSELLVILLE, ARKANSAS

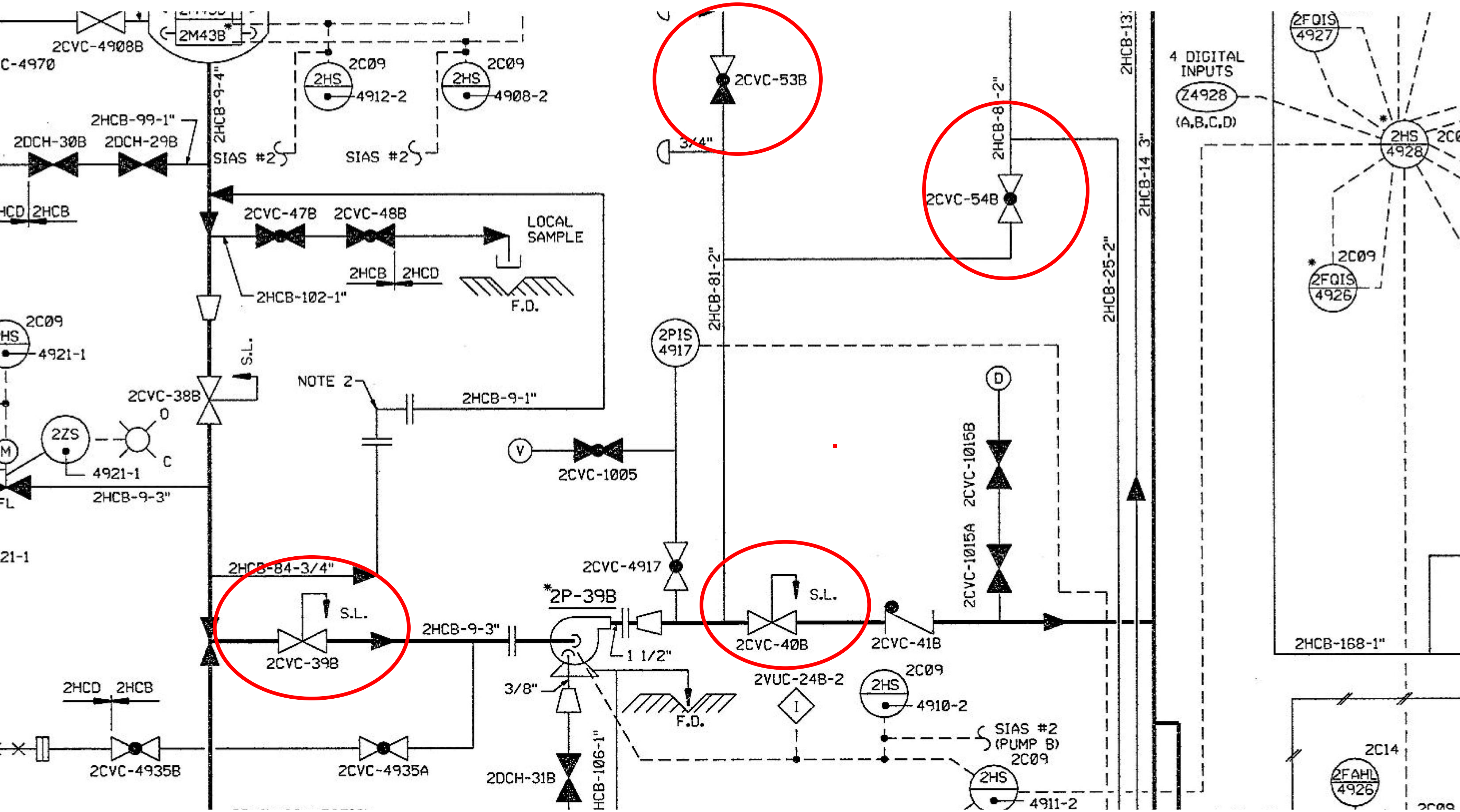
SCHEMATIC DIAGRAM
BORIC ACID MAKE-UP PUMP
2P39B

Entergy

DRAWING NO	SHEET	REVISION
E-2241	1A	6



REFER TO NEXT PAGE
NOTE:
1. SEISMIC BOUNDARY FLAGS ARE NOT SHOWN ON VENT AND DRAIN CONNECTIONS. ON VENT AND DRAIN CONNECTIONS FROM SEISMIC CATEGORY I PIPING AND COMPONENTS, THE SEISMIC BOUNDARY EXTENDS TO THE FIRST PIPING CLASS BREAK SHOWN ON THESE CONNECTIONS.
2. BLIND SPOOL PIECE REQUIRED FOR SEISMIC QUALIFICATION AND ISOLATION OF RELIEF PIPING. REF. ER 973977N201.
REFERENCE DRAWING:
C. E. DRAWING E-6370-210-121
SAR figure 9.3-4 is based upon this drawing. Provide a Licensing Document Change Request to Licensing when modifying this drawing if the corresponding SAR figure is impacted.
ARKANSAS NUCLEAR ONE
UNIT 2
RUSSELLVILLE, ARKANSAS
PIPING & INSTRUMENT DIAGRAM
CHEMICAL & VOLUME
CONTROL SYSTEM
DRAWING NO M-2231
SHEET 2
REVISION 77


2CVC-4908B
2M43B*
C-4970
2C09
2HS
4912-2
2C09
2HS
4908-2
2HCB-99-1"
2HCB-9-4"
2DCH-30B
2DCH-29B
SIAS #2
SIAS #2
2CVC-53B
3/4"
2HCB-8-2"
2CVC-54B
2HCB-81-2"
2HCB-13
2HCB-14 3"
2HCB-25-2"
4 DIGITAL INPUTS
Z4928
(A,B,C,D)
2FQIS
4927
2HS
4928
2FQIS
4926
2C09
2CVC-47B
2CVC-48B
LOCAL SAMPLE
2HCD
2HCB
2HCB
2HCD
2HCB-102-1"
F.D.
2C09
HS
4921-1
S.L.
2CVC-38B
O
C
NOTE 2
2HCB-9-1"
2ZS
4921-1
M
FL
2HCB-9-3"
2PIS
4917
V
2CVC-1005
D
2CVC-1015B
2CVC-1015A
21-1
2HCB-84-3/4"
S.L.
2CVC-39B
2HCB-9-3"
*2P-39B
2CVC-4917
S.L.
2CVC-40B
2CVC-41B
1 1/2"
3/8"
2HCB-168-1"
2VUC-24B-2
2C09
2HS
4910-2
F.D.
SIAS #2
(PUMP B)
2C09
2HS
4911-2
2HCD
2HCB
2CVC-4935B
2CVC-4935A
2DCH-31B
HCB-106-1"
2C14
2FAHL
4926
2C09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ____________

SYSTEM/DUTY AREA: Radiation Control

TASK: Determine Condenser off gas radiation monitor setting.

JTA#: ANO2-RO-RMS-OFFNORM-13

ALTERNATE PATH Yes: ____ No: X TIME CRITICAL Yes: ____ No: X

KA VALUE RO: 2.9 SRO: 3.1 KA REFERENCE: 2.3.15

APPROVED FOR ADMINISTRATION TO: RO: X SRO: ____

TASK LOCATION: INSIDE CR: ____ OUTSIDE CR: ____ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ SIMULATOR: ____ CLASSROOM: Perform

POSITION EVALUATED: RO: ____ SRO: ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ CLASSROOM: ____

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): 2105.016, Radiation Monitoring and Evacuation system. Unit 2 OPS B2 CBO Log.

EXAMINEE'S NAME: ____________ Badge #: ____________

EVALUATOR'S NAME: ____________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ UNSATISFACTORY: ____

PERFORMANCE CHECKLIST COMMENTS:

Start Time ____ Stop Time ____ Total Time ____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

TASK STANDARD:

Determined the new potentiometer setting for the alarm setpoint of 2RITS-0645 (potentiometer setting: 3.45) and the new voltage setting for 2RR-1057 (1.778 to 1.835) Secondary Radiation Recorder.

TASK PERFORMANCE AIDS:

2105.016, Radiation Monitoring and Evacuation System Rev. 31, and Unit 2 OPS-B2 CBO Log Rev. 9/1/2016

EXAMINER NOTES:

Determine Condenser off gas radiation monitor setting. This admin JPM has the applicant determine the new setpoint on the Condenser Off Gas Radiation Monitor 2RITS-0645 based on rising activity due the primary to Secondary leakage. The new setpoint must be calculated based on the guidance in the procedure and then a new potentiometer setting and voltage must be obtained from the tables in the procedure to allow the physical adjustment of the monitor controls.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Determine the highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW OP-2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

START TIME: _______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1. (Step 11.1)	Determine new high alarm setpoint for 2RITS-0645 from Unit 2 CBOT Electrical log (OPS-B2). • Verify setpoint within the following limits: - Minimum high alarm setpoint of 250 cpm - Smaller of 2 times background or 300 cpm above background	Examinee reviewed the Unit 2 OPS-B2 CBO Log and 2105.016 and determined that the new alarm set point should be 675 CPM. Background = 375 CPM. 2 X 375 = 750 CPM 375 +300 = 675 CPM 675 is less than 750. Thus new setpoint should be 675 CPM maximum	N/A SAT UNSAT
	2. (Step 11.2)	Obtain SM permission to adjust alarm setpoints for 2RITS-0645. **EXAMINER CUE:** **IF asked state SM permission is given.**	Examinee determined SM permission was given from the initial conditions.	N/A SAT UNSAT
(C)	3. (Step 11.3 and 11.3.1)	Perform the following to change 2RITS-0645 high alarm setpoint on 2C25: Determine potentiometer dial setting which corresponds to desired high alarm setpoint from Table 1 below.	Examinee determined the new potentiometer dial setting for 2RITS-0645 is 3.45 from Table 1. **Examiner Note: 675 cpm is between the values listed in table 1 and the applicant should select the value for 600 cpm to comply with step 11.1**	N/A SAT UNSAT
	4. (Step 11.3.2)	Adjust 2RITS-0645 high alarm setpoint potentiometer to required setting. **EXAMINER CUE:** **Report that the Potentiometer has been adjusted to the desired setting.**	Examinee told examiner they were ready to adjust the potentiometer per the initiating cue.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	5. (Step 11.4 and 11.4.1)	Perform the following to change 2RITS-0645 high alarm on Secondary Radiation Recorder (2RR-1057) on 2C14 and SEC SYS RADIATION HI (2K11-A10): Determine voltage setting which corresponds to desired high alarm setpoint from Table 2.	Examinee determined the new voltage setting for 2RR-1057 is 1.778 from Table 2. **Examiner Note: The value for 675 cpm is not in Table 2 and the applicant should select the value for 600 cpm to comply with step 11.1** **Examiner note: Either step 5 or step 6 is critical based on the which method the examinee chooses to determine the new voltage setting but the voltage setting must in the following band. 1.778.**	N/A SAT UNSAT
(C)	6. (Step 11.4.2)	<u>IF</u> desired setpoint NOT in Table 2, <u>THEN</u> perform the following to calculate corresponding voltage: $y = \frac{[\ln(x) - \ln(10)]}{\ln(10)}$ x = desired counts y = required voltage setting	Examinee determined the new voltage setting to be between 1.813 and 1.835 for 675 cpm. **Examiner Note: Either step 5 or step 6 is critical based on the which method the examinee chooses to determine the new voltage setting but the voltage setting must in the following band. 1.813 to 1.835**	N/A SAT UNSAT
END				

STOP TIME: ____________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

INITIATING CUE:

Determine the highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW OP-2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

Key:

2RITS-0645 potentiometer setting: ______3.45______________________________

2RR-1057 voltage setting: _____(1.778) or (1.813 to 1.835)__________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

`INITIAL CONDITIONS:

- Unit 2 is in Mode 1.
- 2K11-A10 Secondary System radiation hi alarm is locked in due to 2RITS-0645 Condenser off gas radiation monitor.
- Crew has entered Primary to Secondary leakage AOP due to a small primary to secondary leak that does not require a shutdown.
- The 2RITS-0645 was logged reading 375 CPM on the OPS-B2 CBO log.
- SM has given permission to adjust the alarm setpoint for 2RITS-0645.

INITIATING CUE:

Determine the highest allowable new potentiometer setting of 2RITS-0645, Condenser Off Gas Radiation Monitor, and highest allowable new voltage setting for 2RR-1057, Secondary Radiation Recorder, IAW OP-2105.016, Radiation Monitoring and Evacuation System, and OPS-B2 CBO log. Inform examiner when ready to adjust 2RITS-0645 alarm setpoint IAW step 11.3.2.

2RITS-0645 potentiometer setting: ______________________________

2RR-1057 voltage setting: ______________________________

2RITS-8233 READING	REQUIRED	Seq: 51	**Every Day**	137

Equip. ID: 2-RMS -SWITCH-2RITS-8233	Location: CR2-386-2C25

Short Instr: MAX=2X BACKGROUND TS 3.3.3.1 ODCM L2.2.1.

Units: CPM

Shift Time	Reading	Notes	Recorded By
Days	**105**		**Joe Reactor**
Nights			
Extra Set 1			
Extra Set 2			

SETPOINT FOR 2RITS-0645	REQUIRED	Seq: 52	**Every Day**	136

Location: CR2-386-2C25

Short Instr: SEE LONG INSTRUCTION FOR MAX CRITERIA

Long Instr: IF COND VAC PUMP IS IN OPERATION, THEN THE HIGH ALARM SETPT SHALL BE THE SMALLER OF 2X BACKGROUND OR APP 300 CPM ABOVE BKGRD. MINIMUM SETPOINT IS 250 CPM.

Units: CPM	Minimum: >= 250

Shift Time	Reading	Notes	Recorded By
Days	**250**		**Joe Reactor**
Nights			
Extra Set 1			
Extra Set 2			

2RITS-0645 READING COND VAC	REQUIRED	Seq: 53	**Every Day**	135

Equip. ID: 2-RMS -SWITCH-2RITS-0645	Location: CR2-386-2C25

Short Instr: 2RITS-0645

Units: CPM	Maximum: <= <EXPR>

Shift Time	Reading	Notes	Recorded By
Days	**375**		**Joe Reactor**
Nights			
Extra Set 1			
Extra Set 2			

Order	Description	Expression	Text	Color
1	EXCEEDS HIGH ALARM SETPOINT	n(sta(135))>N(STA(136))	EXCEEDS HIGH ALARM SETPOINT	

Max. Expr.: N(STA(136))

WASTE GAS DISCHARGE	REQUIRED	Seq: 54	**Every Day**	134

Equip. ID: 2-RMS -SWITCH-2RITS-2429	Location: CR2-386-2C25

Short Instr: ODCM L2.2.1 and L2.4.1 SEE LONG INST.

Long Instr: ODCM L2.2.1. IF 2RITS-2429 >= 8.9 E+5, THEN declare monitor inoperable and refer to ODCM L2.2.1 and L2.4.1 (ANO-91-05604)

If background reading drops significantly from previous readings, initiate actions to refill loop seals at 2FIT-2430 and 2RITS-2429. (CR-2-97-0037-03)

Units: CPM	Maximum: <= 890000

Shift Time	Reading	Notes	Recorded By
Days	**210**		**Joe Reactor**
Nights			
Extra Set 1			
Extra Set 2			

Order	Description	Expression	Text	Color
1	OOS HIGH	N(STA(134))>890000	ODCM L 2.2.1. IF 2RITS-2429 >= 8.9 E+5, THEN declare monitor inoperable and refer to ODCM L 2.2.1 and L 2.4.1 (ANO-91-05604)	

11.0 HIGH ALARM SETPOINT ADJUSTMENT FOR MAIN CONDENSER OFFGAS MONITOR (2RITS-0645).

11.1 Determine new high alarm setpoint for 2RITS-0645 from Unit 2 CBOT Electrical log (OPS-B2).

- Verify setpoint within the following limits:
  - Minimum high alarm setpoint of 250 cpm
  - Smaller of 2 times background or 300 cpm above background

11.2 Obtain SM permission to adjust alarm setpoints for 2RITS-0645.

11.3 Perform the following to change 2RITS-0645 high alarm setpoint on 2C25:

11.3.1 Determine potentiometer dial setting which corresponds to desired high alarm setpoint from Table 1 below.

11.3.2 Adjust 2RITS-0645 high alarm setpoint potentiometer to required setting.

TABLE 1

Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting	Alarm Setpoint CPM	Dial Setting
250	= 2.77	800	= 3.78	5000	= 5.24	10000	= 5.82
300	= 2.85	900	= 3.87	6000	= 5.42	20000	= 6.35
400	= 3.10	1000	= 4.00	7000	= 5.56	30000	= 6.66
500	= 3.30	2000	= 4.51	8000	= 5.68	40000	= 6.94
600	= 3.45	3000	= 4.82	9000	= 5.74	50000	= 7.09
700	= 3.62	4000	= 5.06				

11.4 Perform the following to change 2RITS-0645 high alarm on Secondary Radiation Recorder (2RR-1057) on 2C14 and SEC SYS RADIATION HI (2K11-A10):

11.4.1 Determine voltage setting which corresponds to desired high alarm setpoint from Table 2 below.

TABLE 2

Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting	Alarm Setpoint CPM	Voltage Setting
250	= 1.398	425	= 1.628	1000	= 2.000	8000	= 2.903
275	= 1.439	450	= 1.653	2000	= 2.301	9000	= 2.954
300	= 1.477	500	= 1.699	3000	= 2.477	10000	= 3.000
325	= 1.512	600	= 1.778	4000	= 2.602	20000	= 3.301
350	= 1.544	700	= 1.845	5000	= 2.699	30000	= 3.477
375	= 1.574	800	= 1.903	6000	= 2.778	40000	= 3.602
400	= 1.602	900	= 1.954	7000	= 2.845	50000	= 3.699

11.4.2 IF desired setpoint NOT in Table 2,
THEN perform the following to calculate corresponding voltage:

$$y = \frac{[\ln(x) - \ln(10)]}{\ln(10)}$$

x = desired counts

y = required voltage setting

11.4.3 At 2RR-1057 on Panel 2C14, open recorder front cover.

11.4.4 Press MENU key and hold for three seconds to enter SET mode.

11.4.5 Select ALARM display by using UP/DOWN keys (Display shows “SET = ALARM”) and press ENTER key.

11.4.6 Select Channel 3 for 2RITS-0645 using UP/DOWN keys (Display shows "3:Level=") and press ENTER key.

11.4.7 Select Level of the alarm using UP/DOWN keys (Display shows “3:LEVEL = 1”) and press ENTER key.

11.4.8 Select status of alarm to ON by using UP/DOWN keys (Display shows “3/1:ALM = ON”) and press ENTER key.

11.4.9 Select Type alarm by using UP/DOWN keys to select H for high alarm. (Display shows “3/1:Type = H”) and press ENTER key.

11.4.10 Enter desired alarm setpoint voltage value by using UP/DOWN and RIGHT keys. (Display shows “3/1:X.XXX”) and press ENTER key.

11.4.11 Display which appears should show output relay to be ON (Display shows “3/1:RLY = ON”) and press ENTER key.

11.4.12 Enter relay number I03 for 2RITS-0645 using UP/DOWN keys (Display shows “3/1:R.N = I03”) and press ENTER key.

11.4.13 Verify display shows “SET OK”.

11.4.14 <u>IF</u> alarm setpoint satisfactorily changed to desired setting,
<u>THEN</u> press MENU key AND hold for three seconds to return to Operation mode.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:**______________

SYSTEM/DUTY AREA: Conduct of Operations

TASK: Review dilution calculation

JTA#: ANO2-RO-CHADD-NORM-3

KA VALUE RO: 4.1 **SRO:** 4.3 **KA REFERENCE:** 2.1.43

APPROVED FOR ADMINISTRATION TO: RO: ________ **SRO:** X

TASK LOCATION: INSIDE CR: __________ **OUTSIDE CR:** __________ **BOTH:** X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ **SIMULATOR:** Perform **CLASSROOM:** Perform

POSITION EVALUATED: RO: ____________ **SRO:** ____________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ **PLANT SITE:** ______ **CLASSROOM:** _____

TESTING METHOD: SIMULATE: ____________ **PERFORM:** ____________

APPROXIMATE COMPLETION TIME IN MINUTES: 10 minutes

REFERENCE(S): OP 2103.004 Soluble Poison Concentration Control REV. 11

EXAMINEE'S NAME: ____________________________________ **LOGON ID:** ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______________ **UNSATISFACTORY:** ______________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ **Start Time** __________ **Stop Time** __________ **Total Time**

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

TASK STANDARD:

Determined the given calculation was incorrect and determined the actual amount of water needed to dilute from actual to ECB boron concentration has been calculated using OP 2103.004 Attachment ‘A.3’.

TASK PERFORMANCE AIDS:

OP 2103.004 Soluble Poison Concentration Control REV. 11
Attachment ‘A.3’and Attachment C.

EXAMAINER NOTES:

Review dilution calculation. This administrative JPM has the applicant has to review a completed calculation find the errors, and determine the amount of water needed to dilute the RCS from it actual boron concentration to the Estimated Critical Boron Concentration using a manual calculation sheet in the Chemical Addition Procedure.

JOB PERFORMANCE MEASURE

INITIATING CUE:

Review completed Dilution water calculation (OP 2103.004 Attachment A.3 and Attachment C), Correct any errors that may be found and determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration

Start Time: _________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1.	Review 2103.004 Attachment A.3 for completeness and errors.	Determined both of the following errors: Mass of Reactor Coolant (Mr) was determined incorrectly from Attachment C. And Initial and final Boron Concentrations were reversed is step 3.0 of the calculation.	N/A SAT UNSAT
	2.	Record the following data from initial conditions attachment.	Ensured the recorded data was acurate: - 545°F (Tave) - 42% (PZR Level) - 60% (VCT Level) - (Cri) = 750 PPM (initial) - (Crf) = 350 PPM (final)	N/A SAT UNSAT
(C)	3.	Correct RC Mass from Attachment C.	Determined the correct RC mass from Attachment C for a PZR level of 42%, 545°F, and 2200 psia. (Mr) = 481980 lb (C)	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

(C)	4.	Calculate the DI Water Feed Mass.	Calculated the DI Water Feed Mass: Mf = 481980 ln (750/350) Mf = 367336.3 lb (C) Acceptable range: (367300 – 367400 lb)	N/A SAT UNSAT
(C)	5.	Calculate DI water feed volume	Calculate DI water feed volume: F = (Mf) (Vf) (7.48 gal/ft^3) Vf = sv@80°F = 0.0161 ft^3/lb F = (367336.3lb) (0.0161)(7.48) F = 44237.6 gallons (C) Acceptable range: (44233-44245.3 gallons)	N/A SAT UNSAT
END				

Stop Time: ________________

SEE KEY ON NEXT 2 PAGES

KEY

ATTACHMENT A.3

PAGE 1 OF 1

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = 545 °F
- Pressurizer Level = 42 %
- VCT Level = 60 %
- Initial RCS Boron Conc.(Cr_i) = 750 ppm
- Final Desired RCS Boron Conc.(Cr_F) = 350 ppm

2.0 Determine the RC Mass from Attachment C:

1st error

Mass of Reactor Coolant (Mr) = 490160 lb. Should be 481980 lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

2nd error

M_f = (490160) ln (350 / 750) Should be ln (750/350)

M_f = 373570 lb. Should be 367336.3 lb

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F\ (7.48)$

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (M_F) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (373570 lb.) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = 44988.3 gal. DI water Should be 44237.6 gallons

Performed By: Jo RO Time: Now Date: Today

Supervisor Review: ______ Date: ______

Corrected form on the next page.

KEY

KEY

ATTACHMENT A.3

PAGE 1 OF 1

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = 545 ^{0}F
- Pressurizer Level = 42%
- VCT Level = 60%
- Initial RCS Boron Conc.(Cr_i) = 750 ppm
- Final Desired RCS Boron Conc.(Cr_F) = 350 ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = 481980 lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

$$M_f = (481980) \ln \left(\frac{750}{350}\right)$$

M_f = 367300 – 367400 lb.

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F$ (7.48)

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

F = (M_F) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = (367300 – 367400 lb.) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = 44233-44245.3 gal. DI water

Performed By: ______________________ Time: __________ Date: __________

Supervisor Review: ______________________________ Date: __________

KEY

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

Review completed Dilution water calculation (OP 2103.004 Attachment A.3 and Attachment C), Correct any errors that may be found and determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- OP 2102.016 Reactor Startup Step 7.19 requires that RCS boron concentration is adjusted to the ECB value.
- Mode 3
- PZR level = 42%
- RCS pressure = 2200 psia
- Tave = 545°F
- VCT level = 60%
- Present boron concentration = 750 ppm
- ECB is calculated to be 350 ppm

INITIATING CUE:

Review completed Dilution water calculation (OP 2103.004 Attachment A.3 and Attachment C), Correct any errors that may be found and determine the amount of dilution water required to bring RCS boron concentration to the given ECB concentration

ATTACHMENT A.3

WORK SHEET FOR MAKEUP IN DILUTE MODE

NOTE

- Changes made affecting the calculation should be coordinated with Computer Support prior to implementation.
- The BORON2 program located on the plant computer is the preferred method for performing the calculations in this procedure. Manual calculations include assumptions for simplicity that result in slightly different calculated volumes than those calculated using BORON2 (see Limit and Precaution 5.2)

1.0 Record the following:

- RCS Temp. = 545 °F
- Pressurizer Level = 42 %
- VCT Level = 60 %
- Initial RCS Boron Conc.(Cr_i) = 750 ppm
- Final Desired RCS Boron Conc.(Cr_F) = 350 ppm

2.0 Determine the RC Mass from Attachment C:

Mass of Reactor Coolant (Mr) = 490160 lb.

3.0 Calculate the DI Water Feed Mass (M_f):

$$M_f = M_r \ln \left[\frac{Cr_i}{Cr_F}\right]$$

M_f = (490160) ln (350 / 750)

M_f = 373570 lb.

4.0 Calculate the DI Water Feed Volume (F) that must be fed to change the boron concentration from Cr_i to Cr_F:

$F = M_F V_F\ (7.48)$

V_F = Specific Volume of Feed @80°F(ft^3/lb.)= 0.0161 ft^3/lb.

$F = (M_F)\ (0.0161\ ft^3/lb.)\ (7.48\ gal/ft^3)$

F = (373570 lb.) (0.0161 ft^3/lb.) (7.48 gal/ft^3)

F = 44988.3 gal. DI water

Performed By: Jo RO Time: Now Date: Today

Supervisor Review: ______ Date: ______

ATTACHMENT C

REACTOR COOLANT MASS TABLE

ANO - UNIT 2
MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	**100˚F**	**140˚F**	**200˚F**	**240˚F**	**300˚F**	**545˚F**
0	632,303	626,598	614,668	604,785	556,500	462,894
2	633,589	627,885	615,957	606,075	557,617	463,803
4	634,874	629,172	617,246	607,365	558,733	464,711
6	636,160	630,459	618,535	608,656	559,850	465,620
8	637,446	631,746	619,824	609,946	560,966	466,529
10	638,731	633,033	621,113	611,237	562,083	467,438
12	640,017	634,320	622,402	612,527	563,199	468,347
14	641,303	635,607	623,691	613,817	564,315	469,256
16	642,588	636,894	624,980	615,108	565,432	470,165
18	643,874	638,181	626,269	616,398	566,548	471,074
20	645,160	639,468	627,558	617,689	567,665	471,982
22	646,445	640,755	628,847	618,979	568,781	472,891
24	647,731	642,042	630,137	620,270	569,898	473,800
26	649,017	643,329	631,426	621,560	571,014	474,709
28	650,302	644,616	632,715	622,850	572,131	475,618
30	651,588	645,903	634,004	624,141	573,247	476,527
32	652,874	647,190	635,293	625,431	574,364	477,436
34	654,159	648,477	636,582	626,722	575,480	478,345
36	655,445	649,764	637,871	628,012	576,596	479,253
38	656,731	651,051	639,160	629,302	577,713	480,162
40	658,016	652,338	640,449	630,593	578,829	481,071
42	659,302	653,626	641,738	631,883	579,946	481,980
44	660,588	654,913	643,027	633,174	581,062	482,889
46	661,873	656,200	644,316	634,464	582,179	483,798
48	663,159	657,487	645,605	635,754	583,295	484,707

ATTACHMENT C

PAGE 2 OF 2

ANO - UNIT 2

MR (MASS OF REACTOR COOLANT AT GIVEN TEMP., LBS.)

PZR PRESSURE	250 psia	250 psia	250 psia	250 psia	1000 psia	2200 psia
PZR LEVEL (%)	**100˚F**	**140˚F**	**200˚F**	**240˚F**	**300˚F**	**545˚F**
50	664,445	658,774	646,894	637,045	584,412	485,616
52	665,730	660,061	648,183	638,335	585,528	486,524
54	667,016	661,348	649,472	639,626	586,644	487,433
56	668,302	662,635	650,761	640,916	587,761	488,342
58	669,587	663,922	652,050	642,206	588,877	489,251
60	670,873	665,209	653,339	643,497	589,994	490,160
62	672,159	666,496	654,629	644,787	591,110	491,069
64	673,444	667,783	655,918	646,078	592,227	491,978
66	674,730	669,070	657,207	647,368	593,343	492,887
68	676,016	670,357	658,496	648,658	594,460	493,796
70	677,301	671,644	659,785	649,949	595,576	494,704
72	678,587	672,931	661,074	651,239	596,692	495,613
74	679,873	674,218	662,363	652,530	597,809	496,522
76	681,158	675,505	663,652	653,820	598,925	497,431
78	682,444	676,792	664,941	655,111	600,042	498,340
80	683,730	678,079	666,230	656,401	601,158	499,249
82	685,015	679,366	667,519	657,691	602,275	500,158
84	686,301	680,653	668,808	658,982	603,391	501,067
86	687,587	681,940	670,097	660,272	604,508	501,975
88	688,872	683,227	671,386	661,563	605,624	502,884
90	690,158	684,514	672,675	662,853	606,741	503,793
92	691,444	685,801	673,964	664,143	607,857	504,702
94	692,729	687,088	675,253	665,434	608,973	505,611
96	694,015	688,375	676,542	666,724	610,090	506,520
98	695,301	689,662	677,831	668,015	611,206	507,429
100	696,586	690,949	679,120	669,305	612,323	508,338

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:**______________

SYSTEM/DUTY AREA: **CONDUCT OF OPERATIONS**

TASK: **Perform Azimuthal Power Tilt calculation using the CPC System**

JTA#: **ANO2-RO-CPC-NORM-4**

KA VALUE RO: **4.6** **SRO:** **4.6** **KA REFERENCE:** **2.1.20**

APPROVED FOR ADMINISTRATION TO: RO: ________ **SRO:** **X**

TASK LOCATION: INSIDE CR: __________ **OUTSIDE CR:** __________ **BOTH:** **X**

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______________ **SIMULATOR:**_______ **CLASSROOM:** **Perform**

POSITION EVALUATED: RO: ___________ **SRO:** ___________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _______ **PLANT SITE:** ______ **CLASSROOM:** _____

TESTING METHOD: SIMULATE: ___________ **PERFORM:** ___________

APPROXIMATE COMPLETION TIME IN MINUTES: **15 minutes**

REFERENCE(S): **OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05**

EXAMINEE'S NAME: ___________________________________ **LOGON ID:** ________________

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: _____________ **UNSATISFACTORY:** _____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

__________ **Start Time** __________ **Stop Time** __________ **Total Time**

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (T_{COLSS}) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
    - Channel A 99.89%
    - Channel B 99.85%
    - Channel C 100.10%
    - Channel D 100.12%

TASK STANDARD:

Applicant determines that the Azimuthal Power Tilt T_q is between = 0.006 to 0.0072, that Calculated Azimuthal Power Tilt Tq is in compliance with Tech Spec 3.2.3 COLR, and that Calculated CPC Azimuthal Tilt Allowance is less than the Azimuthal Tilt Allowance installed in the CPC.

TASK PERFORMANCE AIDS:

OP 2103.017 Azimuthal Power Tilt Calculation using the CPC System Rev. 05 Supplement 1

EXAMINER NOTES:

Perform an Azimuthal Power Tilt calculation using CPC System. This admin JPM has the applicant perform a required 12 hour surveillance to calculate the Azimuthal Power Tilt using CPC values for core flux since the normal calculating computer program COLSS is out of service. Once the Azimuthal Power Tilt value and the allowed value has been calculated, the applicant must verify that the Azimuthal Power Tilt value does not exceed the TS 3.2.3 TS and COLR value of ≤ 0.03 and the calculated CPC Azimuthal Tilt Allowance is less than the value that had been calculated by COLSS and inserted into CPC PID 63 prior to COLSS going out of service (1.015).

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 and determine if the Azimuthal tilt value is within the acceptable TS and COLR limits.

Start Time: _________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 2.1)	Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.	In step 2.5 and Section 3.0, recorded the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from the initial JPM conditions T_{COLSS} = 0.0052	N/A SAT UNSAT
	2. (Step 2.2)	Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Neutron Flux Power CPC PID 171 obtained from the initial JPM conditions for all operable CPCs. • Channel A 99.89% = D_1 • Channel B 99.85% = D_2 • Channel C 100.10% = D_3 • Channel D 100.12% = D_4	N/A SAT UNSAT
	3. (Step 2.3)	Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.	In Table 1 of Section 3.0, recorded the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from initial JPM conditions for all operable CPCs. CPC PID 063 = 1.015 for all 4 CPC Channels	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 2.4) (Step 2.4.1)	Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used. CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.	Used the correct formula and calculated Azimuthal Power Tilt (T_{CPC}) for all CPCs operable. $T_{CPC} \quad \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$ $\sqrt{\left[\frac{99.85 - 100.10}{99.85 + 100.10}\right]^2 + \left[\frac{100.12 - 99.89}{100.12 + 99.89}\right]^2}$ $\sqrt{\left[\frac{-0.25}{199.95}\right]^2 + \left[\frac{0.23}{200.01}\right]^2} \quad \underline{0.0017}$ Recorded $T_{CPC} =$ <u>0.0017</u> in table 1 of Section 3.0 Acceptable range = 0.001 to 0.002.	N/A SAT UNSAT
<u>EXAMINER'S NOTE:</u> Steps 2.4.2 through 2.4.5 will be NA due to all CPC channels operable.				
(C)	5. (Step 2.5)	Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0. $T_q = T_{CPC} + T_{COLSS}$	Calculated Azimuthal Power Tilt T_q using $T_q = T_{CPC} + T_{COLSS}$ 0.0017 + 0.0052 = <u>0.0069</u> Recorded T_q value of <u>0.0069</u> in Table 1 of Section 3.0 Acceptable range = 0.006 to 0.0072.	N/A SAT UNSAT
(C)	6. (Step 2.6)	Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance. Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$	Calculated CPC Azimuthal Tilt Allowance = $T_q + 1$ 0.0069 + 1 = <u>1.0069</u> Recorded $T_q + 1$ value of <u>1.0069</u> in Table 1 of Section 3.0 Acceptable range = 1.006 to 1.0072.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	7. (Step 3.2)	Is Calculated Azimuthal Power Tilt Tq in compliance with the TS 3.2.3 limit? (circle one) YES NO	Determined that the calculated Azimuthal Power Tilt Tq is in compliance with the TS 3.2.3 limit? Tilt Tq (0.0069) is less than the COLR Azimuthal Power Tilt – Tq limit of ≤ 0.03 Circled YES	N/A SAT UNSAT
(C)	8. (Step 3.3)	Is Calculated CPC Azimuthal Tilt Allowance less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC? (circle one) YES NO	Determined that the calculated CPC Azimuthal Tilt Allowance is less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC? Tilt Allowance = T_q + 1 (1.006 to 1.0072) is less than 1.015 Circled YES	N/A SAT UNSAT
END				

Stop Time: ________________

SEE KEY

KEY

SUPPLEMENT 1

AZIMUTHAL POWER TILT CALCULATION USING THE CPC SYSTEM

This attachment is used to document the manual calculation of Azimuthal Tilt required by Technical Specification Surveillance Requirement listed below:

4.2.3 The AZIMUTHAL POWER TILT shall be determined to be within the limit above 20 % of RATED THERMAL POWER by:

b. Calculating the tilt at least once per 12 hours when the COLSS is inoperable.

WHEN COLSS is inoperable, THEN perform this calculation once each shift. A minimum of 3 operable CPCs are required for this calculation.

~~1.0~~ INITIAL CONDITIONS

~~1.1~~ COLSS is inoperable and RATED THERMAL POWER is greater than 20%.

~~1.2~~ At least 3 CPCs are operable.

~~2.0~~ INSTRUCTIONS

~~2.1~~ Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.

~~2.2~~ Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.

~~2.3~~ Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.

KEY

SUPPLEMENT 1

~~2.4~~ Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used.

~~2.4.1~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{99.85 - 100.10}{99.85 + 100.10}\right]^2 + \left[\frac{100.12 - 99.89}{100.12 + 99.89}\right]^2}$$

$$\sqrt{\left[\frac{-0.25}{199.95}\right]^2 + \left[\frac{0.23}{200.01}\right]^2} \quad \underline{0.0017}$$

Acceptable Range 0.001 to 0.002

NA ~~2.4.2~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with D CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{D_3 + D_2 - 2D_1}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \underline{\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA ~~2.4.3~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with B CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{2D_3 - D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\qquad - \qquad}{\qquad + \qquad}\right]^2 + \left[\frac{2(\qquad) - \qquad - \qquad}{\qquad + \qquad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{\qquad}\right]^2 + \left[\frac{\qquad}{\qquad}\right]^2} \quad \underline{\qquad\qquad}$$

NA ~~2.4.4~~ CPC Azimuthal Power Tilt (T_{CPC}) Calculation with A CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{2D_4 - D_3 - D_2}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\qquad - \qquad}{\qquad + \qquad}\right]^2 + \left[\frac{2(\qquad) - \qquad - \qquad}{\qquad + \qquad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{\qquad}\right]^2 + \left[\frac{\qquad}{\qquad}\right]^2} \quad \underline{\qquad\qquad}$$

KEY

KEY

SUPPLEMENT 1

NA 2.4.5 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with C CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{D_4 + D_1 - 2D_2}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\quad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\quad}{\quad}\right]^2 + \left[\frac{\quad}{\quad}\right]^2} \quad \_\_\_\_$$

2.5 Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0.

$$T_q \quad T_{CPC} + T_{COLSS}$$

0.0017 + 0.0052

= 0.0069

Acceptable Range
0.006 to 0.0072

2.6 Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance.

Calculated CPC Azimuthal Tilt Allowance = T_q + 1

= 1.0069

Acceptable Range
1.006 to 1.0072

KEY

KEY

SUPPLEMENT 1

3.0 ACCEPTANCE CRITERIA

3.1 Data

COLSS Tilt T_{COLSS} 0.0052

Table 1

	CPC A	CPC B	CPC C	CPC D
Neutron Flux Power (Pt. ID 171)	(D_1) 99.89	(D_2) 99.85	(D_3) 100.10	(D_4) 100.12
Azimuthal Tilt Allowance (Pt. ID 063)	1.015	1.015	1.015	1.015
Calculated Azimuthal Power Tilt (from step 2.5)	(T_q) 0.0069	N/A	N/A	N/A
Calculated CPC Azimuthal Tilt Allowance (from step 2.6)	(T_q + 1) 1.0069	N/A	N/A	N/A

3.2 Is Calculated Azimuthal Power Tilt T_q in compliance with the TS 3.2.3 limit?

(circle one) YES NO

3.3 Is Calculated CPC Azimuthal Tilt Allowance less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC?

(circle one) YES NO

NA 3.4 IF No is circled in either question above,

THEN perform following:

3.4.1 Immediately notify Shift Manager.

3.4.2 Refer to Tech Spec 3.2.3 for required actions.

3.4.3 Refer to 2105.001 for steps to change Pt. ID 063 in all operable CPCs as required.

3.4.4 Initiate Condition Report.

PERFORMED BY____ DATE____________

INDEPENDENT REVIEW BY ______________________________ DATE____________

KEY

EXAMINER'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (TCOLSS) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
  - Channel A 99.89%
  - Channel B 99.85%
  - Channel C 100.10%
  - Channel D 100.12%

INITIATING CUE:

The SM/CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 and determine if the Azimuthal tilt value is within the acceptable TS and COLR limits.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The Unit is at 100% Power
- Core Operating Limit Supervisory System (COLSS) is inoperable
- All four(4) CPC Channels are operable
- The last known good value of PMS Point CV9008 (TCOLSS) is 0.0052
- CPC PID 063 Azimuthal Tilt Allowance is reading 1.015 on all 4 CPC channels
- CPC PID 171 Neutron Flux Power is reading as follows:
    - Channel A 99.89%
    - Channel B 99.85%
    - Channel C 100.10%
    - Channel D 100.12%

INITIATING CUE:

The CRS directs, perform an Azimuthal Power Tilt Calculation using the CPC System using OP 2103.017 Supplement 1 starting at step 2.0 and determine if the Azimuthal tilt value is within the acceptable and COLR limits.

SUPPLEMENT 1

AZIMUTHAL POWER TILT CALCULATION USING THE CPC SYSTEM

This attachment is used to document the manual calculation of Azimuthal Tilt required by Technical Specification Surveillance Requirement listed below:

4.2.3 The AZIMUTHAL POWER TILT shall be determined to be within the limit above 20 % of RATED THERMAL POWER by:

b. Calculating the tilt at least once per 12 hours when the COLSS is inoperable.

<u>WHEN</u> COLSS is inoperable, <u>THEN</u> perform this calculation once each shift. A minimum of 3 operable CPCs are required for this calculation.

~~1.0~~ INITIAL CONDITIONS

~~1.1~~ COLSS is inoperable and RATED THERMAL POWER is greater than 20%.

~~1.2~~ At least 3 CPCs are operable.

2.0 INSTRUCTIONS

2.1 Record in Section 3.0 and step 2.5, the last valid COLSS calculated Azimuthal Tilt (T_{COLSS}), obtained from PMS/PDS point CV9008 or from Power Distribution logs.

2.2 Record in Table 1 of Section 3.0, the value of Neutron Flux Power, point I.D. 171, obtained from all operable CPCs.

2.3 Record in Table 1 of Section 3.0, the value of Azimuthal Tilt Allowance, point I.D. 063, obtained from all operable CPCs.

2.4 Calculate T_{CPC} and record in Table 1 Section 3.0, N/A formulas not used.

2.4.1 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with all CPCs operable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_2 - D_3}{D_2 + D_3}\right]^2 + \left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad - \quad}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{\qquad}\right]^2 + \left[\frac{\qquad}{\qquad}\right]^2} \quad \underline{\qquad\qquad}$$

2.4.2 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with D CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{D_3 + D_2 - 2D_1}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\quad - \quad}{\quad + \quad}\right]^2 + \left[\frac{\quad + \quad - 2(\qquad)}{\quad + \quad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{\qquad}\right]^2 + \left[\frac{\qquad}{\qquad}\right]^2} \quad \underline{\qquad\qquad}$$

2.4.3 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with B CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{2D_3 - D_4 - D_1}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\qquad - \qquad}{\qquad + \qquad}\right]^2 + \left[\frac{2(\qquad) - \qquad - \qquad}{\qquad + \qquad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{}\right]^2 + \left[\frac{\qquad}{}\right]^2} \qquad \underline{\qquad\quad}$$

2.4.4 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with A CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_3 - D_2}{D_3 + D_2}\right]^2 + \left[\frac{2D_4 - D_3 - D_2}{D_3 + D_2}\right]^2}$$

$$\sqrt{\left[\frac{\qquad - \qquad}{\qquad + \qquad}\right]^2 + \left[\frac{2(\qquad) - \qquad - \qquad}{\qquad + \qquad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{}\right]^2 + \left[\frac{\qquad}{}\right]^2} \qquad \underline{\qquad\quad}$$

SUPPLEMENT 1

2.4.5 CPC Azimuthal Power Tilt (T_{CPC}) Calculation with C CPC inoperable.

$$T_{CPC} \quad \sqrt{\left[\frac{D_4 - D_1}{D_4 + D_1}\right]^2 + \left[\frac{D_4 + D_1 - 2D_2}{D_4 + D_1}\right]^2}$$

$$\sqrt{\left[\frac{\qquad - \qquad}{\qquad + \qquad}\right]^2 + \left[\frac{\qquad + \qquad - 2(\qquad)}{\qquad + \qquad}\right]^2}$$

$$\sqrt{\left[\frac{\qquad}{\qquad}\right]^2 + \left[\frac{\qquad}{\qquad}\right]^2} \quad \underline{\qquad}$$

2.5 Determine Calculated Azimuthal Power Tilt T_q and record in Table 1 of Section 3.0.

$$T_q \quad T_{CPC} + T_{COLSS}$$

$$\underline{\qquad\quad} + \underline{\qquad\quad}$$

$$= \underline{\qquad\qquad}$$

2.6 Determine and record in Table 1 Section 3.0 the Calculated CPC Azimuthal Tilt Allowance.

Calculated CPC Azimuthal Tilt Allowance = T_q + 1

= ________

SUPPLEMENT 1

3.0 ACCEPTANCE CRITERIA

3.1 Data

COLSS Tilt T_{COLSS}____________

Table 1

	CPC A	CPC B	CPC C	CPC D
Neutron Flux Power (Pt. ID 171)	(D_1)	(D_2)	(D_3)	(D_4)
Azimuthal Tilt Allowance (Pt. ID 063)				
Calculated Azimuthal Power Tilt (from step 2.5)	(T_q)	N/A	N/A	N/A
Calculated CPC Azimuthal Tilt Allowance (from step 2.6)	(T_q + 1)	N/A	N/A	N/A

3.2 Is Calculated Azimuthal Power Tilt T_q in compliance with the TS 3.2.3 limit?

(circle one) YES NO

3.3 Is Calculated CPC Azimuthal Tilt Allowance less than the Azimuthal Tilt Allowance (Pt. ID 063) installed in each CPC?

(circle one) YES NO

3.4 IF No is circled in either question above,

THEN perform following:

3.4.1 Immediately notify Shift Manager.

3.4.2 Refer to Tech Spec 3.2.3 for required actions.

3.4.3 Refer to 2105.001 for steps to change Pt. ID 063 in all operable CPCs as required.

3.4.4 Initiate Condition Report.

PERFORMED BY_______________________________________ DATE____________

INDEPENDENT REVIEW BY _____________________________ DATE____________

SUPPLEMENT 1

4.0 SHIFT MANAGER REVIEW AND ANALYSIS

4.1 Have requirements of Acceptance Criteria been satisfied?

(circle one) YES NO

4.2 IF answer to Step 4.1 is NO, THEN describe actions taken.

____

____

____

____

____

____

4.3 Have all administrative requirements of this test been satisfied (i.e., all steps complete or N/A'd, all data entered, applicable signature spaces signed, etc.)?

(circle one) YES NO

SHIFT MANAGER______________________________ DATE____________

AXIMUTHAL POWER – T_q

LIMITING CONDITION FOR OPERATION

3.2.3 The AZIMUTHAL POWER TILT (T_q) shall be less than or equal to the AZIMUTHAL POWER TILT Allowance used in the Core Protection Calculators (CPCs).

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.*

ACTION:

a. With the measured AZIMUTHAL POWER TILT determined to exceed the AZIMUTHAL POWER TILT Allowance used in the CPCs but within the limit specified in the CORE OPERATING LIMITS REPORT, within two hours either correct the power tilt or adjust the AZIMUTHAL POWER TILT Allowance used in the CPCs to greater than or equal to the measured value.

b. With the measured AZIMUTHAL POWER TILT determined to exceed the limit specified in the CORE OPERATING LIMITS REPORT:

1. Due to misalignment of a CEA, within 30 minutes verify that the Core Operating Limit Supervisory System (COLSS) (when COLSS is being used to monitor the core power distribution per Specifications 4.2.1 and 4.2.4) is detecting the CEA misalignment.

2. Verify that the AZIMUTHAL POWER TILT is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Linear Power Level – High trip setpoints to $\leq$ 55% of RATED THERMAL POWER within the next 4 hours.

3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the AZIMUTHAL POWER TILT is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.

---

* See Special Test Exception 3.10.2.

V. CORE OPERATING LIMITS

The cycle-specific operating limits for the specifications listed are presented below.

1) 3/4.1.1.1 - SHUTDOWN MARGIN- $T_{avg} \geq 200$ °F

The SHUTDOWN MARGIN shall be greater than or equal to 5.0 % Δk/k in Modes 1, 2, 3, and 4.

2) 3/4.1.1.2 - SHUTDOWN MARGIN - $T_{avg} \leq 200$ °F

The SHUTDOWN MARGIN shall be greater than or equal to 5.0% Δk/k in Mode 5.

3) 3.1.1.4 - MODERATOR TEMPERATURE COEFFICIENT

The Moderator Temperature Coefficient (MTC) shall be in accordance with Figure 1. The Beginning of Cycle (BOC) positive COLR MTC limit line of Figure 1 is from BOC to 140.0 EFPD. From 380.0 EFPD to End of Cycle (EOC) the positive COLR MTC limit line is linear from an MTC of 0.0 E-4 Δk/k/°F at 0% power to an MTC of -1.0 E-4 Δk/k/°F at 100% power, which is bounded by the BOC positive MTC limit. Between 140.0 EFPD and 380.0 EFPD the positive MTC limit may be interpolated linearly with burnup.

4) 3.1.3.1 - CEA POSITION

With one or more CEAs trippable but misaligned from any other CEAs in its group by more than the Technical Specification 3.1.3.1 allowed value, the minimum required core power reduction for Modes 1 and 2 is specified in Figure 2.

5) 3.1.3.6 - REGULATING CEA INSERTION LIMITS

The regulating CEA groups and Group P shall be limited to the withdrawal and insertion limits shown on Figure 3. Figure 3 assumes that Groups 1 through 5 are maintained at or above the Programmed Insertion Limit.

6) 3/4.2.1 - LINEAR HEAT RATE

With COLSS out of service, the linear heat rate shall be maintained ≤ 13.7 kW/ft.

7) 3.2.3 - AZIMUTHAL POWER TILT- T_q

The measured AZIMUTHAL POWER TILT shall be maintained ≤ 0.03.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ____________

SYSTEM/DUTY AREA: Equipment Controls

TASK: Determine CREVS TS/TRM applicability and any required actions.

JTA#: ANO-SRO-ADMIN-NORM-103

KA VALUE RO: 3.6 SRO: 4.6 KA REFERENCE: 2.2.37

APPROVED FOR ADMINISTRATION TO: RO: ______ SRO: X

TASK LOCATION: INSIDE CR: ______ OUTSIDE CR: ______ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____________ SIMULATOR: Perform CLASSROOM: Perform

POSITION EVALUATED: RO: ____________ SRO: ____________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: _____ PLANT SITE: _____ CLASSROOM: _____

TESTING METHOD: SIMULATE: ________ PERFORM: ________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): 2104.007, Control Room Emergency Ventilation, Unit 2 Tech Specs.

EXAMINEE'S NAME: ______________________________ Badge #: ____________

EVALUATOR'S NAME: ______________________________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____________ UNSATISFACTORY: ____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ________ Stop Time ________ Total Time ________

SIGNED: ______________________________ DATE: ____________

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

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1 at 100% power.
- Unit 2 is loading a dry fuel cask with irradiated fuel.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a Unit 1 B55 bus outage.
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.
- The Control Room is on emergency recirc with 2VSF-9 Unit 2 Emergency Filter/Fan running.

NOW

- I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to a chlorine test surveillance.
- The CBOT discovers that 2VSF-9 feeder breaker is trip free.

TASK STANDARD:

Determined that 3.0.3 is applicable as directed by TS 3.7.6.1 action e. Determined that TS 3.7.6.1 action j is also applicable requiring immediately suspending handling of irradiated fuel.

TASK PERFORMANCE AIDS:

<u>OP 2104.007, Control Room Emergency Ventilation Rev.71, Unit 2 Tech Specs Amendment #301.</u>

EXAMINER NOTES:

Determine CREVS TS/TRM applicability and any required actions. This JPM requires the SRO applicant to evaluate conditions associated with the Unit1/2 combined Control Room envelope ventilation equipment including the chlorine monitoring system and the emergency ventilation units. There are a total of 4 chlorine monitors – 2 on Unit 1 and 2 on Unit 2. As long as there is at least one chlorine monitor operable on each unit with opposite train power supplies, there are no TRM action requirements applicable. Based on the given conditions, both trains of emergency ventilation are inoperable which will require entry into TS 3.0.3 as directed by TS 3.7.6.1 action e. to correct the condition within one

ADMINISTRATIVE JOB PERFORMANCE MEASURE

hour or commence a shutdown and to suspend loading irradiated fuel into the Unit 2 Dry Fuel Cask.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Determine all applicable Unit 2 Tech Specs/TRM requirements associated with Control room ventilation. Include any applicable TS/TRM required actions for the given plant conditions.

START TIME: _______________

	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	1. Review OP 2104.007 attachment B and C, Control Room Emergency Ventilation and TS 3.7.6.1.	Examinee reviewed the control room ventilation procedure and Tech Specs.	N/A SAT UNSAT
	2. Using attachment C of 2104.007 determine that TRM entry is not required for the inoperable chlorine monitors.	Examinee determined that TRM entry is not required for chlorine monitors that are inoperable.	N/A SAT UNSAT
EXAMINER NOTE: The candidate may indicate TS 3.7.6.1 action e. is applicable. TS 3.7.6.1 action 'e' states to apply the actions of TS 3.0.3			
(C)	3. Using TS and 2104.007 determine applicable TS actions.	Examinee determined that TS 3.0.3 is applicable based on TS 3.7.6.1 action e.	N/A SAT UNSAT
(C)	4. Using TS and 2104.007 determine applicable TS actions.	Examinee determined that TS 3.7.6.1 action j is applicable.	N/A SAT UNSAT
(C)	5. Determine required action IAW TS.	Determined the following action of T.S 3.7.6.1 j: Immediately suspend handling of irradiated fuel.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

	PERFORMANCE CHECKLIST	STANDARD	(Circle One)
(C)	5. Determine required action IAW TS.	Determined the following action of T.S 3.0.3: Within 1 hour, action shall be initiated to place the unit in a mode in which the specification does not apply.	N/A SAT UNSAT
	END		

STOP TIME: ________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1 at 100% power.
- Unit 2 is loading a dry fuel cask with irradiated fuel.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a Unit 1 B55 bus outage.
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.
- The Control Room is on emergency recirc with 2VSF-9 Unit 2 Emergency Filter/Fan running.

NOW

- I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to a chlorine test surveillance.
- The CBOT discovers that 2VSF-9 feeder breaker is trip free.

INITIATING CUE:

Determine all applicable Unit 2 Tech Specs/TRM requirements associated with Control room ventilation. Include any applicable TS/TRM required actions for the given plant conditions.

Applicable Tech Specs/TRM: _TS 3.7.6.1 Action j and TS 3.0.3 as directed by TS 3.7.6.1 action e.

Required Tech Specs/TRM actions:

T.S 3.7.6.1Action j: immediately suspend all activities involving the handling of irradiated fuel.

T.S 3.0.3:
Within 1 hour, action shall be initiated to place the unit in a mode in which the specification does not apply.

.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- Unit 1 is in Mode 6 for a refueling outage and currently de-fueled.
- Unit 2 is in Mode 1 at 100% power.
- Unit 2 is loading a dry fuel cask with irradiated fuel.
- VSF-9 Unit 1 Emergency Filter/Fan is tagged out to align power from Unit 2 for a Unit 1 B55 bus outage.
- Chlorine Detector 2CLS-8761-1 is inoperable and bypassed due to sample pump failure.
- The Control Room is on emergency recirc with 2VSF-9 Unit 2 Emergency Filter/Fan running.

NOW

- I&C reports that 2CLS-8762-2 is inoperable because it will not actuate in response to a chlorine test surveillance.
- The CBOT discovers that 2VSF-9 feeder breaker is trip free.

INITIATING CUE:

Determine all applicable Unit 2 Tech Specs/TRM requirements associated with Control room ventilation. Include any applicable TS/TRM required actions for the given plant conditions.

Applicable Tech Specs/TRM:

____

Required Tech Specs/TRM actions:

____
____
____
____
____
____
____
____
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____
____

ATTACHMENT B

COMPONENT/TECH SPEC CROSS-REFERENCE

INSTRUCTIONS

- Refer to Table 1 for Component Tech Spec Cross-reference.
- Refer to Table 2 for Alternate power sources to CREVS/CREACS components.
- Refer to Table 3 for actions that should be taken due to a loss of power for CREVS components and applicable Tech Specs.
- Refer to Table 4 for fail safe and non-fail safe components.
- Refer to the flow chart on the last page of this attachment for Tech Spec implications due to Radiation monitor inoperability.

TABLE 1
COMPONENT TECH SPEC CROSS-REFERENCE

COMPONENT	**UNIT 1 Tech Spec**	**UNIT 2 Tech Spec**
VSF-9, **2**VSF-9	TS 3.7.9 (Notes 1-14, 21, 22, 23, 24)	TS 3.7.6.1 (Notes 1-14, 21, 22, 23, 24)
2VUC-27A Fan or Heater	TS 3.7.10 (Notes 1-7, 15-17, 24)	TS 3.7.6.1 (Notes 1-7, 15-17, 24)
2VUC-27B Fan or Heater	TS 3.7.10 (Notes 1-7, 15-17, 24)	TS 3.7.6.1 (Notes 1-7, 15-17, 24)
2VE-1A, 2VE-1B	TS 3.7.10 (Notes 1-7, 15-17, 24)	TS 3.7.6.1 (Notes 1-7, 15-17, 24)
CV-7905, CV-7907	TS 3.3.16 and TS 3.7.9 (Notes 1-14, 19, 20, 24)	TS 3.7.6.1 (Notes 1-14, 19, 20, 24)
2UCD-8683, 2PCD-8685	TS 3.3.16 and TS 3.7.9 (Notes 1-14, 19, 20, 24)	TS 3.7.6.1 (Notes 1-13, 19, 20, 24)
QS-7905, QS-7907	None (Notes 11, 12)	None (Notes 11, 12)
2XSH-8740A/B, 2XSH-8741A/B	None (Notes 11, 12)	None (Notes 11, 12)
Chlorine Detectors	TRM 3.3.1 (Notes 9,10,11, 13,18-20)	TRM 3.3.7 (Notes 9,10,13,18-20)
2RITS-8001A OR 2RITS-8001B	TS 3.3.16, (Notes 9,10,11, 14,18-20, 24)	TS 3.3.3.1, Table 3.3-6 (Notes 9,10,14,18-20, 24)
2RITS-8750-1A OR 2RITS-8750-1B	TS 3.3.16, (Notes 9,10,11, 14,18-20, 24)	TS 3.3.3.1, Table 3.3-6 (Notes 9,10,14,18-20, 24)

Unit 2 TS 3.7.6.1 and TS 3.0.3 is applicable for the Emergency Ventilation Units. See Note 1 below and TS 3.7.6.2 Action e. and j.

Unit 2 TRM 3.3.7 is not Applicable for the Chlorine Detectors. See 2104.007 Attachment C flowchart 5 pages below.

ATTACHMENT B

NOTES:

1.0 For Unit 1: In Modes 1, 2, 3, 4 AND any time when handling irradiated fuel (ref. note 6), BOTH CREVS and CREACS trains must be operable as required by Technical Specifications. TS power supplies required to support train operability must remain separated AND redundant.

For Unit 2: In Modes 1, 2, 3, 4 AND any time when handling irradiated fuel (ref. note 6), BOTH CREVS and CREACS trains must be operable as required by Technical Specifications. TS power supplies required to support train operability must remain separated AND redundant.

2.0 When BOTH CREVS or CREACS trains are powered from Unit 2, operability is maintained provided both NORMAL and EMERGENCY power supplies remain separate and redundant with respect to the individual trains. If 2A3/4 OR 2B5/6 cross-tied, separation is lost and each Unit must consider ONE train INOPERABLE. Train considered inoperable may be different for each Unit.

3.0 When BOTH CREVS or CREACS trains are powered from Unit 1, electrical separation is lost. Therefore, each Unit must consider one train inoperable. Train considered inoperable may be different for each Unit.

4.0 When a CREVS or CREACS component (including Service Water loop supporting an operable CREACS train) is powered from the OPPOSITE Unit AND its associated NORMAL or EMERGENCY power source is INOPERABLE, Unit from which the component or loop is NOT aligned must consider the affected non-fail safe CREVS or CREACS components inoperable (See Exception – Note 5). This ensures operation in a degraded state is restricted since inoperability of one Units NORMAL or EMERGENCY power supply does not inherently result in TS entry for the other Unit. Unit from which the affected train is aligned must comply with the applicable electrical specifications of TS Section 3.8 (includes TS 3.0.5 for Unit 2).

5.0 When 2DG1 is INOPERABLE, Unit 1 is NOT required to consider **2**VSF-9 INOPERABLE provided ALL the following are true:

- VSF-9 is OPERABLE, aligned from Unit 1, and capable of auto-start
- **2**VSF-9 is capable of being manually aligned to be powered from OPERABLE 2DG2.

This is an exception to the requirements presented in Note 4 above. (LIC-02-005).

NOTE

The License Bases are unit dependent (i.e. U1 TSs, SAR etc. are based on U1 accidents and not Unit 2 accidents) therefore fuel handling on one unit does not constitute fuel handling on the other unit. If equipment required for fuel handling is OOS on the unit handling fuel, then that unit would enter the required actions/conditions as required by the License Bases.

6.0 The definition of handling/movement of irradiated fuel is different for Unit 1 and Unit 2 as described below. Furthermore, the Tech Spec application for handling/movement of irradiated fuel is Unit specific. For example, during handling/movement of irradiated fuel on Unit 1, the Unit 2 Tech Specs do NOT apply and vice versa.

For Unit 1: Movement of irradiated fuel is defined as follows:

- The movement of an IRRADIATED fuel assembly in EITHER the Unit 1 Reactor Building or the Unit 1 Fuel Pool area at any time.
  - CEA shuffle, new fuel movement, movement of dummy assemblies, movement of the incore trash can, movement of fuel reconditioning equipment, and sealed cask movements (i.e. when both lids are welded in place) are NOT considered part of irradiated fuel handling/movement.

For Unit 2: Handling of irradiated fuel is defined as follows:

- The movement of ANY fuel assembly over irradiated fuel in EITHER the Unit 2 Reactor Building or the Unit 2 Fuel Pool area at any time. The movement of new fuel or a dummy assembly, if moved or suspended over one or more irradiated fuel assemblies **IS** considered irradiated fuel handling/movement.
- The movement of an IRRADIATED fuel assembly in EITHER the Unit 2 Reactor Building or the Unit 2 Fuel Pool area at any time.
  - CEA shuffle, movement of the incore trash can, movement of fuel reconditioning equipment and sealed cask movements (i.e. when both lids are welded in place) are NOT considered part of irradiated fuel handling/movement.

(Originally put in place by CR-ANO-C-1999-0054. Related to CR-ANO-C-2002-0334, CR-ANO-1-2002-0481)

7.0 UNIT 2 ONLY: During handling of irradiated fuel (ref. note 6) (when in Modes other than 1, 2, 3, or 4, the inoperability of a NORMAL or EMERGENCY power supply to a CREVS or CREACS train constitutes inoperability of an associated non-fail safe train/component (TS 3.0.5 does not apply). For example, during handling/movement of irradiated fuel on Unit 2 while in Mode 5, 6 or defueled: (CR-ANO-2-2012-02421-CA-3)

- Unit 2 must consider 2VSF-9 inoperable if 2DG1 is inoperable.
- Unit 2 must consider 2VE-1A inoperable if 2DG1 is inoperable.
- Unit 2 must consider 2VE-1B inoperable if 2DG2 is inoperable.

8.0 When **2**VSF-9 is aligned from Unit 1 power, Unit 2 must consider **2**VSF-9 inoperable since Auto-start capability is lost (C19 handswitch for **2**VSF-9 does not have an AUTO position). If VSF-9 is operable with Auto-start capability, this configuration does NOT impact Unit 1. If Control Rooms are automatically or manually placed on Emergency Recirculation, no TS and TRM entries are required for EITHER Unit.

9.0 TS and TRM actions associated with Control Room Radiation Monitor or Chlorine Detector inoperability are sufficient to ensure operability is restored or Control Room is placed in the fail-safe mode (Emergency Recirculation). Therefore, if Auto-start capability for EITHER Emergency Recirculation fan is lost due solely to inoperability of Control Room Radiation Monitor or Chlorine Detectors, VSF-9 or **2**VSF-9 is NOT considered inoperable.

10.0 If VSF-9 AND **2**VSF-9 are NOT capable of Auto-start for reasons other than Control Room Radiation Monitor or Chlorine Detector inoperability, Unit 1 must consider ONE fan inoperable. Unit 2 must consider BOTH fans inoperable. Placing Control Room in Emergency Recirculation mode will restore fan operability for BOTH units since Auto-start capability is NOT required when Control Room safety function is being maintained.

11.0 Actuation of Smoke Detector (2XSH-8741A/B, in Unit 2 Supply Duct) <u>OR</u> (QS-7905 in Unit 1 Supply Duct) will cause the respective Supply Damper to close rendering the respective Radiation Monitors and Chlorine Detectors in the duct inoperable due to loss of air flow to the monitors/detectors. If Control Rooms are automatically <u>or</u> manually placed on Emergency Recirculation, TS and TRM entries are NOT required for EITHER Unit. TS/TRM entry for Chlorine and Radiation Monitors during the testing of Smoke Detectors is NOT required provided the Control Rooms are restored to NORMAL operation <u>OR</u> automatically or manually placed on Emergency Recirculation WITHOUT DELAY.

12.0 With QS-7905 actuated, VSF-9 is interlocked OFF causing a loss of auto-start capability. Therefore, Unit 2 must consider VSF-9 inoperable. If **2**VSF-9 is OPERABLE with Auto-start capability, Unit 1 is NOT impacted by this event.

13.0 Chlorine Detectors, per TRMs, are required to be operable in Modes 1 and 2 for Unit 1 <u>AND</u> in Modes 1, 2, 3, and 4 for Unit 2. Chlorine Detectors are NOT required to be operable during handling of irradiated fuel (ref. note 6).

14.0 Two of the four Radiation Monitors must be OPERABLE to satisfy Unit 1 and Unit 2 Tech Specs. The TWO must be comprised of the following: ONE Unit 1 monitor (2RITS-8001A or 2RITS-8001B) <u>AND</u> ONE Unit 2 monitor (2RITS-8750-1A or 2RITS-8750-1B). See flow chart on last page of this Attachment for further TS guidance.

15.0 In accordance with U2 T.S. 3.3.3.1 (Table 4.3-3) and U1 T.S. 3.3.16 (SR 3.3.16-2), when the Control Room Ventilation Intake Duct Monitor is placed in an inoperable status solely for performance of the Monthly functional Test Surveillance, entry into associated ACTIONS may be delayed up to 3 hours.

16.0 When EITHER CREACS train is electrically aligned from Unit 1, Unit 2 must consider the train inoperable since manual start cannot be accomplished from Control Room. This configuration does NOT impact Unit 1.

ATTACHMENT C

PAGE 1 OF 2

CHLORINE DETECTOR MATRIX

DETECTOR POWER SUPPLY UNIT DUCT	2CLS-8760-2 2RS-2 Bkr 8 UNIT 1	2CLS-8762-2 2RS-2 Bkr 8 UNIT 2	2CLS-8761-1 2RS-1 Bkr 8 UNIT 1	2CLS-8763-1 2RS-1 Bkr 8 UNIT 2
2CLS-8760-2 2RS-2 Bkr 8 UNIT		Same Power Different Unit (TRM entry Req.)	Different Power Same Unit (TRM entry Req.)	Fully Independent (No TRM entry)
2CLS-8762-2 2RS-2 Bkr 8 UNIT 2	Same Power (Different Unit TRM entry Req.)		Fully Independent (No TRM entry)	Different Power Same Unit (TRM entry Req.)
2CLS-8761-1 2RS-1 Bkr 8 UNIT 1	Different Power Same Unit (TRM entry Req.)	Fully Independent (No TRM entry)		Same Power Different Unit (TRM entry Req.)
2CLS-8763-1 2RS-1 Bkr 8 UNIT 2	Fully Independent (No TRM entry)	Different Power Same Unit (TRM entry Req.)	Same Power Different Unit (TRM entry Req.)	

1.0 With any ONE detector out of service, operability is maintained as required by TRMs.

2.0 Refer to the flow chart on the last page of this Attachment for TRM guidance relative to Chlorine Detector INOPERABILITY.

3.0 Fully Independent means detectors are powered from opposite ESF trains, sample different ducts, and can BOTH be out of service without a loss of operability. For example, 2CLS-8763-1 AND 2CLS-8760-2 can be out of service AND operability will be maintained.

4.0 If Same Unit and Same Power detectors are out of service simultaneously, operability can NOT be maintained. For example, 2CLS-8760-2 AND 2CLS-8762-2 can NOT be out of service and maintain operability per the TRM.

5.0 Chlorine Detectors are powered from Unit 2 Emergency power supplies. If these power supplies are removed from service, the detectors are bypassed using Unit 2 Chlorine Bypass switches on C141A and C141B in the Computer Room to prevent spurious alarms in Unit 1.

6.0 IF ANY Chlorine Detector inoperable
AND Unit 1 or Unit 2 TRM does NOT requires Control Room isolation,
THEN detector may be disabled by performing the following:

6.1 Push AND hold reset button on INOPERABLE detector.

6.2 Unplug sensor by pulling down on connector (located directly below push buttons on bottom of control module).

6.3 Release reset button.

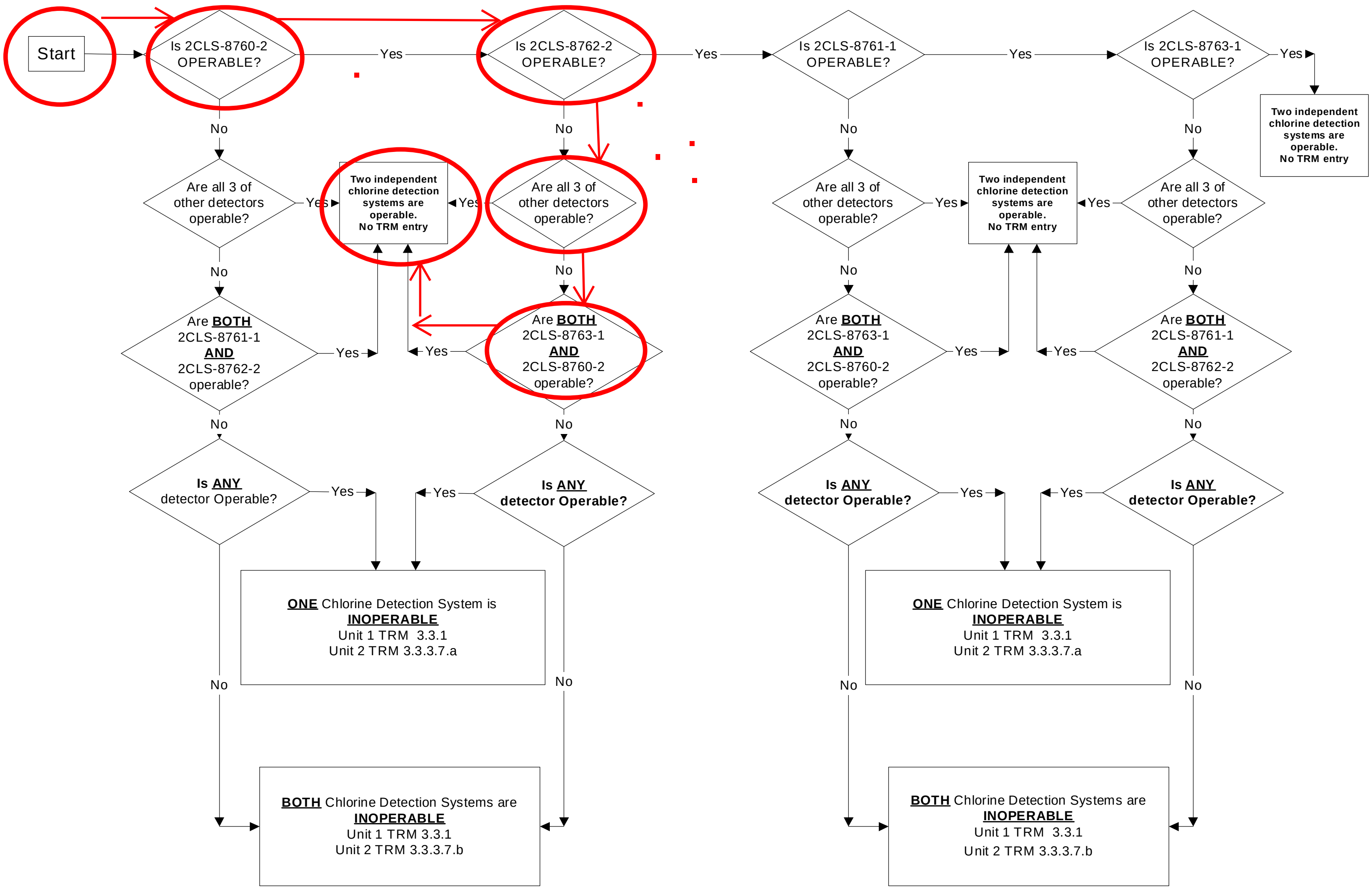
6.4 Restore Control Room ventilation as desired.

6.5 Initiate LCO Tracking Record.

ATTACHMENT C

NOTE

- If Control Room NOT on Emergency Recirc, this Flow Chart is applicable.
- If Control Room aligned for Emergency Recirculation OR in the process of being placed on Recirc, then TS entry is NOT required for Control Room Rad Monitors



3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION AND AIR CONDITIONING SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.6.1 Two independent control room emergency ventilation and air conditioning systems shall be OPERABLE. (Note 1)

APPLICABILITY: MODES 1, 2, 3, 4, or during handling of irradiated fuel.

ACTION:

MODES 1, 2, 3, and 4

a. With one control room emergency air conditioning system (CREACS) inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one control room emergency ventilation system (CREVS) inoperable for reasons other than ACTION d, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

c. With one CREVS inoperable for reasons other than ACTION d and one CREACS inoperable, restore the inoperable CREVS to OPERABLE status within 7 days and restore the inoperable CREACS to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

d. With one or more CREVS inoperable due to an inoperable CRE boundary:

   1. Immediately initiate action to implement mitigating actions, and

   2. Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits within 24 hours, and

   3. Restore the CRE boundary to OPERABLE status within 90 days

   Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

e. With two CREVS inoperable for reasons other than ACTION d or with two CREACS inoperable, enter Specification 3.0.3.

Note 1: The control room envelope (CRE) boundary may be open intermittently under administrative controls.

3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION AND AIR CONDITIONING SYSTEM

LIMITING CONDITION FOR OPERATION

During Handling of Irradiated Fuel

f. With one CREACS inoperable, restore the inoperable system to OPERABLE status within 30 days or immediately place the OPERABLE system in operation; otherwise, suspend all activities involving the handling of irradiated fuel.

g. With one CREVS inoperable, restore the inoperable system to OPERABLE status within 7 days or immediately place the control room in the emergency recirc mode of operation; otherwise, suspend all activities involving the handling of irradiated fuel.

h. With one CREVS inoperable for reasons other than ACTION d and one CREACS inoperable:

    1. restore the inoperable CREVS to OPERABLE status within 7 days or immediately place the CRE in the emergency recirc mode of operation, and

    2. restore the inoperable CREACS to OPERABLE status within 30 days or immediately place the OPERABLE system in operation;

    3. otherwise, suspend all activities involving the handling of irradiated fuel.

i. With both CREACS inoperable, immediately suspend all activities involving the handling of irradiated fuel.

j. With both CREVS inoperable or with one or more CREVS inoperable due to an inoperable CRE boundary, immediately suspend all activities involving the handling of irradiated fuel.

3/4.0 APPLICABILITY

LIMITING CONDITION FOR OPERATION

3.0.1 Limiting Conditions for Operation (LCO) and ACTION requirements shall be applicable during the OPERATIONAL MODES or other conditions specified for each specification, except as provided in LCO 3.0.2 and 3.0.8.

3.0.2 Adherence to the requirements of the Limiting Condition for Operation and/or associated ACTION within the specified time interval shall constitute compliance with the specification, except as provided in Specification 3.0.6. In the event the Limiting Condition for Operation is restored prior to expiration of the specified time interval, completion of the ACTION statement is not required.

3.0.3 In the event a Limiting Condition for Operation and/or associated ACTION requirements cannot be satisfied because of circumstances in excess of those addressed in the specification within 1 hour, action shall be initiated to place the unit in a mode in which the specification does not apply by placing it, as applicable, in at least HOT STANDBY within 6 hours, in at least HOT SHUTDOWN within the next 6 hours, and in at least COLD SHUTDOWN within the following 24 hours unless corrective measures are completed that permit operation under the permissible ACTION statements for the specified time interval as measured from initial discovery or until the reactor is placed in a MODE in which the specification is not applicable. Exceptions to these requirements shall be stated in the individual specification.

3.0.4 When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:

a. When the associated ACTIONs to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;

b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this Specification are stated in the individual Specifications, or

c. When an allowance is stated in the individual value, parameter, or other Specification.

This specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONs or that are part of a shutdown of the unit.

Figures:

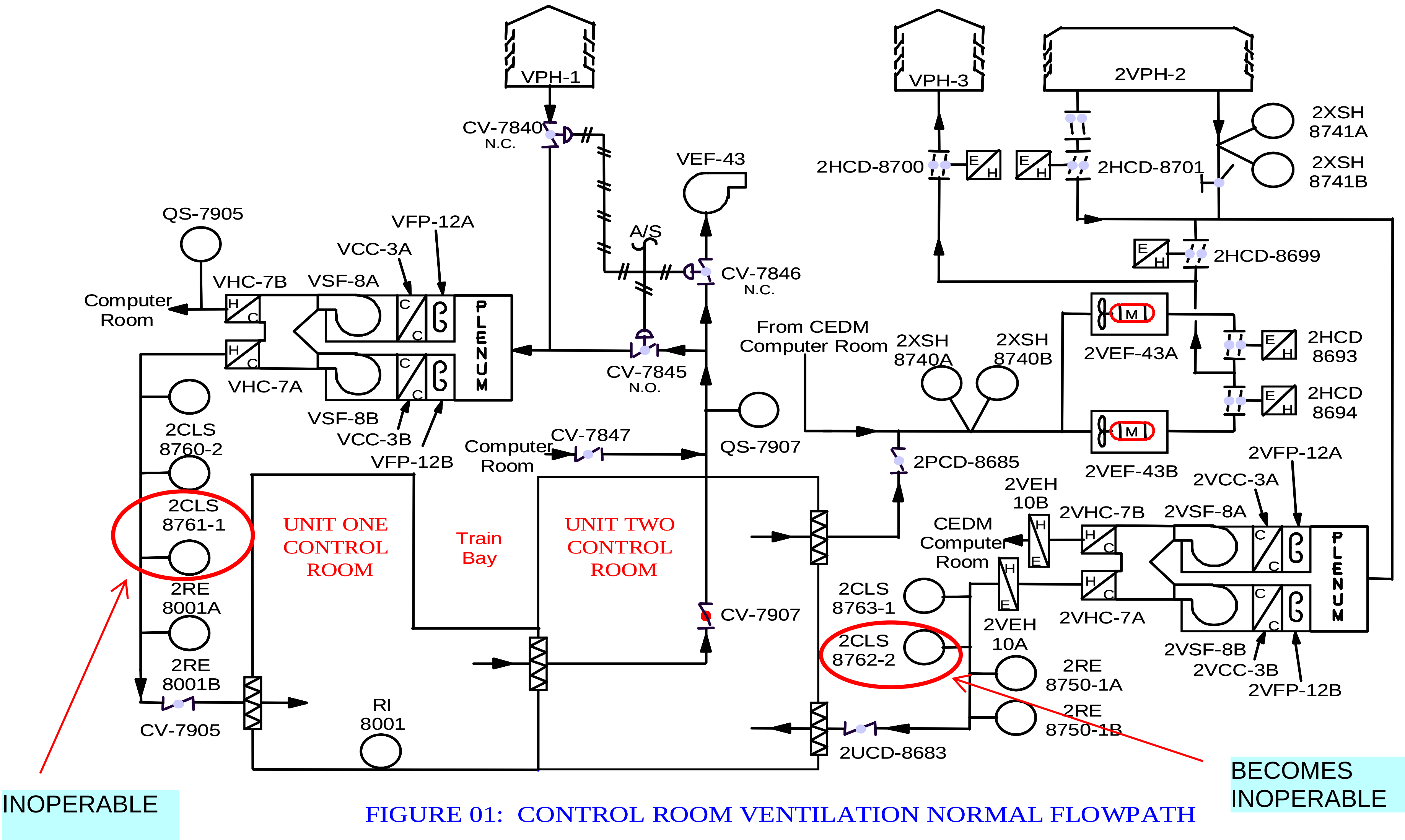


FIGURE 01: CONTROL ROOM VENTILATION NORMAL FLOWPATH

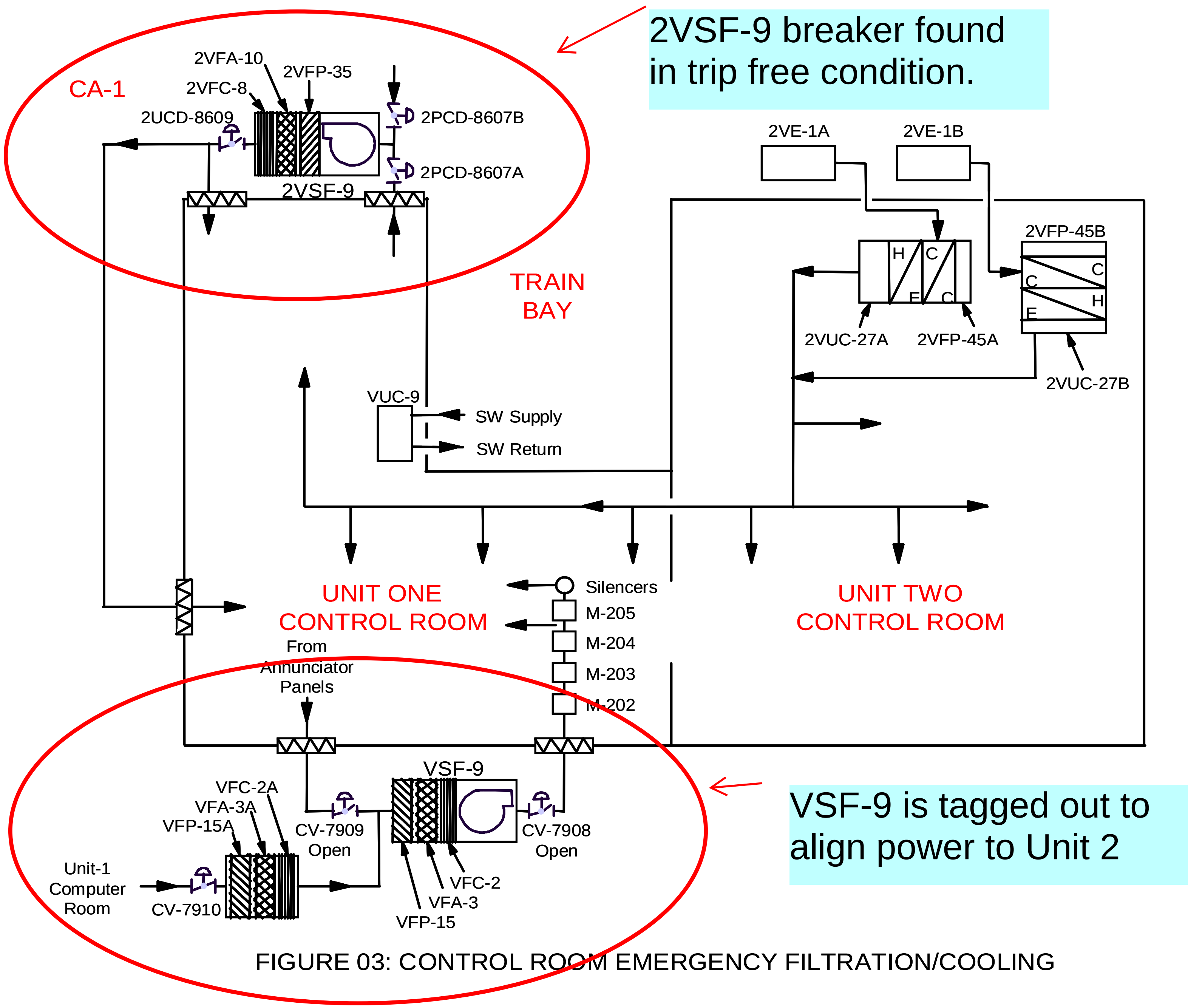


FIGURE 03: CONTROL ROOM EMERGENCY FILTRATION/COOLING

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ______

SYSTEM/DUTY AREA: Radiation Controls

TASK: Approve administration of Potassium Iodide.

JTA#: ANO-SRO-EPLAN-EMERG-292

KA VALUE RO: 3.4 SRO: 3.8 KA REFERENCE: 2.3.14

APPROVED FOR ADMINISTRATION TO: RO: ______ SRO: X

TASK LOCATION: INSIDE CR: ______ OUTSIDE CR: ______ BOTH: X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______ SIMULATOR: Perform CLASSROOM: Perform

POSITION EVALUATED: RO: ______ SRO: ______

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ CLASSROOM: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): 1903.035, Administration of Potassium Iodide

EXAMINEE'S NAME: ______ Badge #: ______

EVALUATOR'S NAME: ______

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______ UNSATISFACTORY: ______

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ______ Stop Time ______ Total Time ______

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The plant is tripped from 100% power
- 300 gpm LOCA in progress
- Loss of Offsite power is in progress
- RDACS indicates an offsite release in progress
- RP estimates that it will take approximately 15 minutes in the USPPR to complete required actions to stop the release and all RP required controls/authorizations are complete.
- Data indicates I-131 concentration in area of work in the Upper South Piping Penetration Room (USPPR) is 8.0 E-05 μci/cc
- Whole body dose rates in area of work are 1R/hr
- Site Area Emergency has been declared
- Joe Mechanic's KI Training (ASCBT-EP-OSCBRF) is NOT current.
- Joe Mechanic has read Attachment 2, "Consumer Package Insert" and has chosen to take Potassium Iodide if required
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference
- EOF, OSC and TSC are being staffed but are NOT operational

TASK STANDARD:

Applicant determined that Potassium Iodide is required to be administered for this task IAW 1903.035 due to exceeding 10 REM CDE Thyroid; however, Joe Mechanic should not be administered due to his allergic reaction to shell fish.

TASK PERFORMANCE AIDS: 1903.0035, Potassium Iodide Administration Rev. 15, Form 1903.035C (Completed), ANO Medical Questionnaire-Iodine Sensitivity and Form 1903.035A, Potassium Iodide Administration.

EXAMINER NOTES:

Approve administration of Potassium Iodide. In this administrative JPM, an individual has been selected to enter an area of high I-131 concentration to stop a release. The applicant must determine if the individual should be approved to have Potassium Iodide (KI) administered to him. The concentration of I-131 concentration will be determined to be high enough that KI is required to be administered. However, based on the medical questionnaire filled out by the individual the applicant should determine that the individual is allergic to shellfish/KI and thus cannot have KI administered to them. Another individual will need to be selected for the task

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE:

Complete FORM OP-1903.035A and determine if KI, Potassium Iodide, is or is not required to be administered for this task. Also determine if Joe Mechanic should or should not be approved to Joe Mechanic IAW OP 1903.035 Administration of Potassium Iodide.

START TIME: _______________

		PERFORMANCE CHECKLIST	STANDARD	(Circle One)
EXAMINER NOTE: Provide the examinee a KI Administration Form 1903.035A and a Medical Questionnaire-Iodine Sensitivity Form 1903.035C that has been completed by Joe Mechanic				
	1. (Step 6.1)	Review 1903.035, Administration of Potassium Iodide to determine criteria for administering KI.	Examinee determined the criteria for administration of KI to an individual is a dose commitment of 10 REM or greater exposure to thyroid committed dose equivalent (CDE)	N/A SAT UNSAT
	2. (Step 6.2.2)	Refer to Attachment 3, “Potassium Iodide Flowchart” as Necessary	Referred to and used Attachment 3, “Potassium Iodide Flowchart” to assist in decision to administer Potassium Iodide.	N/A SAT UNSAT
(C)	3. (Step 6.2.5)	Using graph on 1903.035 Attachment 1 and information provided in initial conditions, determine that Joe Mechanic will exceed 10 REM during the maintenance evolution.	On Attachment 1, Thyroid Committed Dose Equivalent Graph, determined that expected exposure will exceed 10 REM threshold for 15 minutes of work at I-131 concentration of 8.0 E-05 μci/cc. Determined that these conditions will require administration of Potassium Iodide.	N/A SAT UNSAT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

		PERFORMANCE CHECKLIST	STANDARD	(Circle One)
	4. (Step 6.3)	Review and fill out form 1903.035A Potassium Iodide (KI) Administration Form	Completed all areas of form 1903.035A, Potassium Iodide Administration, from initial conditions: • Badge Number • Duration of Exposure • I-131 Concentration • Estimated Thyroid dose commitment. • Respiratory Protection Factor.	N/A SAT UNSAT
	5. (Step 6.5.1)	Determine that Joe Mechanic is sensitive to and has experienced an allergic reaction to shellfish/Iodide.	Reviewed 1903.035C form and determined that Joe Mechanic was sensitive to iodine and has experienced an allergic reaction to shellfish/iodine in the past.	N/A SAT UNSAT
(C)	6. (Step 6.5.2)	Determine that KI should NOT be approved for distribution to Joe Mechanic during the Upper South Piping penetration work.	Examinee applied step 6.5.2 and Caution on Form 1903.035A and did NOT approve distribution of KI to Joe Mechanic.	N/A SAT UNSAT
END				

STOP TIME: _______________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The plant is tripped from 100% power
- 300 gpm LOCA in progress
- Loss of Offsite power is in progress
- RDACS indicates an offsite release in progress
- RP estimates that it will take approximately 15 minutes in the USPPR to complete required actions to stop the release and all RP required controls/authorizations are complete.
- Data indicates I-131 concentration in area of work in the Upper South Piping Penetration Room (USPPR) is 8.0 E-05 µci/cc
- Whole body dose rates in area of work are 1R/hr
- Site Area Emergency has been declared
- Joe Mechanic's KI Training (ASCBT-EP-OSCBRF) is NOT current.
- Joe Mechanic (Badge Number 22572) has read Attachment 2, "Consumer Package Insert" and has chosen to take Potassium Iodide if required
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference
- EOF, OSC and TSC are being staffed but are NOT operational

INITIATING CUE:

Complete FORM OP-1903.035A and determine if KI, Potassium Iodide, is or is not required to be administered for this task. Also determine if Joe Mechanic should or should not be approved to Joe Mechanic IAW OP 1903.035 Administration of Potassium Iodide.

KEY

1. IAW OP 1903.035, Potassium Iodide (KI) IS IS NOT required to be administered for this task. (Circle One)

   Why: <u>Greater than 10 Rem CDE to the thyroid is likely for this task or similar wording.</u>

2. Joe Mechanic SHOULD SHOULD NOT be approved for receiving Potassium Iodide (KI). (Circle One)

   Why: <u>Joe Mechanic answered YES to Question 1 on the Form 1903.035C or similar wording to indicate Joe Mechanic is allergic to shellfish/iodine.</u>

ADMINISTRATIVE JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The plant is tripped from 100% power
- 300 gpm LOCA in progress
- Loss of Offsite power is in progress
- RDACS indicates an offsite release in progress
- RP estimates that it will take approximately 15 minutes in the USPPR to complete required actions to stop the release and all RP required controls/authorizations are complete.
- Data indicates I-131 concentration in area of work in the Upper South Piping Penetration Room (USPPR) is 8.0 E-05 μci/cc
- Whole body dose rates in area of work are 1R/hr
- Site Area Emergency has been declared
- Joe Mechanic's KI Training (ASCBT-EP-OSCBRF) is NOT current.
- Joe Mechanic has read Attachment 2, "Consumer Package Insert" and has chosen to take Potassium Iodide if required
- Air Purifying Respirator with Iodine Canister having a protection factor of 1.0 will be used in place of a SCBA due to piping interference
- EOF, OSC and TSC are being staffed but are NOT operational

INITIATING CUE:

Complete FORM OP-1903.035A and determine if KI, Potassium Iodide, is or is not required to be administered for this task. Also determine if Joe Mechanic should or should not be approved to Joe Mechanic IAW OP 1903.035 Administration of Potassium Iodide.

1. IAW OP 1903.035, Potassium Iodide (KI) IS / IS NOT required to be administered for this task. (Circle One)

   Why: ____

   ____

2. Joe Mechanic SHOULD / SHOULD NOT be approved for receiving Potassium Iodide (KI) (Circle One)

   Why: ____

   ____

Potassium Iodide (KI) Administration Form

Name of Exposed Individual: Mechanic , Joe , Robert
Last First Middle

Badge Number: ____________

Duration of Exposure: ____________ Minutes   I-131 Concentration: ____________ μCi/cc in air

Estimated Thyroid Dose Commitment:
☐ < 10 Rem ☐ ≥ 10 Rem
☐ Unknown, large exposure possible
☐ General Emergency Declared

Date of Exposure: Today

Respiratory Protection Worn During Exposure: ☐ Yes ☐ No

Respirator Protection Factor: ____________

> Note:
> Iodine Allergy / Previous Allergic Reaction to Iodine based on answers from 1903.035C ANO Medical Questionnaire-Iodine Sensitivity.

Known Iodide Allergy/Previous Allergic Reaction to iodide: ☐ Yes ☐ No

> **CAUTION**
> If the above box is checked yes, then **DO NOT** administer Potassium Iodide.

I verify that I have read and understand the precaution leaflet (Attachment 2) and I understand that taking thyroid blocking agent (KI) is strictly voluntary.

I ☒ choose to take KI   ☐ do not choose to take KI.

Joe Mechanic   Today
Signature of Exposed Individual   Date

> **NOTE**
> Shift Manager/ED/EPM approval is not required if in a General Emergency.(** Signature **NOT REQUIRED** when in a General Emergency GE)

Approved:** ____________   ____________
Shift Manager/ED/EPM   Date
☐ Check if approval is via telecom.

KI Issued By: ____________   ____________
Signature   Date

Notes: ____________

MEDICAL QUESTIONAIRE: IODINE SENSITIVITY

Name: Mechanic , Joe , Robert
LAST FIRST MIDDLE

Badge Number: 22572 Company: Entergy Dept: Mechanical Maint.

Please answer the following questions. Mark the appropriate box.

NO.	QUESTION	YES	NO
1.	When eating seafood or shellfish, do you suffer from symptoms of stomach or bowel upset or skin eruption? If so, explain below.	☒	☐
2.	Has any physician told you that you have sensitivity to iodine?	☐	☒
3.	If you have ever had a gallbladder dye test, kidney x-ray requiring dye injection or a thyroid isotope scan, were there any reactions?	☐	☒

Please explain any yes answers: Don't eat Seafood or Shellfish due to upset stomach and rash.

Print & Sign Signature: Joe Mechanic *Joe Mechanic* Date: Today

TABLE OF CONTENTS

5.0 RESPONSIBILITY AND AUTHORITY

5.1 The Radiological Coordinator (or the Shift Manager if the Radiological Coordinator is not available) is responsible for the implementation of this procedure for on-site emergency response personnel.

5.2 The Radiological Assessment Coordinator (RAC) is responsible for the implementation of this procedure for off-site emergency response personnel.

5.3 The Emergency Plant Manager (EPM) (or Shift Manager if the EPM is not available) is responsible for authorizing the administration of Potassium Iodide (KI) for on-site emergency response personnel during a non-emergency event, NUE, Alert or SAE emergency classification. During a General Emergency classification, EPM/Shift Manager approval is implied due to the procedure instructions.

5.4 The EOF Emergency Director (ED) is responsible for authorizing the administration of Potassium Iodide (KI) for offsite emergency response personnel during a non-emergency, NUE, Alert or SAE emergency classification. During a General Emergency classification, EOF ED approval is implied due to the procedure instructions.

6.0 INSTRUCTIONS

6.1 Administration of Potassium Iodide (KI) shall be performed whenever any of the following conditions exist:

6.1.1. A dose commitment of 10 Rem CDE or greater to the thyroid is likely to be received by an individual.

NA ~~6.1.2.~~ Exposure to large amounts of radioactive airborne iodine is possible and repair/damage control actions of a critical nature must occur prior to air sample analysis.

NA ~~6.1.3.~~ General Emergency

6.2 Determine the need to issue Potassium Iodide as follows:

~~6.2.1~~ In all cases where airborne contamination is anticipated, the use of proper respiratory equipment shall be considered.

6.2.2 Reference Attachment 3, “Potassium Iodide Flowchart” as necessary.

NA ~~6.2.3~~ **IF** in a General Emergency classification **AND** there are **impediments** to a plant evacuation,
THEN issue Potassium Iodide to all personnel on site except those personnel in the Control Room envelope.

A. Go to Step 6.3

NA ~~6.2.4~~ **IF** in a General Emergency classification
THEN issue Potassium Iodide to the following personnel prior to being dispatched and to personnel already in the field:

- Rescue/Repair and Damage Control personnel
- Offsite monitoring personnel
- On-shift Control Room Operations personnel **NOT** within the control room envelope. (i.e. SM, STA, RO, WCO, NLO)
- Security (affected security personnel)
- Other personnel (medical team, Engineering, etc)

6.2.5 **IF** air sample analysis is available,
THEN use Attachment 1, "Thyroid Committed Dose Equivalent Graph", to estimate the dose commitment for the thyroid.

A. **IF** the Thyroid Committed Dose Equivalent from Attachment 1 is equal to or greater than 10 Rem CDE, **THEN** administer Potassium Iodide to these personnel. Go to step 6.3

NA ~~6.2.6~~ **IF** repair/damage control actions of a critical nature must occur and **NO** air sample analysis is available,
THEN determine if exposure to significant levels of radioactive iodine is possible using the following indicators:

- SPINGS, failed fuel monitors and process monitors
- Dose Assessment
- Reactor Engineering

A. **IF** it is determined that exposure to significant levels of radioactive iodine is possible, **THEN** administer Potassium Iodide to these personnel. Go to step 6.3.

NA ~~6.2.7~~ **IF** none of the above conditions exist,
THEN exit this procedure.

NOTE
The Shift Manager, EPM, or EOF ED may approve use of Potassium Iodide in the field after the personnel have complied with the guidelines of this procedure. Approval may be obtained via telecom.

6.3 Obtain approval to issue Potassium Iodide from the Shift Manager, EPM, or EOF ED during non-emergency, NUE, Alert and SAE classifications. Indicate approval on Form 1903.035A. During a General Emergency, approval is implied due to instructional guidance to issue KI.

6.4 Have the individuals who are designated to receive Potassium Iodide perform the following:

NA ~~6.4.1~~ **IF** KI Training (ASCBT-EP-OSCBRF) **HAS BEEN** completed and is current,
THEN review of Attachment 2, Consumer Package Insert is **NOT REQUIRED**. Perform the following 2 steps.

A. Complete the appropriate sections of Form 1903.035A, Potassium Iodide Administration.

B. Complete Form 1903.035C, ANO Medical Questionnaire: Iodine Sensitivity.

6.4.2 **IF** KI Training (ASCBT-EP-OSCBRF) **HAS NOT** been completed,
THEN perform the following 3 steps.

A. Review Attachment 2, Consumer Package Insert.

B. Complete the appropriate sections of Form 1903.035A, Potassium Iodide Administration.

C. Complete Form 1903.035C, ANO Medical Questionnaire: Iodine Sensitivity.

6.5 Administration of Potassium Iodide

NOTE

Potassium Iodide is stored in the following locations:

A. TSC Emergency Kit
B. Onsite Radiological Monitoring Kit (located in the OSC)
C. EOF Emergency Kit
D. Field Monitoring Kits (located in the EOF)
E. Control Room Emergency Kit

NOTE

Potassium Iodide should be administered approximately one-half hour before exposure for maximum blockage.

Final uptake is halved if Potassium Iodide is administered within 3-4 hours after exposure.

Little benefit is gained with Potassium Iodide administration 10-12 hours after exposure.

6.5.1 Verify that each individual receiving Potassium Iodide has signed Forms 1903.035A and 1903.035C.

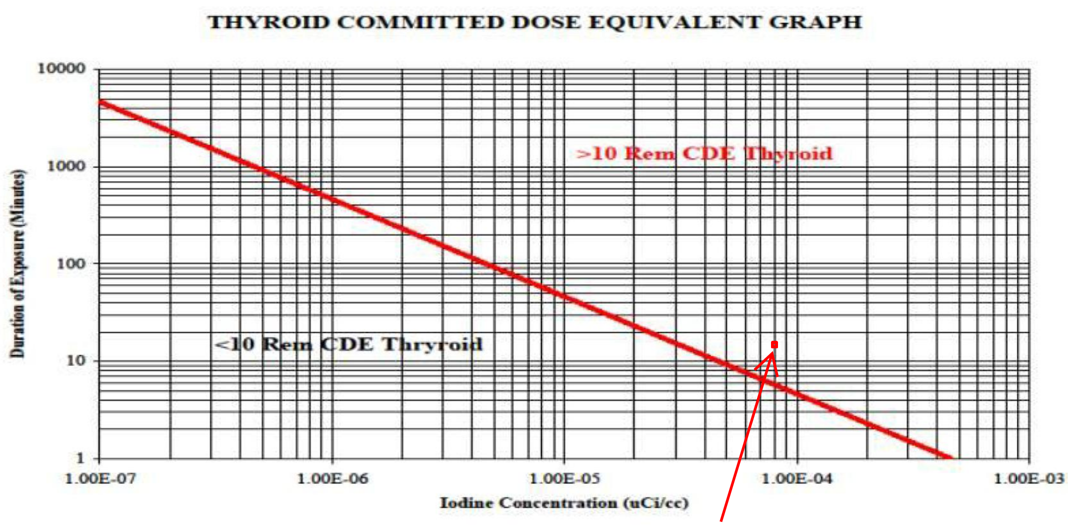
6.5.2 **IF** an individual has checked “I do not choose to take Potassium Iodide” on Form 1903.035A **OR** has answered "YES" to any question on Form 1903.035C,
THEN perform the following:

A. **DO NOT** issue Potassium Iodide to this individual

B. Take one of the following actions:

END OF JPM

Attachment 1



8.0 E-05 µci/cc and 15 minutes

Instructions for Use:

1. Determine the estimated or actual I-131 airborne concentration in the area(s) of interest. Divide this by the protection factor of the equipment used (if unknown, use 1). Locate this number on the horizontal axis.

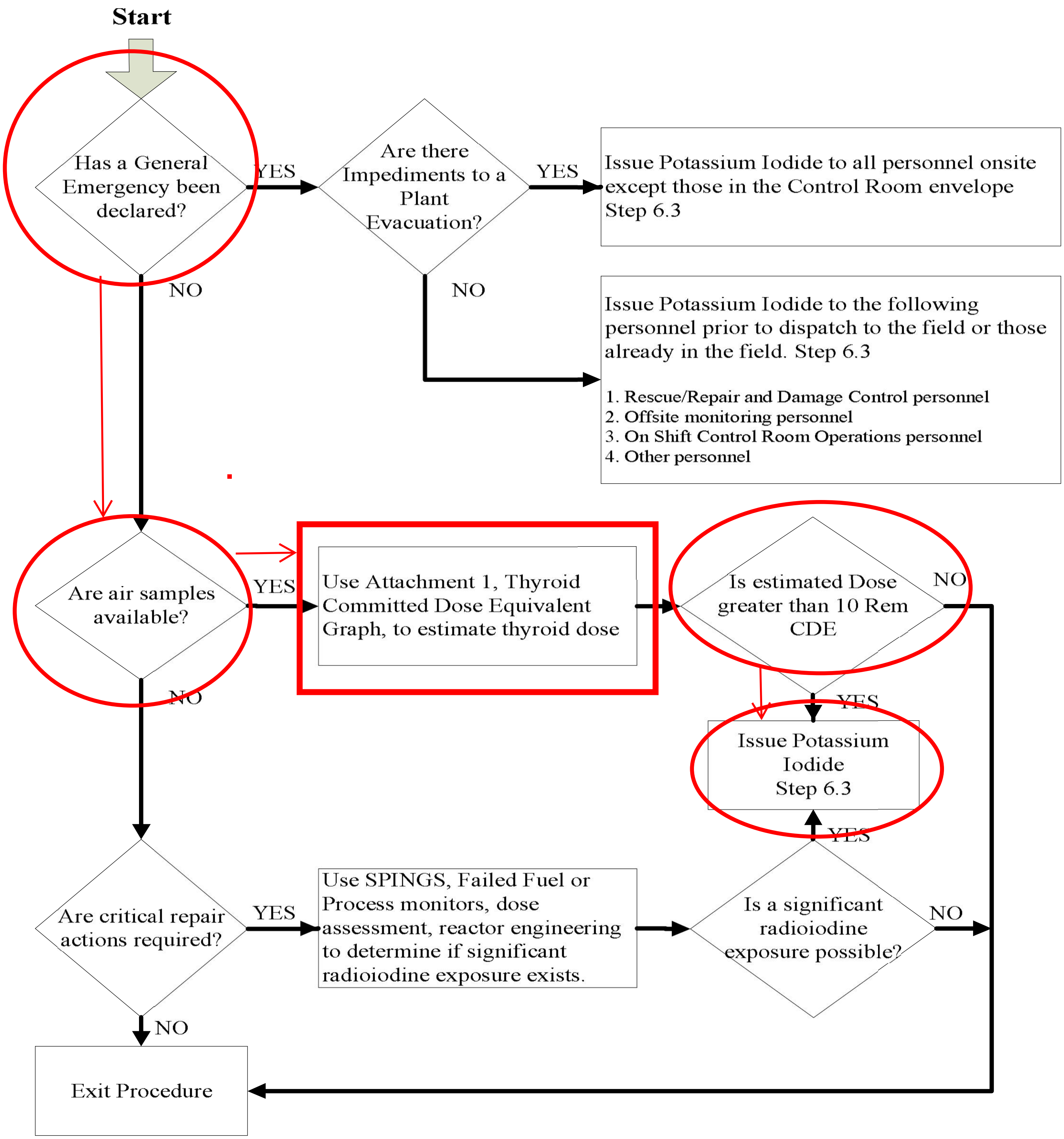
2. Locate the duration of exposure in minutes on the vertical axis. Find the point at which this value intersects with the number from step 1 above.

3. If the point of intersection is located below the line, then the thyroid CDE is less than 10 Rem.

4. If the point of intersection is located on or above the line, then the thyroid CDE is equal to or greater than 10 Rem.

ATTACHMENT 3

Potassium Iodide Flowchart



Potassium Iodide (KI) Administration Form

Name of Exposed Individual: Mechanic (Last), Joe (First), Robert (Middle)

Badge Number: 22572

Duration of Exposure: 15 Minutes (Minutes)

I-131 Concentration: 8.0 E-05 µci/cc (µCi/cc in air)

Estimated Thyroid Dose Commitment:

- ☐ < 10 Rem ☒ ≥ 10 Rem
- ☐ Unknown, large exposure possible
- ☐ General Emergency Declared

Date of Exposure: Today

Data should be completed by applicant and below checked based on Iodine Sensitivity medical questionnaire form below and step 6.5.2

Respiratory Protection Worn During Exposure: ☒ Yes ☐ No

Respirator Protection Factor: 1.0

Note:
Iodine Allergy / Previous Allergic Reaction to Iodine based on 1903.035C ANO Medical Questionnaire-Iodine Sensitivity.

Known Iodide Allergy/Previous Allergic Reaction to iodide: ☒ Yes ☐ No

CAUTION

If the above box is checked yes, then **DO NOT** administer Potassium Iodide.

I verify that I have read and understand the precaution leaflet (Attachment 2) and I understand that taking thyroid blocking agent (KI) is strictly voluntary.

I ☒ choose to take KI ☐ do not choose to take KI.

Joe Mechanic — Signature of Exposed Individual

Today — Date

NOTE

Shift Manager/ED/EPM approval is not required if in a General Emergency.(** Signature **NOT REQUIRED** when in a General Emergency GE)

Approved:** ______________________ ______________
Shift Manager/ED/EPM Date

☐ Check if approval is via telecom.

KI Issued By: ______________________ ______________
Signature Date

Notes: ____

MEDICAL QUESTIONAIRE: IODINE SENSITIVITY

Name: Mechanic , Joe , Robert
LAST FIRST MIDDLE

Badge Number: 22572 Company: Entergy Dept: Mechanical Maint.

Please answer the following questions. Mark the appropriate box.

NO.	**QUESTION**	**YES**	**NO**
1.	When eating seafood or shellfish, do you suffer from symptoms of stomach or bowel upset or skin eruption? If so, explain below.	☒	☐
2.	Has any physician told you that you have sensitivity to iodine?	☐	☒
3.	If you have ever had a gallbladder dye test, kidney x-ray requiring dye injection or a thyroid isotope scan, were there any reactions?	☐	☒

Please explain any yes answers: Don't eat Seafood or Shellfish due to upset stomach and rash.

Print & Sign Signature: Joe Mechanic *Joe Mechanic* Date: Today

ADMINISTRATIVE JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:** ____

SYSTEM/DUTY AREA: Emergency Plan

TASK: Determine Emergency Action Level (Time Critical JPM)

JTA#: ANO-SRO-EPLAN-EMERG-278

KA VALUE RO: 2.9 **SRO:** 4.6 **KA REFERENCE:** 2.4.41

APPROVED FOR ADMINISTRATION TO: RO: ____ **SRO:** X

TASK LOCATION: INSIDE CR: ____ **OUTSIDE CR:** ____ **BOTH:** X

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ **SIMULATOR:** ____ **Classroom:** Perform

POSITION EVALUATED: RO: ____ **SRO:** ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ **PLANT SITE:** ____ **LAB:** ____

TESTING METHOD: SIMULATE: ____ **PERFORM:** ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes – EAL Classification

REFERENCE(S): 1903.010 Emergency Action Level Classification

EXAMINEE'S NAME: ____ **Login ID:** ____

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ **UNSATISFACTORY:** ____

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ____ **Stop Time** ____ **Total Time** ____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS: **(Time Critical JPM)**

- Unit 2 is in cold shutdown (Mode 5) for an unplanned outage.
- Pressure Level is ~ 41%.
- RCS is intact
- Pressurizer pressure is 250 psia.
- “A” LPSI pump is in service.
- Startup #3 transformer (SU#3) is out of service maintenance.
- #2 EDG is out of service for emergent generator excitation repair work.

The following events occur:

- Startup #2 transformer (SU#2) locks out causing a loss of offsite power to Unit 2.
- #1 EDG auto starts, but immediately trips on low lube oil pressure.

15 minutes have elapsed since the loss of offsite power.

- Attempts to start the AAC generator both locally and remote have failed.
- RCS pressure 248 psia.
- RCS temperature indicates 205 degrees F.

TASK STANDARD: Determined the following (Time Critical - 15 minutes to classify event):

Determined Alert (CA-5) is the appropriate EAL. (Time Critical)

TASK PERFORMANCE AIDS: 1903.010, Emergency Action Level Classification

Determine Emergency Action Level (Time Critical JPM). The applicant must review a set of plant conditions for emergency class applicability. There will be multiple EALs applicable. The applicant must then determine the highest applicable EAL and the event code. This JPM is time critical and must be completed within 15 minutes.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

INITIATING CUE #1:

Determine the status of the EAL classification and Event number/code from the given initial conditions.

Start Time:____________________

		PERFORMANCE CHECKLIST	STANDARD	(Circle One)
(C)	1.	Determined highest applicable EAL classification level.	Declared or stated the event is an "ALERT"	N/A SAT UNSAT
(C)	2.	Determined highest applicable and event code number	Determined ALERT is due to **CA5**, Loss of all offsite and onsite AC power to vital 4.16 KV busses ≥ 15 minutes	N/A SAT UNSAT
(C)	3.	EAL determination made in 15 minutes.	EAL determined within 15 minutes. Stop Time:__________	N/A SAT UNSAT
END				

STOP:________________________

Examiner's Copy

THIS IS A TIME CRITICAL JPM.

INITIAL CONDITIONS:

- Unit 2 is in cold shutdown (Mode 5) for an unplanned outage.
- Pressure Level is ~ 41%.
- RCS is intact
- Pressurizer pressure is 250 psia.
- "A" LPSI pump is in service.
- Startup #3 transformer (SU#3) is out of service maintenance.
- #2 EDG is out of service for emergent generator excitation repair work.

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- Startup #2 transformer (SU#2) locks out causing a loss of offsite power to Unit 2.
- #1 EDG auto starts, but immediately trips on low lube oil pressure.

15 minutes have elapsed since the loss of offsite power.

- Attempts to start the AAC generator both locally and remote have failed.
- RCS pressure 248 psia.
- RCS temperature indicates 205 degrees F.

INITIATING CUE #1:

Determine the status of the EAL classification and Event number/code from the given initial conditions.

EAL Class	Event number/code
Alert	CA5

ADMINISTRATIVE JOB PERFORMANCE MEASURE

Examinee's Copy

THIS IS A TIME CRITICAL JPM.

INITIAL CONDITIONS:

- Unit 2 is in cold shutdown (Mode 5) for an unplanned outage.
- Pressure Level is ~ 41%.
- RCS is intact
- Pressurizer pressure is 250 psia.
- "A" LPSI pump is in service.
- Startup #3 transformer (SU#3) is out of service maintenance.
- #2 EDG is out of service for emergent generator excitation repair work.

The following events occur:

- Startup #2 transformer (SU#2) locks out causing a loss of offsite power to Unit 2.
- #1 EDG auto starts, but immediately trips on low lube oil pressure.

15 minutes have elapsed since the loss of offsite power.

- Attempts to start the AAC generator both locally and remote have failed.
- RCS pressure 248 psia.
- RCS temperature indicates 205 degrees F.

INITIATING CUE #1:

Determine the status of the EAL classification and Event number/code from the given initial conditions.

EAL Class	Event number/code

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:** ______

SYSTEM/DUTY AREA: Steam Dump & Bypass Control

TASK: Operate “A” Upstream Atmospheric Dump Valve locally

JTA#: ANO2-AO-SDBCS-OFFNORM-3

ALTERNATE PATH YES: ______ NO: X **TIME CRITICAL** YES: ______ NO: X

KA VALUE RO: 2.8 SRO: 3.1 **KA REFERENCE:** 041 A2.03

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: ______ OUTSIDE CR: X BOTH: ______

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: Simulate **SIMULATOR:** ______ **LAB:** ______

POSITION EVALUATED: RO: ______ SRO: ______

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ LAB: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2105.008 SDBCS OPERATIONS Rev. 30

EXAMINEE'S NAME: ______ **LOGON ID:** ______

EVALUATOR'S NAME: ______

THE EXAMINEE'S PERFORMACE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______ **UNSATISFACTORY:** ______

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ______ **Stop Time** ______ **Total Time** ______

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2PI-1007 has been aligned per 2.1 and is reading 1090 psig

TASK STANDARD:

"A" upstream atmospheric dump valve 2CV-1001 has been throttled opened to control "A" S/G pressure 950 – 1000 psig."

TASK PERFORMANCE AIDS:

OP 2105.008 Exhibit 2; flashlight

EXAMINER NOTES:

1. Two flashlights may are required for lighting. One for the instructor and one for the student

Operate "A" Upstream Atmospheric Dump Valve locally. In this JPM the applicant will locally control the upstream ADV to lower Steam generator pressure below the Main Steam Safety Valve setpoint. The applicant must first place manual pump up hydraulic pressure to allow control of the ADV. The Instrument Air is then isolated to the valve and a bleedoff plug opened to allow the stem to go down which will open the reverse seated valve. The applicant then will place the valve handle to operate to bump open the ADV.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs, "Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 step 2.3 and modulate to maintain S/G pressure 950 – 1000 psig."

START TIME: ______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER'S NOTES: **Dump valves are reverse seating. Air is on the bottom of valve and valve is air to close. Therefore when valve strokes downward valve is opening.**				
NOTE • Upstream ADVs fail open on loss of air with selector switch in OPER. • Upstream Atmospheric Dump valves are reverse seating. • Sections 1.0 and/or 2.0 may be performed in any order but sub-steps are to be performed in order.				
(C)	1. (Step 2.3.1)	Place 2CV-1001 Handle Position Selector to MAN. **Examiner Cue:** **When the applicant describes placing position selector switch in "MAN" then state as described.**	At 2CV-1001 actuator, rotated position selector switch to "MAN".	N/A SAT UNSAT
(C)	2. (Step 2.3.2)	Rotate 2CV-1001 handwheel clockwise until resistance is felt. **Examiner Cue:** **After the handwheel is simulated rotated CW state resistance felt.**	Locally, rotated 2CV-1001 handwheel CW until resistance felt	N/A SAT UNSAT
(C)	3. (Step 2.3.3)	Verify 2CV-1001 fully closed. **Examiner Cue:** **When the applicant describes that 2CV-1001 closed indication then state it is as seen.**	Verified 2CV-1001 stem position is fully closed.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	4. (Step 2.3.4)	Place 2CV-1001 Handle Position Selector to LOCK. **Examiner Cue:** **When the applicant describes placing position selector switch in "LOCK" then state as described.**	Locally, rotated handle position selector to "LOCK". (CW to center if looking down from top). (Left to center if facing straight on)	N/A SAT UNSAT
	5. (Step 2.3.5)	Close IA to 2CV-1001 (2IA-287). **Examiner Cue:** **When the applicant describes closing 2IA-287 then state as described.**	North of 2CV-1001, Closed 2IA-287 by rotating handwheel CW until resistance felt.	N/A SAT UNSAT
	6. (Step 2.3.6)	Remove 2CV-1001 local air bleed off valve cap. **Examiner Cue:** **When the applicant describes removing the local air bleed off valve cap then state as described.**	At 2CV-1001, removed the cap from one of the following bleed ports. • Air supply to the positioner. • Positioner output to the operating diaphragm.	N/A SAT UNSAT
	7. (Step 2.3.7)	Open 2CV-1001 local air bleed off valve. **Examiner Cue:** **When the applicant describes opening the local air bleed off valve the state as described.**	At 2CV-1001, opened one of the following local air bleedoff valves by rotating valve CCW and removing the plug from the bleed port. • Air supply to the positioner. • Positioner output to the operating diaphragm.	N/A SAT UNSAT
	8. (Step 2.3.8)	Open 2CV-1001 Upstream Isolation MOV (2CV-1002) **Examiner Cue:** **When the applicant describes 2CV-1002 as open then state as described.**	At 2CV-1002, checked open by visually verify valve stem position.	N/A SAT UNSAT

CAUTION

- ADV will open rapidly as hydraulic fluid is ported to release the diaphragm when Handle Position Selector is placed in OPER.
- Selecting OPER should be momentary and intermittent to prevent excessive S/G depressurization and to allow S/G pressure to stabilize.

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	9. (Step 2.3.9.A .1)	IF desired to lower S/G A pressure OR establish valve position, THEN perform the following: 1. Place 2CV-1001 Handle Position Selector in OPER. **Examiner Cue:** **When the 2CV-1001 Handle placed in "OPER". Pressure observed to be lowering and is now 950psig on 2PI-1007**	Place 2CV-1001 handle to OPER, Monitored downward movement for the valve stem on 2CV-1001 and SG pressure observed to be lowering on 2PI-1007	N/A SAT UNSAT
(C)	10. (Step 2.3.9.A. 2)	WHEN desired pressure in S/G A reached OR a more open valve position, THEN place 2CV-1001 Handle Position Selector in LOCK. **Examiner Cue:** **When the applicant describes placing position selector switch in "LOCK" then state as described.**	Locally, rotated handle position selector to "LOCK" (CW to center if looking down from top). (Left to center if facing straight on)	N/A SAT UNSAT
Examiner Cue: State Steam Generator pressure is less than 950 psi and slowly lowering.				
(C)	11. (Step 2.3.9.B. 1)	IF desired to raise S/G A pressure OR establish a more closed valve position, THEN perform the following: 1. Place 2CV-1001 Handle Position Selector in MAN. **Examiner Cue:** **When the applicant describes placing position selector switch in "MAN" then state as described.**	At 2CV-1001 actuator, rotated position selector switch to "MAN".	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	12. (Step 2.3.9.B. 2)	Rotate 2CV-1001 valve handwheel clockwise to desired S/G pressure or valve position. **Examiner Cue:** **After the handwheel is simulated rotated CW state 2CV-1001 is closing and SG pressure is now 950 psig slowly rising.**	Locally, rotated 2CV-1001 handwheel CW until 2CV-1001 begins closing.	N/A SAT UNSAT
(C)	13. (Step 2.3.9.B. 3)	Place 2CV-1001 Handle Position Selector in LOCK.	Locally, rotated handle position selector to “LOCK”. (CW to center if looking down from top). (Left to center if facing straight on)	N/A SAT UNSAT
END				

STOP TIME: ________

EXAMINER'S COPY

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2PI-1007 has been aligned per 2.1 and is reading 1090 psig

INITIATING CUE:

The SM/CRS directs, "Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 step 2.3 and modulate to maintain S/G pressure 950 – 1000 psig."

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The plant is in Mode 3 due to a station blackout.
- The MSIV's are closed.
- Instrument Air is not available from Unit 1.
- 2PI-1007 has been aligned per 2.1 and is reading 1090 psig

INITIATING CUE:

The SM/CRS directs, "Take local manual control of the "A" Upstream Atmospheric Dump Valve 2CV-1001 using OP 2105.008 Exhibit 2 step 2.3 and modulate to maintain S/G pressure 950 – 1000 psig."

MANUAL OPERATION OF UPSTREAM ATMOSPHERIC DUMP VALVES

NOTE

The following section (section 1) is a suggested strategy for performing an RCS cooldown. Deviations from this strategy are allowed.

* 1.0 IF directed to perform RCS cooldown,
THEN observe the following strategy as desired:

1.1 Request new lower S/G pressure control band.

1.2 Inform control room personnel to monitor cooldown limits.

1.3 Slowly lower S/G pressure(s) into new control band.

1.4 Repeat steps 1.1 through 1.3 as necessary until cooldown complete.

NOTE

- Upstream ADVs fail open on loss of air with selector switch in OPER.
- Upstream Atmospheric Dump valves are reverse seating.
- Sections 1.0 and/or 2.0 may be performed in any order but sub-steps are to be performed in order.

2.0 IF desired to steam S/G A,
THEN perform the following

2.1 Perform the following to place S/G A pressure indicator (2PI-1007) in service:

N/A 2.1.1 IF Non-emergency condition AND Containment controls in effect,
THEN establish "Containment Penetration Administrative Controls" IAW Conduct of Operations (1015.001) for 2MS-3005 and 2MS-3006.

2.1.2 Verify pipe cap installed downstream of 2MS-3005.

2.1.3 Verify instrument tap capped downstream of 2MS-3005.

2.1.4 Open 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3005).

2.1.5 Slowly open 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3006).

2.1.6 Verify 2PI-1007 local tubing isolation valve open.

* 2.1.7 Monitor S/G A pressure on 2PI-1007.

N/A

2.2 IF directed to control S/G A pressure using Upstream Isolation MOV (2CV-1002),
THEN perform the following:

2.2.1 Verify 2CV-1001 Handle Position Selector in OPER position.

2.2.2 Close IA to 2CV-1001 (2IA-287).

2.2.3 Remove 2CV-1001 local air bleed off valve cap.

2.2.4 Open 2CV-1001 local air bleed valve.

2.2.5 Maintain desired S/G pressure by throttling 2CV-1001 Upstream Isolation MOV (2CV-1002).

2.3 IF directed to throttle S/G A Upstream Atmospheric Dump Valve (2CV-1001),
THEN perform the following:

2.3.1 Place 2CV-1001 Handle Position Selector to MAN.

2.3.2 Rotate 2CV-1001 handwheel clockwise until resistance is felt.

2.3.3 Verify 2CV-1001 fully closed.

2.3.4 Place 2CV-1001 Handle Position Selector to LOCK.

2.3.5 Close IA to 2CV-1001 (2IA-287).

2.3.6 Remove 2CV-1001 local air bleed off valve cap.

2.3.7 Open 2CV-1001 local air bleed off valve.

2.3.8 Open 2CV-1001 Upstream Isolation MOV (2CV-1002).

CAUTION

- ADV will open rapidly as hydraulic fluid is ported to release the diaphragm when Handle Position Selector is placed in OPER.
- Selecting OPER should be momentary and intermittent to prevent excessive S/G depressurization and to allow S/G pressure to stabilize.

2.3.9 Perform the following steps as required:

A. IF desired to lower S/G A pressure
OR establish valve position,
THEN perform the following:

1. Place 2CV-1001 Handle Position Selector in OPER.

2. WHEN desired pressure in S/G A reached
OR a more open valve position,
THEN place 2CV-1001 Handle Position Selector in LOCK.

B. IF desired to raise S/G A pressure
OR establish a more closed valve position,
THEN perform the following:

1. Place 2CV-1001 Handle Position Selector in MAN.

2. Rotate 2CV-1001 valve handwheel clockwise to desired S/G pressure or valve position.

3. Place 2CV-1001 Handle Position Selector in LOCK.

2.4 Perform the following to restore S/G A Upstream Atmospheric Dump Valve (2CV-1001) to normal operation:

2.4.1 Close Upstream Isolation MOV (2CV-1002).

2.4.2 Close 2CV-1001 local air bleed off valve.

2.4.3 Install cap on 2CV-1001 local air bleed off valve.

2.4.4 Open IA to 2CV-1001 (2IA-287).

2.4.5 Verify 2CV-1001 Handle Position Selector in OPER.

2.4.6 Check 2CV-1001 fully closed.

2.4.7 Close the following valves:

- 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3005)
- 2PI-1007 and 2CV-1001 Header Drain Isolation (2MS-3006)

(Step 2.4 continued on next page)

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ______

SYSTEM/DUTY AREA: Instrument Air System

TASK: Respond to lowering Instrument Air pressure

JTA#: ANO2-AO-IA-OFFNORM-18

ALTERNATE PATH YES: X No: ______ TIME CRITICAL YES: ____ NO: X

KA VALUE RO: 2.9 SRO: 3.2 KA REFERENCE: 065 AA2.01

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: ______ OUTSIDE CR: X BOTH: ______

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: Simulate SIMULATOR: ______ LAB: ______

POSITION EVALUATED: RO: ______ SRO: ______

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ____ LAB: ____

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP 2203.021 Loss of IA AOP Rev. 17; OP 2104.024 IA System OPS Rev.49

EXAMINEE'S NAME: ______ LOGON ID: ______

EVALUATOR'S NAME: ______

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______ UNSATISFACTORY: ______

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ______ Stop Time ______ Total Time ______

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The plant is at full power
- Instrument Air header pressure has lowered from normal 100 psig to 79 psig
- The CRS has entered Loss of Instrument Air AOP 2203.021

TASK STANDARD:

Unit 2 IA header pressure has been restored to normal pressure by placing the standby IA filter in service.

TASK PERFORMANCE AIDS:

OP 2203.021 Rev 17 Step 7&8 and OP 2104.024 Instrument Air System OPS Rev.49 Section 14.1

EXAMINER NOTES:

Respond to lowering Instrument Air pressure. This is an Alternate Path JPM. The lowering IA header pressure is due to high DP across the in-service IA Filter 2F-173A . When performing step 8 of the IA AOP and checking the DP of the IA header pressure and receiver tanks pressure, the DP will be greater than 10 psid. Step 8 Contingency Actions A and B will fail to lower the IA to receiver tanks DP thus per Contingency Action Step 8.C, a transition will be made to OP 2104.024, IA System OPS, and the standby IA Filter will be placed in service which will restore header pressure back to normal. The Loss of IA AOP procedure Step 7 and 8 should be handed out first. When examinee, gets to Contingency Action Step 8.C, then provide Section 14.1 of the IA System Operating Procedure OP-2104.024.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs, perform Loss of IA AOP starting at step 8.

START TIME: ______________

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5"><u>EXAMINER'S NOTES:</u>
1. When performing step 8 of the IA AOP and checking the DP of the IA header pressure and receiver tanks pressure, the DP will be greater than 10 psid thus the contingency actions apply.
2. Step 8 Contingency Actions A and B will fail to lower the IA to receiver tanks DP.
3. Therefore IAW Contingency Action Step C, a transition will be made to OP 2104.024, IA System OPS, and the standby IA Filter will be placed in service.</td></tr>
<tr><td colspan="5">PROCEDURE NOTE:
Symptoms checked by the following two steps may be masked with IA cross-connected. Consider closing IA cross-connect valves.
EXAMINER NOTE: If Control Room contacted concerning the above note, inform the examinee that it was considered but the IA is still cross connected with Unit 1.</td></tr>
<tr><td></td><td>1.
(Step 8.)</td><td>Locally CHECK BOTH IA receivers pressure greater than 85 psig.

"2T88A PRESS IND" 2PI-3033

"2T88B PRESS IND" 2PI-3019

<u>Examiner Cue:</u>

Both IA receivers are reading 100 psig pressure.</td><td>Checked IA pressure readings on both IA receivers by reading 2PI-3033 and 2PI-3019.</td><td>N/A SAT UNSAT</td></tr>
<tr><td></td><td>2.
(Step 9.)</td><td>Locally CHECK IA header pressure and air receivers pressure within 10 psid.

"IA MAIN SUPPLY HEADER" (2PIT-3013)

"2T88A PRESS IND" 2PI-3033

"2T88B PRESS IND" 2PI-3019

<u>Examiner Cue:</u>

IA Main Supply Header Pressure is reading 79 psig. Receivers are still at 100 psig.</td><td>Checked IA Main Supply Header pressure on 2PIT-3013 and receiver pressures on 2PI-3033 and 2PI-3019.

Determined that the DP from the receivers to the IA Main Header supply is greater than 10 psid.

(100psig – 79 psig = 21 psid)

Determined that the Contingency Actions of 2203.001 Step are applicable.</td><td>N/A SAT UNSAT</td></tr>
</table>

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	3. (Step CA 9/9.A.)	**IF** IA header and receivers pressure greater than 10 psid, **THEN** locally **PERFORM** the following as necessary: **OPEN** "COALESCING PREFILTER BYPASS" valve (2IA-186C). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-186C.** **Examiner Cue:** **IA Main Supply Header Pressure is reading 79 psig. Receivers are still at 100 psig.**	Locally opened "COALESCING PREFILTER BYPASS" valve 2IA-186C by turning valve handle counter clockwise until resistance is felt. Re-checked IA Main Supply Header pressure on 2PIT-3013 and receiver pressures on 2PI-3033 and 2PI-3019.	N/A SAT UNSAT
	4. (Step CA 8.B.)	**OPEN** "AIR DRYER BYPASS" valve (2IA-8). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-8.** **Examiner Cue:** **IA Main Supply Header Pressure is reading 79 psig. Receivers are still at 100 psig.**	Locally opened “AIR DRYER BYPASS" valve 2IA-8 by turning valve handle counter clockwise until resistance is felt. Re-checked IA Main Supply Header pressure on 2PIT-3013 and receiver pressures on 2PI-3033 and 2PI-3019.	N/A SAT UNSAT
	5. (Step CA 8.C)	**WHEN** time allows, **THEN PLACE** standby IA Dryer in service (refer to 2104.024, Instrument Air System).	Applicant determines there is not currently enough time to place the standby dryer in service.	N/A SAT UNSAT

EXAMINER’S NOTE: The following steps are the Alternate Path portion of this JPM.

EXAMINER NOTE: After examinee has determined the need to swap IA filters, provide a copy of OP 2104.024 Section 14.1.

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	5. (Step CA 9.D.)	**PLACE** standby IA Filter in service, refer to 2104.024, Instrument Air System. **Examiner Note:** **The applicant should determine which IA filter is in service at the plant and simulate shifting IA filters.** **Examiner Cue:** **If asked which IA filter is in service state it is as seen.**	Examinee transitioned to normal operating procedure 2104.024, Instrument Air System to place the standby IA Filter in service.	N/A SAT UNSAT
EXAMINER NOTE: The following steps are from OP 2104.024 Section 14.1.1 for placing 2F-173B in service. If the plant alignment has 2F-173B already in service then NA these step and use the steps to place 2F-173A in service on the next page.				
(C)	6. (Step 14.1.1. A.)	IF Instrument Air filter (2F-173A) in service, THEN place 2F-173B in service by performing the following: Open Air Filter 2F-173B Inlet (2IA-9B). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-9B.**	Locally opened “Air Filter 2F-173B Inlet valve 2IA-9B by turning valve handle counter clockwise until resistance is felt.	N/A SAT UNSAT
	7. (Step 14.1.1. B.)	Install locking device on 2IA-9B. **Examiner Cue:** **Locking Device is installed on 2IA-9B.**	Installed locking device on 2IA-9B	N/A SAT UNSAT
(C)	8. (Step 14.1.1. C.)	Open Air Filter 2F-173B Outlet (2IA-10B). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-10B.** **Examiner Cue:** **IA Main Supply Header pressure is reading 100 psig. Receivers are still at 100 psig.**	Locally opened “Air Filter 2F-173B Outlet valve 2IA-10B by turning valve handle counter clockwise until resistance is felt. Re-checked IA Main Supply Header pressure on 2PIT-3013 and receiver pressures on 2PI-3033 and 2PI-3019.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	9. (Step 14.1.1. D.)	Install locking device on 2IA-10B. **Examiner Cue:** **Locking Device is installed on 2IA-10B.**	Installed locking device on 2IA-10B.	N/A SAT UNSAT
	10. (Step 14.1.1. E.)	Remove locking device from Air Filter 2F-173A Inlet (2IA-9A) **Examiner Cue:** **Locking Device is removed from 2IA-9A.**	Removed locking device from Air Filter 2F-173A Inlet 2IA-9A.	N/A SAT UNSAT
(C)	11. (Step 14.1.1. F.)	Close Air Filter 2F-173A Inlet (2IA-9A). **Examiner Cue:** **Resistance is felt and valve handle perpendicular with pipe for 2IA-9A.**	Locally Closed Air Filter 2F-173A Inlet 2IA-9A by turning valve handle clockwise until resistance is felt.	N/A SAT UNSAT
	12. (Step 14.1.1. G.)	Remove locking device from Air Filter 2F-173A Outlet (2IA-10A). **Examiner Cue:** **Locking Device is removed from 2IA-10A.**	Removed locking device from Air Filter 2F-173A Outlet 2IA-10A.	N/A SAT UNSAT
(C)	13. (Step 14.1.1. H.)	Close Air Filter 2F-173A Outlet (2IA-10A). **Examiner Cue:** **Resistance is felt and valve handle perpendicular with pipe for 2IA-10A.**	Locally Closed Air Filter 2F-173A Inlet 2IA-10A by turning valve handle clockwise until resistance is felt.	N/A SAT UNSAT
	14. (Step 14.1.1.I)	IF 2F-173A isolated due to high DP, THEN initiate WR/WO to change 2F-173A. **Examiner Cue:** **State another operator will initiate the Work Request/ Work Order.**	Initiated action to change out 2F-173A	N/A SAT UNSAT

EXAMINER NOTE: The following steps are from OP 2104.024 Section 14.1.2 for placing 2F-173A in service. If the plant alignment has 2F-173A already in service then NA these step and use the steps to place 2F-173A in service on the previous page.

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	15. (Step 14.1.2. A.)	IF Instrument Air filter (2F-173B) in service, THEN place 2F-173A in service by performing the following: Open Air Filter 2F-173A Inlet (2IA-9A). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-9A.**	Locally opened "Air Filter 2F-173A Inlet valve 2IA-9A by turning valve handle counter clockwise until resistance is felt.	N/A SAT UNSAT
	16. (Step 14.1.2. B.)	Install locking device on 2IA-9A. **Examiner Cue:** **Locking Device is installed on 2IA-9A.**	Installed locking device on 2IA-9A	N/A SAT UNSAT
(C)	17. (Step 14.1.2. C.)	Open Air Filter 2F-173A Outlet (2IA-10A). **Examiner Cue:** **Resistance is felt and valve handle in line with pipe for 2IA-10A.** **Examiner Cue:** **IA Main Supply Header pressure is reading 100 psig. Receivers are still at 100 psig.**	Locally opened "Air Filter 2F-173A Outlet valve 2IA-10A by turning valve handle counter clockwise until resistance is felt. Re-checked IA Main Supply Header pressure on 2PIT-3013 and receiver pressures on 2PI-3033 and 2PI-3019.	N/A SAT UNSAT
	18. (Step 14.1.2. D.)	Install locking device on 2IA-10A. **Examiner Cue:** **Locking Device is installed on 2IA-10A.**	Installed locking device on 2IA-10A.	N/A SAT UNSAT
	19. (Step 14.1.2. E.)	Remove locking device from Air Filter 2F-173A Inlet (2IA-9B) **Examiner Cue:** **Locking Device is removed from 2IA-9B.**	Removed locking device from Air Filter 2F-173B Inlet 2IA-9B.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	20. (Step 14.1.2. F.)	Close Air Filter 2F-173B Inlet (2IA-9B). **Examiner Cue:** **Resistance is felt and valve handle perpendicular with pipe for 2IA-9B.**	Locally Closed Air Filter 2F-173B Inlet 2IA-9B by turning valve handle clockwise until resistance is felt.	N/A SAT UNSAT
	21. (Step 14.1.2. G.)	Remove locking device from Air Filter 2F-173B Outlet (2IA-10B). **Examiner Cue:** **Locking Device is removed from 2IA-10B.**	Removed locking device from Air Filter 2F-173B Outlet 2IA-10B.	N/A SAT UNSAT
(C)	22. (Step 14.1.2. H.)	Close Air Filter 2F-173B Outlet (2IA-10B). **Examiner Cue:** **Resistance is felt and valve handle perpendicular with pipe for 2IA-10B.**	Locally Closed Air Filter 2F-173B Inlet 2IA-10B by turning valve handle clockwise until resistance is felt.	N/A SAT UNSAT
	23. (Step 14.1.2.I .)	IF 2F-173B isolated due to high DP, THEN initiate WR/WO to change 2F-173B. **Examiner Cue:** **State another operator will initiate the Work Request/ Work Order.**	Initiated action to change out 2F-173B	N/A SAT UNSAT

STOP TIME: ________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- The plant is at full power
- Instrument Air header pressure has lowered from normal 100 psig to 79 psig
- The CRS has entered Loss of Instrument Air AOP 2203.021

INITIATING CUE:

The SM/CRS directs, perform Loss of IA AOP starting at step 8.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- The plant is at full power
- Instrument Air header pressure has lowered from normal 100 psig to 79 psig
- The CRS has entered Loss of Instrument Air AOP 2203.021.

INITIATING CUE:

The SM/CRS directs, perform Loss of IA AOP starting at step 8.

INSTRUCTIONS	CONTINGENCY ACTIONS

NOTE

Symptoms checked by the following TWO steps may be masked with IA cross-connected. Consider closing IA cross-connect valves.

8. Locally **CHECK** BOTH IA receivers pressure greater than 85 psig.
   - "2T88A PRESS IND" 2PI-3033
   - "2T88B PRESS IND" 2PI-3019

   Contingency 8. **IF** IA receivers pressure less than 85 psig, **THEN** **ENSURE** BOTH IA compressors running (refer to 2104.024, Instrument Air System).

9. Locally **CHECK** IA header pressure and air receivers pressure within 10 psid.
   - "IA MAIN SUPPLY HEADER" (2PIT-3013)
   - "2T88A PRESS IND" 2PI-3033
   - "2T88B PRESS IND" 2PI-3019

   Contingency 9. **IF** IA header and receivers pressure greater than 10 psid, **THEN** locally **PERFORM** the following as necessary:

   A. **OPEN** "COALESCING PREFILTER BYPASS" valve (2IA-186C).

   B. **OPEN** "AIR DRYER BYPASS" valve (2IA-8).

   C. **WHEN** time allows, **THEN** **PLACE** standby IA Dryer in service (refer to 2104.024, Instrument Air System).

   D. **PLACE** standby IA Filter in service, refer to 2104.024, Instrument Air System.

NOTE

Attachment B aligns critical components to their “fail safe” position to prevent inadvertent repositioning as IA pressure restores.

■ 10. **IF** AOVs have repositioned or are repositioning due to degraded IA pressure, **THEN** **PERFORM** Attachment B, Valve Switch Safe Positions, as required to prevent inadvertent repositioning.

14.0 INSTRUMENT AIR FILTER OPERATION

14.1 Shifting Unit 2 Instrument Air filters (2F-173A and 2F-173B)

14.1.1 IF Instrument Air filter (2F-173A) in service, THEN place 2F-173B in service by performing the following:

A. Open Air Filter 2F-173B Inlet (2IA-9B).

B. Install locking device on 2IA-9B.

C. Open Air Filter 2F-173B Outlet (2IA-10B).

D. Install locking device on 2IA-10B.

E. Remove locking device from Air Filter 2F-173A Inlet (2IA-9A).

F. Close Air Filter 2F-173A Inlet (2IA-9A).

G. Remove locking device from Air Filter 2F-173A Outlet (2IA-10A).

H. Close Air Filter 2F-173A Outlet (2IA-10A).

I. IF 2F-173A isolated due to high DP, THEN initiate WR/WO to change 2F-173A.

14.1.2 IF Instrument Air filter (2F-173B) in service, THEN place 2F-173A in service by performing the following:

A. Open Air Filter 2F-173A Inlet (2IA-9A).

B. Install locking device on 2IA-9A.

C. Open Air Filter 2F-173A Outlet (2IA-10A).

D. Install locking device on 2IA-10A.

E. Remove locking device from Air Filter 2F-173B Inlet (2IA-9B).

F. Close Air Filter 2F-173B Inlet (2IA-9B).

G. Remove locking device from Air Filter 2F-173B Outlet (2IA-10B).

H. Close Air Filter 2F-173B Outlet (2IA-10B).

I. IF 2F-173B isolated due to high DP, THEN initiate WR/WO to change 2F-173B.

(Step 14.0 continued on next page)

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ____________

SYSTEM/DUTY AREA: Liquid Radwaste and Boron Management System

TASK: Perform a release of 2T-69A Boric Acid Condensate Tank

JTA#: ANO2-WCO-LRWBMS-NORM-2

ALTERNATE PATH YES: ____ NO: X TIME CRITICAL YES: ____ NO: X

KA VALUE RO: 3.2 SRO: 3.1 KA REFERENCE: 068 A4.02

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: ____ OUTSIDE CR: X BOTH: ____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: Simulate SIMULATOR: ____ LAB: ____

POSITION EVALUATED: RO: ____ SRO: ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ LAB: ____

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): OP-2104.014 LRW and BMS Operations Sup. 3

EXAMINEE'S NAME: ____________ LOGON ID: ____________

EVALUATOR'S NAME: ____________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ UNSATISFACTORY: ____

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ____ Stop Time ____ Total Time ____

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

JPM INITIAL TASK CONDITIONS:

- 2T-69A Boric Acid Condensate Tank level is 90%.
- 2104.014 Sup. 1 Liquid Radwaste Release permit for 2T-69A has been submitted and completed.
- 2P-47A Boric Acid Condensate pump is running.
- 2RE-2330 radiation monitor is OPERABLE.
- Maximum flow rate from Pre-Release report based on number of Circ pumps running is 250 gpm.
- 2CV-2330A and 2CV-2330B were both tested in Supplement 1 of 2104.014.

TASK STANDARD:

A 2T-69A Boric Acid Condensate Tank release has been commenced using OP-2104.014 Sup. 3

TASK PERFORMANCE AIDS:

OP-2104.014 Sup. 3

EXAMINER NOTES:

Perform a release of 2T-69A Boric Acid Condensate Tank. The applicant will commence the release of 2T-69A by verifying that the pump 2P-47A is running then remove the red tag from the discharge isolation valve 2CV-2318 and opening the valve. The applicant will then align the automatic dump isolation valves 2CV-2330A and 2CV-2330B to OPEN. Next a manual isolation will be opened to commence the release. The applicant will then commence throttling the 2P-47A pump recirc isolation to achieve the desired release rate.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs, "Commence a 2T-69A Boric Acid Condensate Tank release using OP-2104.014 Supplement 3 starting at Step 3.1."

START TIME: _____________

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
TRANSITION NOTE: Proceed to the 335 elevation of the Aux Bldg by the WCO desk.				
Examiner Note: **The Red magnetic tags discuss in the JPM are stored on the panel 2C-112/2C-113 and can be referred to during the performance of this JPM.**				
	1. (Step 3.0/3.1)	IF releasing Boric Acid Condensate tank (2T-69A), THEN perform the following: Check the following valve closed AND magnetic tag on hand switch: 2T-69A Inlet 2CV-2312 (2HS-2312) **Examiner's Cue:** **2CV-2312 indicates Red light off, green light on.** **Red "CLOSED" magnetic tag is installed on 2HS-2312.** **If observed locally, 2CV-2312 Valve stem is fully down.**	Observed red "CLOSED" magnetic tag installed on 2HS-2312. **AND EITHER:** At 2C-112 panel, observed red light off, green light on for 2CV-2312. **OR** Locally, observed valve stem fully down.	N/A SAT UNSAT
	2. (Step 3.1)	Check the following valve closed AND magnetic tag on hand switch: 2P-47A Discharge 2CV-2318 (2HS-2318) **Examiner's Cue:** **2CV-2318 Red light off, green light on.** **Red "CLOSED" magnetic tag is installed on 2HS-2318.** **If observed locally, 2CV-2318 Valve stem is fully down.**	Observed red "CLOSED" magnetic tag installed on 2HS-2318. **AND EITHER:** At 2C-112 panel, observed red light off, green light on for 2CV-2318. **OR** Locally, observed valve stem fully down.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
EXAMINERS NOTE: Step 3.2 is not applicable due to using 2P- 47A and Step 4 is not applicable due to releasing 2T-69A				
	3. (Step 5.0)	IF any magnetic tag NOT on hand switch, THEN do NOT perform this release and submit new release permit (Supplement 1).	Observed that the required magnetic tag are on the proper handswitches 2HS-2312 and 2HS-2318	N/A SAT UNSAT
	4. (Step 6.0)	Verify selected Boric Acid Condensate pump running: 2P-47A (2HS-2316) **Examiner's Cue:** **2P-47A Red light on, green light off.** **OR** **2PI-2317 indicates 65 psig.**	Either: At 2C-112 panel, observed red light on, green light off for 2P-47A (2HS-2316). **OR** At 2C-112 panel, observed pressure on 2PI-2317.	N/A SAT UNSAT
	5. (Step 7.0/7.1)	Perform the following to commence releasing selected 2T-69: Remove magnetic tag from selected Boric Acid Condensate Pump Discharge: 2P-47A Disch 2CV-2318 (2HS-2318) **Examiner's Cue:** **Red "CLOSED" magnetic tag is removed from 2HS-2318.**	Removed red "CLOSED" magnetic tag from 2HS-2318 for 2P-47A Discharge.	N/A SAT UNSAT
(C)	6. (Step 7.2)	Open selected Boric Acid Condensate Pump Discharge valve: 2P-47A Disch 2CV-2318 (2HS-2318) **Examiner's Cue:** **2CV-2318 Red light on, green light off.**	At 2C-112 panel, placed 2HS-2318 to OPEN. Observed Red light ON, green light Off for 2CV-2318	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	7. (Step 7.3)	Place “Open-Dump” magnetic tag near selected Boric Acid Condensate Pump Discharge valve: 2P-47A Disch (2CV-2318) **Examiner’s Cue:** **Red “OPEN-DUMP” magnetic tag is near 2HS-2318.**	Placed red “OPEN-DUMP” magnetic tag near handswitch 2HS-2318 for 2CV-2318.	N/A SAT UNSAT
(C)	8. (Step 8.0/8.1)	Verify the following (N/A valve if not opened): IF BMS Liquid Discharge Rad Monitor (2RITS-2330) functional, THEN verify valves tested in Supplement 1 open: 2CV-2330A 2CV-2330B **Examiner’s Cue:** **2HS-2330 is position 1 or 3. Red light on, green light off for 2CV-2330A and 2CV-2330B.**	At 2C-112 panel, placed 2HS-2330 in position “1” or “3” and verified Red light is illuminated for 2CV-2330A and 2CV-2330B.	N/A SAT UNSAT
EXAMINERS NOTE: **Step 8.2 is not applicable due to the BMS Liquid Discharge Rad Monitor (2RITS-2330) is operable.**				
	9. (Step 9.0)	Verify flow on BMS Liquid Discharge recorder (2FR/RR-2331) ~ 0 gpm **Examiner’s Cue:** **Control room states, “2FR/RR-2331 recorder indicates 0 gpm.”**	Contacted the Control room by radio or phone to verify no flow exists on 2FR/RR-2331.	N/A SAT UNSAT
TRANSITION NOTE:				

JOB PERFORMANCE MEASURE

<table>
<tr><th colspan="3">PERFORMANCE CHECKLIST</th><th>STANDARDS</th><th>(Circle One)</th></tr>
<tr><td colspan="5">Proceed to the 326 elevation area by the Squeeze valve.</td></tr>
<tr><td>(C)</td><td>10.
(Step 10.0)</td><td>Open 2P-47A/B Discharge to Circ Water Flume (2BM-35).

<u>Examiner's Cue:</u>
2BM-35 Valve stem is fully extended.</td><td>Opened Circ Water Flume 2BM-35 by turning handwheel CCW until resistance felt and valve stem is fully extended.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5"><u>PROCEDURE NOTE</u>
Recirc valves should be maintained at least one turn open to ensure minimum recirc flow if 2CV-2330A/B close.
Boric Acid Condensate Pump Discharge flow can be established using indication 2FIC-2330 on 2C-112 / 2FR/RR-2331 on 2C14 or F2330 on PMS2.</td></tr>
<tr><td>(C)</td><td>11.
(Step 11.0)</td><td>Throttle selected Boric Acid Condensate Pump Recirc 2BM-80A as needed to establish flow within the following limits using indications in above Note:

≤ 75 gpm (Liquid Waste Discharge 2FIC-2330 range).

<u>Examiner's Cue:</u>
Flow noise is heard.
Flow is 60 gpm
Recirc valve is one turn open.</td><td>Throttled 2BM-80A by turning handwheel CW until indicated flow on 2FIC-2330 on 2C112 is 60 gpm.
Ensured Recirc Valve 2BM-80A is left opened ~ 1 turn to ensure minimum recirc flow if the release is terminated.</td><td>N/A SAT UNSAT</td></tr>
<tr><td colspan="5">END</td></tr>
</table>

STOP TIME: ______________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

- 2T-69A Boric Acid Condensate Tank level is 90%.
- 2104.014 Sup. 1 Liquid Radwaste Release permit for 2T-69A has been submitted and completed.
- 2P-47A Boric Acid Condensate pump is running.
- 2RE-2330 radiation monitor is OPERABLE.
- Maximum flow rate from Pre-Release report based on number of Circ pumps running is 250 gpm.
- 2CV-2330A and 2CV-2330B were both tested in Supplement 1 of 2104.014.

INITIATING CUE:

The SM/CRS directs, "Commence a 2T-69A Boric Acid Condensate Tank release using OP-2104.014 Supplement 3 starting at Step 3.1."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- 2T-69A Boric Acid Condensate Tank level is 90%.
- 2104.014 Sup. 1 Liquid Radwaste Release permit for 2T-69A has been submitted and completed.
- 2P-47A Boric Acid Condensate pump is running.
- 2RE-2330 radiation monitor is OPERABLE.
- Maximum flow rate from Pre-Release report based on number of Circ pumps running is 250 gpm.
- 2CV-2330A and 2CV-2330B were both tested in Supplement 1 of 2104.014.

INITIATING CUE:

The SM/CRS directs, "Commence a 2T-69A Boric Acid Condensate Tank release using OP-2104.014 Supplement 3 starting at Step 3.1."

SUPPLEMENT 3

BORIC ACID CONDENSATE TANK (2T-69A/B) RELEASE

N/A ~~1.0~~ IF BMS Liquid Discharge Rad Monitor (2RITS-2330) non-functional, THEN perform the following to implement ODCM L2.1.1 action 1:

1.1 Verify at least two independent samples of tank to be released have been analyzed.

1.2 Verify release rate computer input data independently verified by at least two technically qualified members of Facility Staff.

1.3 Verify discharge valve lineup independently verified by at least two technically qualified members of Facility Staff.

* 2.0 IF Unit 1 Circ water flow adjusted during this release, THEN terminate release.

3.0 IF releasing Boric Acid Condensate tank (2T-69A), THEN perform the following:

3.1 Check the following valves closed AND magnetic tag on hand switch:

	Valve Closed	Tag on HS
• 2T-69A Inlet 2CV-2312 (2HS-2312)	________	________
• 2P-47A Discharge 2CV-2318 (2HS-2318)	________	________

3.2 IF using 2P-47B to pump 2T-69A, THEN check the following:

- 2P-47B Discharge (2CV-2326) closed.
- Magnetic tag on hand switch 2HS-2326.

4.0 IF releasing Boric Acid Condensate tank (2T-69B), THEN perform the following:

4.1 Check the following valves closed AND magnetic tag on hand switch:

	Valve Closed	Tag on HS
• 2T-69B Inlet 2CV-2320 (2HS-2320)	________	________
• 2P-47B Discharge 2CV-2326 (2HS-2326)	________	________

4.2 IF using 2P-47A to pump 2T-69B, THEN check the following:

- 2P-47A Discharge (2CV-2318) closed.
- Magnetic tag on hand switch 2HS-2318.

5.0 IF any magnetic tag NOT on hand switch,
THEN do NOT perform this release and submit new release permit (Supplement 1).

6.0 Verify selected Boric Acid Condensate pump running:

- 2P-47A (2HS-2316)
- 2P-47B (2HS-2324)

7.0 Perform the following to commence releasing selected 2T-69:

7.1 Remove magnetic tag from selected Boric Acid Condensate Pump Discharge:

- 2P-47A Disch 2CV-2318 (2HS-2318)
- 2P-47B Disch 2CV-2326 (2HS-2326)

7.2 Open selected Boric Acid Condensate Pump Discharge valve:

- 2P-47A Disch 2CV-2318 (2HS-2318)
- 2P-47B Disch 2CV-2326 (2HS-2326)

7.3 Place “Open-Dump” magnetic tag near selected Boric Acid Condensate Pump Discharge valve:

- 2P-47A Disch (2CV-2318)
- 2P-47B Disch (2CV-2326)

8.0 Verify the following (N/A valve if not opened):

8.1 IF BMS Liquid Discharge Rad Monitor (2RITS-2330) functional, THEN verify valves tested in Supplement 1 open:

- 2CV-2330A
- 2CV-2330B

8.2 IF BMS Liquid Discharge Rad Monitor (2RITS-2330) NOT functional, THEN open selected LRW/BMS Discharge to Circ Water Flume valves (EITHER or BOTH) as follows:

8.2.1 Verify Liquid Waste Disch (2FIC-2330) in MANUAL with output demand 100 %.

8.2.2 IF desired to open BOTH 2CV-2330A and 2CV-2330B, THEN verify the following:

A. (2HS-2331) in position BOTH

B. (2HS-2330) in position 1 OR 3

8.2.3 IF desired to open EITHER 2CV-2330A or 2CV-2330B, THEN verify the following:

A. (2HS-2331) in position ONE.

B. IF desired to open 2CV-2330A, THEN verify (2HS-2330) in position 1.

C. IF desired to open 2CV-2330B, THEN verify (2HS-2330) in position 3.

D. IF EITHER valve unavailable, THEN locally verify unavailable valve failed in closed position.

9.0 Verify flow on BMS Liquid Discharge recorder (2FR/RR-2331) ~ 0 gpm.

10.0 Open 2P-47A/B Discharge to Circ Water Flume (2BM-35).

NOTE

- Recirc valves should be maintained at least one turn open to ensure minimum recirc flow if 2CV-2330A/B close.
- Boric Acid Condensate Pump Discharge flow can be established using indication 2FIC-2330 on 2C-112 / 2FR/RR-2331 on 2C14 or F2330 on PMS2.

11.0 Throttle selected Boric Acid Condensate Pump Recirc (2BM-80A or 2BM-80B) as neceded to establish flow within the following limits using indications in above Note:

- ≤ ______ gpm (max flow rate from Pre-Release report based on number of Circ pumps running).
- ≤ 75 gpm (Liquid Waste Discharge 2FIC-2330 range).

12.0 IF Liquid Discharge Discharge (2FIC-2330) non-functional, THEN perform the following:

12.1 Estimate pump flow using Attachment G at least once every four hours.

12.2 Document in Station Log.

13.0 IF BMS Liquid Discharge Rad Monitor (2RITS-2330) non-functional, THEN Independently Verify the following:

13.1 Selected Boric Acid Condensate Tank Inlet closed AND magnetic tag on hand switch:

	Valve Closed	Tag on HS
• 2T-69A Inlet 2CV-2312 (2HS-2312	________	________
• 2T-69B Inlet 2CV-2320 (2HS-2320)	________	________

13.2 Selected Boric Acid Condensate Pump Discharge valve open:

- 2P-47A Disch 2CV-2318 (2HS-2318)
- 2P-47B Disch 2CV-2326 (2HS-2326)

13.3 One or both Discharge to Circ Water Flume valves (2CV-2330A/B) open IAW step 8.0.

13.4 2P-47A/B Discharge to Circ Water Flume (2BM-35) open.

13.5 Flow within limits of step 11.0.

IV performed by: ______________________________

JOB PERFORMANCE MEASURE

Unit: 2 **Rev #:** 0 **Date:** ____

System/Duty Area: Emergency Diesel Generator

Task: Energize 2A-4 bus during LOOP

JTA# ANO2-RO-EOPAOP-EMERG-32

Alternate Path Yes: X No: ____ **Time Critical** Yes: ____ No: X

KA Value RO: 3.3 SRO: 3.1 **KA Reference:** 062 A4.01

Approved For Administration To: ____ ____ RO: X SRO: X

Task Location: Inside CR: X Outside CR: ____ Both: ____

Suggested Testing Environment And Method (Perform Or Simulate):

Plant Site: ____ **Simulator:** Perform **Lab:** ____

Position Evaluated: RO: ____ SRO: ____

Actual Testing Environment: Simulator: ____ Plant Site: ____ Lab: ____

Testing Method: Simulate: ____ Perform: ____

Approximate Completion Time In Minutes: 20 minutes

References(s): 2202.007 Loss of Offsite Power EOP

Examinee's Name: ____ **LOGON ID:** ____

Evaluator's Name: ____

The Examinee's performance was evaluated against the standards contained in this JPM and is determined to be:

Satisfactory: ____ **Unsatisfactory:** ____

Performance Checklist Comments:

____

____

Start Time: ____ **Stop Time:** ____ **Total Time:** ____

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

JPM INITIAL TASK CONDITIONS:

- Mode 3
- LOOP in progress
- # 1 EDG supplying 2A-3
- LOOP EOP has been entered and completed through step 6.

SIMULATOR SETUP:

* Unit off line, Mode 3.
* Start # 2 EDG,
* Insert remote LCK_OP for 2A-408
* Insert malfunctions for LOOP, LOSE161 & LOSE500

TASK STANDARD:

Energize 2A-4 4160 volt bus from the Alternate AC Diesel Generator.

TASK PERFORMANCE AIDS:

2202.007, LOOP EOP

EXAMINER'S NOTE:

Energize 2A-4 bus during LOOP. This is an Alternate Path JPM. During a LOOP, when the applicant goes to verify 2DG2 output breaker is closed, it will not be closed and attempts to close the breaker fail. This will result in securing 2DG2 and energizing the 2A-4 4160 Volt Vital bus with the Alternate AC Diesel Generator. The LOOP EOP Procedure OP 2202.007 should be used first. When the applicant has completed JPM step 8 to LOCKOUT 2DG2 (Red Train Diesel), then the applicant will transition to Attachment E of OP 2104.037, Alternate AC Diesel Operations and start the AACG and energize the 2A-4 4160 Volt Vital bus.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, "Perform actions required by OP-2202.007, LOOP EOP, starting at step 7, and verify both 4160 volt ESF busses energized."

START TIME: ____________________

		CHECKLISTS	STANDARDS	(Circle One)
	1. (Step 7.A)	Evaluate operation of DGs as follows: Check BOTH DGs running.	On Panel 2C-33, checked both EDGs running.	N/A SAT UNSAT
	2. (Step 7.B)	Check running DG output breakers closed.	On Panel 2C-33, checked 2A-308 Closed for # 1 EDG, Red light on and 2A-3 bus energized. On Panel 2C-33, checked 2A-408 status and noted breaker indicates Open by seeing Green light on and Red light off and 2A-4 indicates no voltage.	N/A SAT UNSAT
EXAMINER NOTE: The following steps are the alternate path steps as the #2 EDG Breaker 2A-408 indicates OPEN.				
	3. (Step 7.B CA 1)	Verify the following breakers open: • 2A409, "2A4 Supply Breaker" • 2A410, "2A3-2A4 Tie Breaker"	On Panel 2C-33, verified 2A-409 and 2A-410 Open by checking Green lights on and Red lights off.	N/A SAT UNSAT
	4. (Step 7.B CA 2)	Verify running DG voltage and frequency: • 4100 to 4200v • 59.5-60.5 Hz	On Panel 2C-33, verified #2 EDG voltage is between 4100 and 4200 volts. On Panel 2C-33, verified #2 EDG frequency is between 59.5 and 60.5 Hz.	N/A SAT UNSAT
	5. (Step 7.B CA 3.a)	IF NO 4160v Vital bus lockouts exist, THEN perform the following: Place running DG synch switch in ON position.	On Panel 2C-33, placed 2DG2 Synchronize Handswitch 152-408SS to ON position.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

		CHECKLISTS	STANDARDS	(Circle One)
EXAMINER NOTE: DG OUTPUT BREAKER WILL NOT CLOSE REMOTELY IN THE NEXT STEP				
	6. (Step 7.B CA 3.b)	Close running DG Output breaker.	On Panel 2C-33, placed 2DG2 output breaker, 2A-408 Handswitch 152-408CS to the CLOSE position and checks 2A-408 status and noted breaker still indicates open by seeing Green light on and Red light off and 2A-4 indicates no voltage.	N/A SAT UNSAT
EXAMINER NOTE: DG OUTPUT BREAKER WILL NOT CLOSE LOCALLY IN THE NEXT STEP				
	7. (Step 7.B CA 3.c)	IF DG Output breaker will NOT close from 2C33, THEN locally close running DG Output breaker: • 2A-408, "2DG 2 OUTPUT BREAKER" **<u>EXAMINER CUE:</u>** **An attempt was made to Locally Close the 2DG2 Output Breaker 2A-408 and the breaker did not close.**	Called and directed the IAO to go to 2DG2 and locally close 2DG2 Output Breaker 2A-408 using the Local Handswitch.	N/A SAT UNSAT
	8. (Step 7.B CA 4.a)	IF bus can NOT be energized from DG, THEN perform the following: Locally stop affected DG by unlocking and placing "ENGINE CONTROL" switch in LOCKOUT at respective cabinet: • 2E11/2E21 **<u>EXAMINER CUE:</u>** **The 2DG2 "ENGINE CONTROL" switch has been placed in LOCKOUT at cabinet 2E21.**	Called and directed the IAO to Locally stop 2DG2 by unlocking and placing "ENGINE CONTROL" switch in LOCKOUT at cabinet 2E21.	N/A SAT UNSAT
	9. (Step 7.B CA 4.b)	Start AACG AND align to associated 4160v Vital bus using 2104.037, Alternate AC Diesel Generator Operations, Attachment E.	Obtained a copy of 2104.037, Alternate AC Diesel Generator Operations, Attachment E and proceeded to start the AACG AND align to 4160v Vital Bus 2A-4.	N/A SAT UNSAT
EXAMINERS NOTE: The applicant will transition to using OP-2104.037, Alternate AC Diesel Generator Operations, Attachment E				
	10. (Step 1.0)	<u>IF</u> PLC-A available, <u>THEN</u> reset PLC using EITHER of the following: • AACG Annunciator Screen • Handswitch on 2C435.	Reset the PLC using the AACG Annunciator Screen on the AACG Control Console on Panel 2C-14	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

		CHECKLISTS	STANDARDS	(Circle One)
	11. (Step 2.0)	IF EITHER of AACG network PLC (PLC-A or PLC-C) failed, OR both PCs failed, THEN PERFORM a local start using Exhibit 1, AAC Generator Local Start and Stop.	The AACG network PLCs have not failed; therefore this step is not applicable (NA).	N/A SAT UNSAT
EXAMINER NOTE: The following steps will be performed to start the Alternate AC Generator (AACG).				
	12. (Step 3.1/ 3.2)	• Touch ELECTRICAL BUS CONTROL. • Touch 4160 V BREAKERS.	On the AACG control screen, touched ELECTRICAL BUS CONTROL button then touched 4160 V BREAKERS button.	N/A SAT UNSAT
	13. (Step 3.3)	ENSURE the following breakers open: • 2A901, AAC to 4.16KV Switchgear A3 • 2A902, AAC to 4.16KV Switchgear 2A4 • 2A903, AAC to 4.16KV Switchgear A1 • 2A904, AAC to 4.16KV Switchgear 2A1	On the AACG 4160 V BREAKER screen, verified the following breakers indicated OPEN by observing GREEN indication on the breakers on the AACG operating console: • 2A901, AAC to 4.16KV Switchgear A3 • 2A902, AAC to 4.16KV Switchgear 2A4 • 2A903, AAC to 4.16KV Switchgear A1 • 2A904, AAC to 4.16KV Switchgear 2A1	N/A SAT UNSAT
(C)	14. (Step 3.4/ 3.5)	• Touch ENGINE START/STOP. • Touch START SCREEN	On the AACG control screen, touched ENGINE START/STOP button then touched START SCREEN button.	N/A SAT UNSAT
(C)	15. (Step 3.6)	• Touch START button.	On the AACG START SCREEN, touched the START button and observed the AAC Generator accelerate to normal speed and voltage in less than 35 seconds.	N/A SAT UNSAT
	16. (Step 3.7)	IF engine does NOT start in ~ 35 seconds due to pre-lube interlock, THEN TOUCH and HOLD EMERGENCY START until engine speed reaches 180 RPM.	On the AACG START SCREEN observed the AAC Generator starts in less than 35 seconds; therefore, this step is not applicable (NA).	N/A SAT UNSAT
	17. (Step 3.8)	ENSURE the following generator parameters: • Generator frequency ~ 60 Hz (900 RPM) • Voltage ~ 4160 volts.	On the AACG START SCREEN, verified AACDG DG frequency ~ 60 Hz (900 RPM) and Verified AACDG voltage ~ 4160 volts.	N/A SAT UNSAT
EXAMINER NOTE: The following steps will be performed to ensure proper AAC Electrical System alignment				
	18. (Step 4.1/ 4.2)	• TOUCH ELECTRICAL BUS CONTROL. • TOUCH 4160V BREAKERS.	On the AACG control screen, touched ELECTRICAL BUS CONTROL button then touched 4160 V BREAKERS button.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

		CHECKLISTS	STANDARDS	(Circle One)
	19. (Step 4.3)	ENSURE AAC Generator Output breaker (2A-1001) closed.	ENSURED AAC Generator Output breaker (2A-1001) closed by observing RED indication on the breaker on the AACG operating console.	N/A SAT UNSAT
	20. (Step 4.4/ 4.5)	• TOUCH ELECTRICAL BUS CONTROL. • TOUCH 480V BREAKERS.	On the AACG control screen, touched ELECTRICAL BUS CONTROL button then touches 480V BREAKERS button.	N/A SAT UNSAT
	21. (Step 4.6)	ENSURE Offsite Main Breaker M1 (2B16-A1) open.	ENSURED Offsite Main Breaker M1 (2B16-A1) open by observing GREEN indication on the breaker on the AACG operating console.	N/A SAT UNSAT
	22. (Step 4.7)	ENSURE Generator Main Breaker M2 (2B16-B1) closed.	ENSURED Generator Main Breaker M2 (2B16-B1) closed by observing RED indication on the breaker on the AACG operating console.	N/A SAT UNSAT
	23. (Step 4.8/ 4.9)	• TOUCH MONITOR • TOUCH ANNUNCIATOR SCREEN	On the AACG control screen, touched MONITOR button then touched ANNUNCIATOR SCREEN button.	N/A SAT UNSAT
	24. (Step 4.10)	ENSURE the following alarms clear: • Loss of 480 VAC POWER • 120 VAC UPS TROUBLE	ENSURED the following alarms clear by observing none of the following flashing on the AACG operating console: • Loss of 480 VAC POWER • 120 VAC UPS TROUBLE	N/A SAT UNSAT
	25. (Step 5.0)	COORDINATE with Unit 1 to determine electrical power status. **<u>EXAMINER CUE:</u>** **Unit 1 is not using the Alternate AC Diesel for any electrical loads and does not plan to use the Alternate AC Diesel for the foreseeable future**	Contacted Unit 1 to determine if Unit 1 is using the Alternate AC Diesel for and electrical loads.	N/A SAT UNSAT
EXAMINER NOTE: The following steps will be performed to energize 2A4 from the AACG (Dead-bus Transfer only)				
	26. (Step 7.1)	IF powering Safety Related loads on BOTH Unit 1 and Unit 2, THEN ENSURE efforts are being pursued to restore normal offsite power or EDGs to minimize the vulnerability of total reliance upon the AACG by both units.	Unit 1 is not using the AACG for any electrical loads and do not plan to use the AACG for the foreseeable future; therefore this step is not applicable (NA).	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

		CHECKLISTS	STANDARDS	(Circle One)
	27. (Step 7.2)	ENSURE 2A3 - 2A4 Tie breaker (2A-410) open.	ENSURED 2A3 - 2A4 Tie breaker (2A-410) open by observing the Green flag on Handswitch 152-410 CS on 2C-33 with Green light on and Red light off above handswitch.	N/A SAT UNSAT
(C)	28. (Step 7.3)	ENSURE 2A4 Supply breaker (2A-409) in PULL-TO-LOCK.	Took the Supply breaker (2A-409) Handswitch 152-409 CS on 2C-33 to the "PULL-TO-LOCK" position.	N/A SAT UNSAT
(C)	29. (Step 7.4)	ENSURE 2DG2 Output breaker (2A-408) in PULL-TO-LOCK.	Took the 2DG2 Output breaker (2A-408) Handswitch 152-408 CS on 2C-33 to the "PULL-TO-LOCK" position.	N/A SAT UNSAT
	30 (Step 7.5/ 7.5.1)	IF 2A3 NOT energized from AAC Generator, THEN: ENSURE 2A3 - 2A4 Tie breaker (2A-310) open.	ENSURED 2A3 - 2A4 Tie breaker (2A-310) open by observing the Green flag on Handswitch 152-310 CS on 2C-33 with Green light on and Red light off above handswitch.	N/A SAT UNSAT
(C)	31. (Step 7.5.2)	IF PLC available, THEN: A. TOUCH ELECTRICAL BUS CONTROL. B. TOUCH 4160 V BREAKERS. C. TOUCH 2A-902.	On the AACG control screen, touched ELECTRICAL BUS CONTROL button then touched 4160 V BREAKERS button then touched 2A-902 button.	N/A SAT UNSAT
(C)	32. (Step 7.5.3)	PERFORM the following as needed to close 2A-902: • TOUCH CLOSE on PLC. • USE 2A-902 Control switch (2HS-7101). • Locally OPERATE 2A-902 using Exhibit 4, AAC Generator 4160 V Breaker Operation Without DC.	On the AACG 4160 V BREAKERS screen, Touched CLOSE button on 2A-902, AACG Supply Breaker, and verified AACG Supply Breaker 2A-902 closes by observing RED indication on the breaker on the AACG operating console. OR Closed 2A-902 using HS 2HS-7101	N/A SAT UNSAT
(C)	33. (Step 7.6)	CLOSE and HOLD 2A3 - 2A4 Tie (2A-410) in CLOSE position for 3 seconds.	Took the 2A3 - 2A4 Tie (2A-410) Breaker Handswitch 152-309 CS on 2C33 to the CLOSE position and held for 3 seconds and observed the 2A-410 Breaker closes by RED Flag on Handswitch and Red light on and Green light off above handswitch.	N/A SAT UNSAT
	34. (Step 7.7)	ENSURE 2A4 voltage indicates approximately 4160 volts.	ENSURED 2A4 is energized and voltage on meter ESFAS BUS V-2A4/1B on 2C33 (or SPDS) indicates approximately 4160 volts.	N/A SAT UNSAT
			END	

STOP TIME: ______________________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- LOOP in progress
- # 1 EDG supplying 2A-3
- LOOP EOP has been entered and completed through step 6.

INITIATING CUE:

The CRS directs, "Perform actions required by LOOP EOP starting at step 7, and verify both 4160 volt ESF busses energized."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- Mode 3
- LOOP in progress
- # 1 EDG supplying 2A-3
- LOOP EOP has been entered and completed through step 6.

INITIATING CUE:

The CRS directs, "Perform actions required by LOOP EOP starting at step 7, and verify both 4160 volt ESF busses energized."

LOSS OF OFFSITE POWER

CAUTION

Failure to use average CETs to monitor MTS with ALL RCPs stopped may result in misleading evaluation of core conditions.

***1. Confirm diagnosis of only a Loss of Offsite Power by checking SFSC acceptance criteria satisfied every 15 minutes.**	***1. Rediagnose event using 2202.010, Exhibit 8, Diagnostic Actions.**
***2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.**	
3. Open Placekeeping page.	
4. Notify Control Board Operators to perform the following: A. Monitor floating steps. B. Verify actuated ESFAS components using 2202.010 Exhibit 9, ESFAS Actuation.	
***5. Perform the following to protect Main Condenser:** A. Close MSIVs. B. Close SG Blowdown Isolation valves: • 2CV-1016-1 • 2CV-1066-1	

***6. Check SG pressure greater than 950 psia.**

***6. <u>IF</u> SG pressure less than 950 psia, <u>THEN</u> perform the following as necessary:**

A. Verify BOTH Upstream ADV Isolation valves closed:

- 2CV-1002
- 2CV-1052

B. Manually control EFW flow to SGs using 2202.010 Attachment 46, Establishing EFW Flow.

***7. Evaluate operation of DGs as follows:**

A. Check BOTH DGs running.

A. Perform the following:

1) <u>IF</u> EITHER DG <u>NOT</u> running, <u>THEN</u> perform the following:

a) Initiate corrective actions to return ANY inoperable DG to service using 2104.036, Emergency Diesel Generator Operations.

b) Initiate annunciator corrective actions for ANY alarms.

c) <u>WHEN</u> ANY inoperable DG returned to service, <u>THEN</u> **GO TO** Step 7.B for returned DG.

2) <u>IF</u> inoperable DG <u>NOT</u> returned to service, <u>THEN</u> start AACG AND align to associated 4160v Vital bus using 2104.037, Alternate AC Diesel Generator Operations, Attachment E.

(Step 7 continued on next page)

7. (continued)

B. Check running DG Output breakers closed.

B. Perform the following:

1) Verify the following breakers open:

- 2A309, “2A3 Supply Breaker”
- 2A310, “2A3-2A4 Tie Breaker”
- 2A409, “2A4 Supply Breaker”
- 2A410, “2A3-2A4 Tie Breaker”

2) Verify running DG voltage and frequency:

- 4100 to 4200v
- 59.5 to 60.5 Hz

3) IF NO 4160v Vital bus lockouts exist, THEN perform the following:

a) Place running DG synch switch in ON position.

b) Close running DG Output breaker.

c) IF DG Output breaker will NOT close from 2C33, THEN locally close running DG Output breaker:

- 2A308, "2DG 1 OUTPUT BREAKER"
- 2A408, "2DG 2 OUTPUT BREAKER"

(Step 7 continued on next page)

7. (continued)

4) IF bus can NOT be energized from DG, THEN perform the following:

   a) Locally stop affected DG by unlocking and placing "ENGINE CONTROL" switch in LOCKOUT at respective cabinet:

      - 2E11/2E21

   b) Start AACG AND align to associated 4160v Vital bus using 2104.037, Alternate AC Diesel Generator Operations, Attachment E.

C. Verify running DG voltage and frequency:

   - 4100 to 4200v
   - 59.5 to 60.5 Hz

D. Locally monitor DG operation.

E. IF desired to energize 4160v Non-vital bus 2A1, THEN start AACG AND align to associated 4160v Vital bus using 2104.037, Alternate AC Diesel Generator Operations, Attachment E.

ATTACHMENT E

AAC GENERATOR EMERGENCY START

1.0 **IF** PLC-A available,
THEN RESET PLC using EITHER of the following:

- ☐ AACG Annunciator Screen
- ☐ Handswitch on 2C435

NOTE

AACG can be started and tied to buses from either of the PCs (2C14 or 2C435) as long as both Network PLCs (PLC-A and PLC-C) are functional.

2.0 **IF** EITHER AACG network PLC (PLC-A or PLC-C) failed,
OR BOTH PCs failed,
THEN PERFORM a local start using Exhibit 1, AAC Generator Local Start and Stop.

3.0 **PERFORM** the following to start AAC Generator:

3.1 **TOUCH** ELECTRICAL BUS CONTROL.

3.2 **TOUCH** 4160 V BREAKERS.

3.3 **ENSURE** the following breakers open:

- ☐ 2A-901, AAC to 4.16KV Switchgear A3
- ☐ 2A-902, AAC to 4.16KV Switchgear 2A4
- ☐ 2A-903, AAC to 4.16KV Switchgear A1
- ☐ 2A-904, AAC to 4.16KV Switchgear 2A1

3.4 **TOUCH** ENGINE START/STOP.

3.5 **TOUCH** START SCREEN.

3.6 **TOUCH** START button.

3.7 **IF** engine does **NOT** start in 35 seconds due to pre-lube interlock,
THEN TOUCH and **HOLD** EMERGENCY START until engine speed is 180 RPM.

3.8 **ENSURE** the following generator parameters:

- ☐ Frequency approximately 60 Hz (900 RPM)
- ☐ Voltage approximately 4160 volts

ATTACHMENT E

4.0 **PERFORM** the following to ensure proper AAC Electrical System alignment:

4.1 **TOUCH** ELECTRICAL BUS CONTROL.

4.2 **TOUCH** 4160V BREAKERS.

4.3 **ENSURE** AAC Generator Output breaker (2A-1001) closed.

4.4 **TOUCH** ELECTRICAL BUS CONTROL.

4.5 **TOUCH** 480V BREAKERS.

4.6 **ENSURE** Offsite Main Breaker M1 (2B16-A1) open.

4.7 **ENSURE** Generator Main Breaker M2 (2B16-B1) closed.

4.8 **TOUCH** MONITOR

4.9 **TOUCH** ANNUNCIATOR SCREEN

4.10 **ENSURE** the following alarms clear:

- ☐ Loss of 480 VAC POWER
- ☐ 120 VAC UPS TROUBLE

5.0 **COORDINATE** with Unit 1 to determine electrical power status.

ATTACHMENT E

NOTE

2A3 and 2A4 should not be supplied at the same time in Modes 1-4 except to satisfy a safety function.

6.0 **IF** desired to energize 2A3 from the AACG (Dead-bus transfer only), **THEN**:

6.1 **IF** powering Safety Related loads on BOTH Unit 1 and Unit 2, **THEN** **ENSURE** efforts are being pursued to restore normal offsite power or EDGs to minimize the vulnerability of total reliance upon the AACG by both units.

6.2 **ENSURE** 2A3 - 2A4 Tie breaker (2A-310) open.

6.3 **ENSURE** 2A3 Supply breaker (2A-309) in PULL-TO-LOCK.

6.4 **ENSURE** 2DG1 Output breaker (2A-308) in PULL-TO-LOCK.

6.5 **IF** 2A4 **NOT** energized from AAC Generator, **THEN**:

6.5.1 **ENSURE** 2A3 - 2A4 Tie breaker (2A-410) open.

6.5.2 **IF** PLC available, **THEN**:

A. **TOUCH** ELECTRICAL BUS CONTROL.

B. **TOUCH** 4160 V BREAKERS.

C. **TOUCH** 2A-902.

6.5.3 **PERFORM** the following as needed to close 2A-902:

- ☐ **TOUCH** CLOSE on PLC.
- ☐ **USE** 2A-902 Control switch (2HS-7101).
- ☐ Locally **OPERATE** 2A-902 using Exhibit 4, AAC Generator 4160 V Breaker Operation Without DC.

6.6 **CLOSE** and **HOLD** 2A3 - 2A4 Tie (2A-310) in CLOSE position for 3 seconds.

6.7 **ENSURE** 2A3 voltage indicates approximately 4160 volts.

ATTACHMENT E

6.8 **IF** BOTH 2A3 and 2A4 energized from the AAC Generator in Modes 1-4, **THEN ENTER** Tech Spec 3.0.3.

6.9 **START** desired loads on 2A3 within the following limits:

- Any combination of Unit 1 and Unit 2 vital and non-vital buses may be energized as long as total load is less than 4400 KW.
  (4600 KW for 500 hours, 5320 KW for 30 minutes)

- Potential Unit 1 and Unit 2 loads are as follows:

COMPONENT	UNIT 1 LOAD	UNIT 2 LOAD
CHARGING PUMP	N/A	50 KW
SERVICE WATER PUMP	261 KW	640 KW
HPI/HPSI PUMP	522 KW	420 KW
LPI/LPSI PUMP	261 KW	340 KW
SPRAY PUMP	186 KW	340 KW
EFW PUMP	522 KW	500 KW
PZR PROPORTIONAL HTRS	N/A	0-180 KW
ESF BUS	800 KW	N/A

6.10 **ENERGIZE** other buses as desired using appropriate sections of this Attachment.

ATTACHMENT E

> **NOTE**
> 2A3 and 2A4 should not be supplied at the same time in Modes 1-4 except to satisfy a safety function.

7.0 **IF** desired to energize 2A4 from the AACG (Dead-bus transfer only), **THEN**:

7.1 **IF** powering Safety Related loads on BOTH Unit 1 and Unit 2, **THEN ENSURE** efforts are being pursued to restore normal offsite power or EDGs in order to minimize the vulnerability of total reliance upon the AACG by both units.

7.2 **ENSURE** 2A3 - 2A4 Tie breaker (2A-410) open.

7.3 **ENSURE** 2A4 Supply breaker (2A-409) in PULL-TO-LOCK.

7.4 **ENSURE** 2DG2 Output breaker (2A-408) in PULL-TO-LOCK.

7.5 **IF** 2A3 **NOT** energized from AAC Generator, **THEN**:

7.5.1 **ENSURE** 2A3 - 2A4 Tie breaker (2A-310) open.

7.5.2 **IF** PLC available, **THEN**:

A. **TOUCH** ELECTRICAL BUS CONTROL.

B. **TOUCH** 4160 V BREAKERS.

C. **TOUCH** 2A-902.

7.5.3 **PERFORM** the following as needed to close 2A-902:

- ☐ **TOUCH** CLOSE on PLC.
- ☐ **USE** 2A-902 Control switch (2HS-7101).
- ☐ Locally **OPERATE** 2A-902 using Exhibit 4, AAC Generator 4160 V Breaker Operation Without DC.

7.6 **CLOSE** and **HOLD** 2A3 - 2A4 Tie (2A-410) in CLOSE position for 3 seconds.

7.7 **ENSURE** 2A4 voltage indicates approximately 4160 volts.

ATTACHMENT E

7.8 **IF** BOTH 2A3 and 2A4 energized from the AAC Generator in Modes 1-4, **THEN ENTER** Tech Spec 3.0.3.

7.9 **START** desired loads on 2A4 within the following limits:

- Any combination of Unit 1 and Unit 2 vital and non-vital buses may be energized as long as total load is less than 4400 KW.
(4600 KW for 500 hours, 5320 KW for 30 minutes)

- Potential Unit 1 and Unit 2 loads are as follows:

COMPONENT	UNIT 1 LOAD	UNIT 2 LOAD
CHARGING PUMP	N/A	50 KW
SERVICE WATER PUMP	261 KW	640 KW
HPI/HPSI PUMP	522 KW	420 KW
LPI/LPSI PUMP	261 KW	340 KW
SPRAY PUMP	186 KW	340 KW
EFW PUMP	522 KW	500 KW
PZR PROPORTIONAL HTRS	N/A	0-180 KW
ESF BUS	800 KW	N/A

7.10 **ENERGIZE** other buses as desired using appropriate sections of this Attachment.

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ______

SYSTEM/DUTY AREA: Reactor Coolant System

TASK: Operate the RCS to collapse RCS Voids

JTA#: ANO2-RO-EOPAOP-OFFNORM-13

ALTERNATE PATH YES: X NO: ____ TIME CRITICAL YES: ____ NO: X

KA VALUE RO: 3.2 SRO: 3.8 KA REFERENCE: A13 AA1.3

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ____ BOTH: ____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ SIMULATOR: Perform LAB: ____

POSITION EVALUATED: RO: ____ SRO: ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ LAB: ____

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): EOP 2202.002 STANDARD ATTACHMENT 9 VOID ELIMINATION

EXAMINEE'S NAME: ______ Logon ID: ______

EVALUATOR'S NAME: ______

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ UNSATISFACTORY: ____

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ______ Stop Time ______ Total Time ______

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

JPM INITIAL TASK CONDITIONS:

- A Natural Circ Cooldown is in progress.
- RCS voiding is preventing RCS pressure from being lowered.

TASK STANDARD:

Vent path established from reactor vessel head to the containment building.

TASK PERFORMANCE AIDS:

EOP 2202.002 Rev. 23 STANDARD ATTACHMENT 9 VOID ELIMINATION

SIMULATOR SETUP:

- Natural circulation Cooldown in progress
- Depressurize the RCS until voiding occurs in the Reactor Vessel head
- RVLMS indicates level 2 or 3 wet
- Set trigger T4 to UA4R6691 (whenever 2SV4669-1 is opened)
- Close 2SV4669-1, 2SV 4668-1 and 2SV 4636-1
- Turn red and green lights off for 2HS 4671-1, 2SV4669-1, 2SV 4668-1and 2SV 4636-1

EXAMINER NOTES:

Operate the RCS to collapse RCS Voids. This is an Alternate Path JPM. The applicant is tasked with venting the Reactor Vessel Head to the Quench Tank due to indications of voids in the RCS. One head vent will be opened then when aligning the path to the Quench Tank, the Red train solenoid isolation valve to the Quench tank will lose power (along with all the RED train vent valves) and the valves will not open. The applicant should then transition to the green train vent valves and align the green train head vent to the Containment building atmosphere.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs: "Vent the Reactor Vessel Head to the Quench Tank to restore RVLMS 1 wet using 2202.010 Standard Attachment 9 starting with step 6."

START TIME: ________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	1. (Step 6/6A)	IF RVLMS indicates voiding, THEN vent Reactor Vessel as follows: Open ONE Reactor Vessel Head Vent valve (2SV-4668-1 on 2C336-1) or (2SV-4668-2 on 2C336-2).	EITHER On 2C336-1, opened Head Vent Valve 2SV-4668-1. Observed red light ON and green light OFF above 2HS-4668-1. OR On 2C336-2, opened Head Vent Valve 2SV-4668-2. Observed red light ON and green light OFF above 2HS-4668-2.	N/A SAT UNSAT
	2. (Step 6B)	Open vent path to EITHER Quench Tank (2SV-4669-1) or CNTMT (2SV-4670-2). **Examiner Note:** **2SV-4669-1 will not stroke and will have indications of a tripped breaker.** **The power supply to the valves, 2SV4669-1, 2SV4668-1, 2SV4636-1, is fused in 2C336 from 2D23.** **Examiner Cue:** **If asked direct applicant to restore RVLMS level 1 wet.**	On 2C336-1, took handswitch to the open position for Vent to Quench Tank 2SV-4669-1. Recognized valve did not open and fuse blown for valve. Observed red light OFF and green light OFF above 2HS-4669-1, 2SV4668-1, 2SV4636-1.	N/A SAT UNSAT
Examiner Note: The examinee may observe PZR level and RVLMS status to determine whether 2SV4669-1 is open. There should be no changes observed. **Examinee may report problem with valve indication (fuse blown) to CRS/SM.** **Examinee may refer to 2103.002 ECCS and High point Vent drawing exhibit posted locally.**				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
Examiner Note: The following 2 steps are the alternate path portion of this JPM				
(C)	3. (Step 6A)	Open Head Vent Valve 2SV 4668-2, if not previously opened.	On 2C336-2, opened 2SV 4668-2, if not previously opened. Observed red light ON and green light OFF above 2HS4668-2.	N/A SAT UNSAT
(C)	4. (Step 6B)	Open Vent Path to Containment atmosphere 2SV-4670-2.	On 2C336-2, opened 2SV-4670-2. Observed red light ON and green light OFF above 2HS-4670-2.	N/A SAT UNSAT
EXAMINERS NOTE: **Many possible indications are available for monitoring/trending pressurizer level and the RVLMS.**				
	5. (Step 6.C).	Monitor PZR level for trending of RCS inventory.	Monitored Pressurizer level/pressure for trending. Using control board mounted indications OR PMS/ SPDS computers, verified PZR level/pressure lowering.	N/A SAT UNSAT
	6. (Step 6.C).	Monitor RVLMS for trending of RCS inventory	Monitored the Reactor Vessel Level Monitoring System trending. Using control board mounted indications OR PMS/SPDS computers, verified RVLMS level increasing.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	7. (Step 6.D)	WHEN Reactor vessel head bubble collapsed, THEN verify vent path valves closed.	Verified Reactor vessel head bubble collapsed by RVLMS level 1 indicating WET On 2C336-2, closed 2SV 4668-2. Observed red light OFF and green light ON above 2HS4668-2. On 2C336-2, closed 2SV-4670-2. Observed red light OFF and green light ON above 2HS-4670-2.	N/A SAT UNSAT
END				

STOP TIME: ________________

EXAMINER'S COPY

INITIAL CONDITIONS:

- A Natural Circ Cooldown is in progress.
- RCS voiding is preventing RCS pressure from being lowered.

INITIATING CUE:

The CRS directs: "Vent the Reactor Vessel Head to the Quench Tank to restore RVLMS level 1 wet using 2202.010 Standard Attachment 9 starting with step 6."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

- A Natural Circ Cooldown is in progress.
- RCS voiding is preventing RCS pressure from being lowered.

INITIATING CUE:

The CRS directs: "Vent the Reactor Vessel Head to the Quench Tank to restore RVLMS level 1 wet using 2202.010 Standard Attachment 9 starting with step 6."

ATTACHMENT 9
VOID ELIMINATION

1. Verify Letdown isolated.

2. Stop RCS depressurization.

3. Pressurize and depressurize RCS within P-T limits, refer to Attachment 1, P-T Limits.

4. Monitor PZR level and RVLMS for trending of RCS inventory.

NA 5. IF voiding suspected in SG tubes,
THEN attempt to eliminate voids by using EITHER of the following:

   - Cooldown affected SG by steaming and feeding.
   - Cooldown affected SG using SG blowdown and feeding.

6. IF RVLMS indicates voiding,
THEN vent Reactor Vessel as follows:

   A. Open ONE Reactor Vessel Head Vent valve (2SV-4668-1 on 2C336-1) or (2SV-4668-2 on 2C336-2).

   B. Open vent path to EITHER Quench Tank (2SV-4669-1) or CNTMT (2SV-4670-2) valve.

   C. Monitor PZR level and RVLMS for trending of RCS inventory.

   D. WHEN Reactor vessel head bubble collapsed, THEN verify vent path valves closed.

NA 7. IF this attachment entered due to inability to depressurize AND depressurization of RCS still NOT possible,
THEN vent PZR as follows:

   A. Open ONE PZR vent valve (2SV-4636-1 on 2C336-1) or (2SV-4636-2 on 2C336-2).

   B. Open vent path to EITHER Quench Tank (2SV-4669-1) or CNTMT (2SV-4670-2) valve.

   C. Monitor PZR level and RVLMS for trending of RCS inventory.

   D. WHEN RCS depressurization completed, THEN verify vent path valves closed.

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ____________

SYSTEM/DUTY AREA: Hydrogen Recombiner

TASK: Start Up a Hydrogen Recombiner

JTA#: ANO2-RO-CONH2-NORM-3

ALTERNATE PATH YES: ______ NO: X TIME CRITICAL YES: ______ NO: X

KA VALUE RO: 4.0 SRO: 4.0 KA REFERENCE: 028 A4.01

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ______ BOTH: ______

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____________ SIMULATOR: Perform LAB: ____________

POSITION EVALUATED: RO: ____________ SRO: ____________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ LAB: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 15 Minutes

REFERENCE(S): OP-2104.044 Containment Hydrogen Control Operations

EXAMINEE'S NAME: ____________________ LOGON ID: ____________

EVALUATOR'S NAME: ____________________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____________ UNSATISFACTORY: ____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ____________ Stop Time ____________ Total Time ____________

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- LOCA in progress
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

TASK STANDARD:

Energized the Green Train Hydrogen recombiner and raised power to the required value (52 to 56 KW) to recombine hydrogen and oxygen.

TASK PERFORMANCE AIDS:

OP-2104.044 Containment Hydrogen Control Operations

SIMULATOR SETUP:

LOCA in progress.

Post-LOCA should be ~ 17.2 psia.

EXAMINER'S NOTES:

Start up a Hydrogen Recombiner. The applicant will have to start up a Hydrogen Recombiner post LOCA. They will energize the recombiner and then warm it up by raising the power output in stages. They will also determine the required power using a graph from the procedure and then adjust the output of the recombiner to plant conditions to recombine hydrogen.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs you to place 2M-55B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

START TIME:_______________

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
	1. (Step 9.2.1)	Verify Power Out switch in OFF.	Verified Power Out switch in OFF or down position.	N/A SAT UNSAT
	2. (Step 9.2.2)	Verify Power Adjust potentiometer (2POTR-6891) set to zero (000):	On 2C184 Verified Power Adjust potentiometer (2POTR-6891) set to zero (000).	N/A SAT UNSAT
	3. (Step 9.2.3)	Verify H2 Recombiner #2 supply breaker (2B-633) closed: **EXAMINER CUE:** **When contacted as NLO report that 2B-633 breaker is closed.**	Contacted a NLO to verify that breaker 2B-633 is closed.	N/A SAT UNSAT
	4. (Step 9.2.4)	Check white Power Available light illuminated.	On 2C184, checked white power light illuminated.	N/A SAT UNSAT
(C)	5. (Step 9.2.5)	Place Power Out switch to ON.	On 2C184, placed power out switch in the ON or up position. Verified Red light on above Power Out Switch.	N/A SAT UNSAT
(C)	6. (Step 9.2.6)	Turn Power Adjust potentiometer (2POTR-6891) clockwise to raise power to 5 KW (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 5 KW is indicated on 2WI-6893.	N/A SAT UNSAT
	7. (Step 9.2.7)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 5 KW for 10 minutes. **EXAMINER CUE:** **When comfortable with applicant performance instruct them 10 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 5 KW.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
(C)	8. (Step 9.2.8)	Using Power Adjust potentiometer (2POTR-6891), raise power to 10 KW (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 10 KW is indicated on 2WI-6893.	N/A SAT UNSAT
	9. (Step 9.2.9)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 10 KW (2WI-6893) for 10 minutes. EXAMINER CUE: **When comfortable with applicant performance instruct them 10 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 10 KW.	N/A SAT UNSAT
	10. (Step 9.2.10)	Determine Recombiner Temperature Correction Factor using Attachment C. EXAMINER CUE: **Attachment C has been completed and will be maintained by another operator.**	This attachment will not be completed by the examinee.	N/A SAT UNSAT
(C)	11. (Step 9.2.11)	Using Power Adjust potentiometer (2POTR-6891), raise power to 20 KW (2WI-6893).	On 2C184, turned 2POTR-6891 clockwise until ~ 20 KW is indicated on 2WI-6893.	N/A SAT UNSAT
	12. (Step 9.2.12)	Using Power Adjust potentiometer (2POTR-6891), maintain power at 20 KW (2WI-6893) for 5 minutes. EXAMINER CUE: **When comfortable with applicant performance instruct them 5 min have elapsed.**	On 2C184, monitored power meter to ensure power is maintained ~ 20 KW.	N/A SAT UNSAT

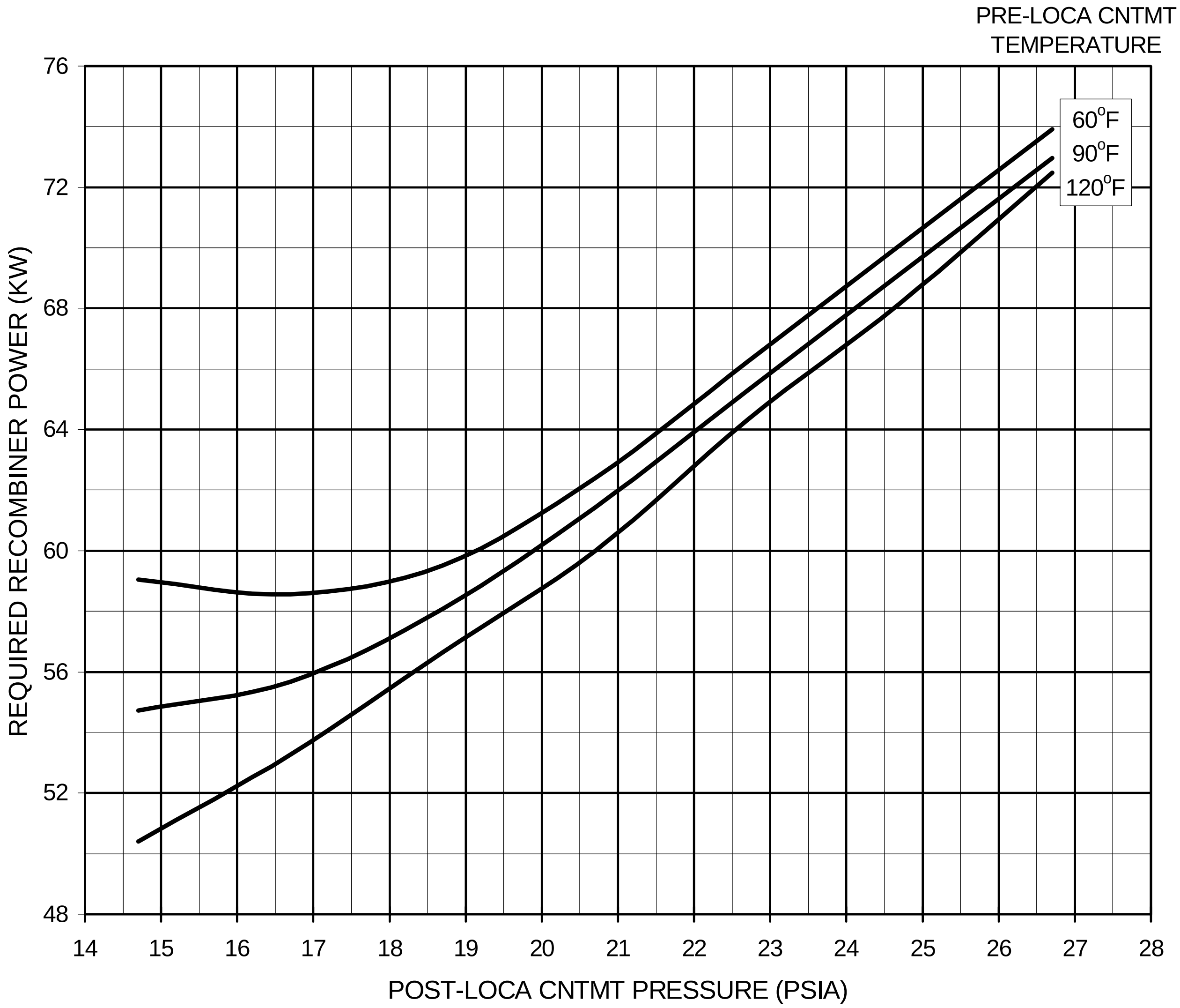
JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARD	(Circle One)
Examiner Note: acceptable numbers in the standards based on validation conditions check actual simulator conditions are similar. Attachment F is at the back of this JPM.				
	13. (Step 9.2.13)	Determine required Recombiner power using Attachment F of this procedure based on Pre-LOCA CNTMT temperature and Post-LOCA CNTMT pressure. **EXAMINER NOTE: Post-LOCA pressure is displayed in the simulator and should be ~ 17.2 psia.**	Examinee determined required Recombiner power is 52 to 56 KW from Attachment F.	N/A SAT UNSAT
(C)	14. (Step 9.2.14)	Using Power Adjust potentiometer (2POTR-6891), raise power (2WI-6893) to value determined in step 9.2.13.	Examinee raises power on 2WI-6893 using 2POTR-6891 to value determined in above step. Acceptable value is 52 to 56 KW	N/A SAT UNSAT
Examiner Note: End JPM after examinee has raised power to the Attachment F value.				
END				

Stop time: _______________

JOB PERFORMANCE MEASURE

Procedure 2104.044 Attachment F Recombiner power requirement



EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- LOCA in progress
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

INITIATING CUE:

The SM/CRS directs you to place 2M-55B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

EXAMINEE’S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- LOCA in progress
- Containment Hydrogen is >1%
- TSC has directed to start one hydrogen recombiner
- Pre-LOCA containment temperature was 120 degrees F

INITIATING CUE:

The SM/CRS directs you to place 2M-55B Hydrogen Recombiner in service using OP-2104.044 starting with step 9.2.

9.2 Perform the following to start Hydrogen Recombiner (2M-55B):

9.2.1 Verify Power Out switch in OFF.

9.2.2 Verify Power Adjust potentiometer (2POTR-6891) set to zero (ØØØ):

9.2.3 Verify H2 Recombiner #2 Supply Breaker (2B-633) closed:

9.2.4 Check white Power Available light illuminated.

9.2.5 Place Power Out switch to ON.

9.2.6 Turn Power Adjust potentiometer (2POTR-6891) clockwise to raise power to 5 KW (2WI-6893).

9.2.7 Using Power Adjust potentiometer (2POTR-6891), maintain power at 5 KW for 10 minutes.

9.2.8 Using Power Adjust potentiometer (2POTR-6891), raise power to 10 KW (2WI-6893).

9.2.9 Using Power Adjust potentiometer (2POTR-6891), maintain power at 10 KW (2WI-6893) for 10 minutes.

9.2.10 Determine Recombiner Temperature Correction Factor using Attachment C of this procedure.

9.2.11 Using Power Adjust potentiometer (2POTR-6891), raise power to 20 KW (2WI-6893).

9.2.12 Using Power Adjust potentiometer (2POTR-6891), maintain power at 20 KW (2WI-6893) for 5 minutes.

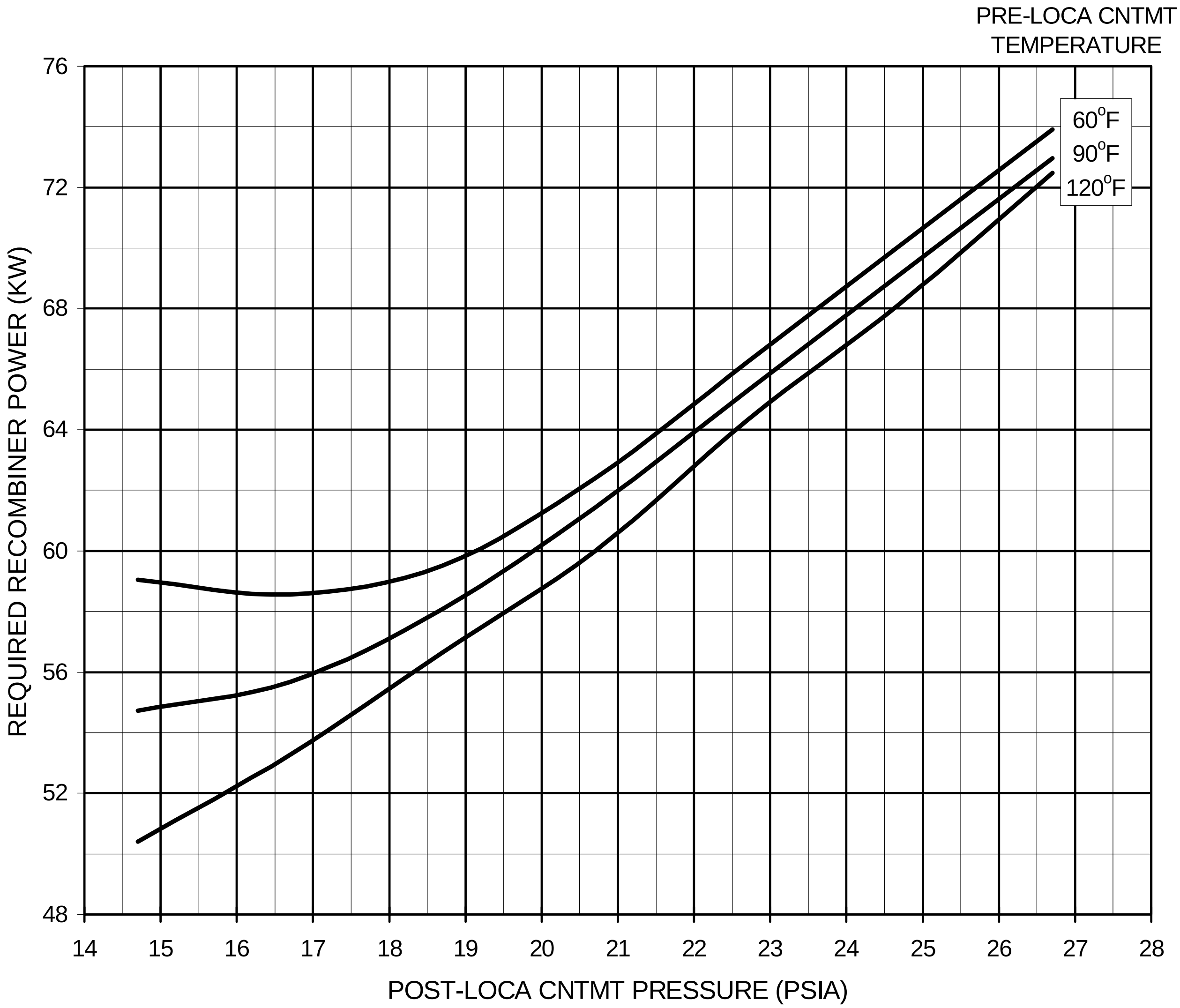
9.2.13 Determine required Recombiner power using Attachment F of this procedure based on Pre-LOCA CNTMT temperature and Post-LOCA CNTMT pressure.

9.2.14 Using Power Adjust potentiometer (2POTR-6891), raise power (2WI-6893) to value determined in step 9.2.13.

Step 9.2 continued on next page.

ATTACHMENT F

RECOMBINER POWER REQUIREMENT



JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ____________

SYSTEM/DUTY AREA: Component Cooling Water System

TASK: Secure CCW system using EOP

JTA#: ANO2-RO-EOPAOP-EMERG-22

ALTERNATE PATH YES: ______ NO: X TIME CRITICAL YES: ______ NO: X

KA VALUE RO: 3.3 SRO: 3.1 KA REFERENCE: 008 A4.01

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ______ BOTH: ______

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______ SIMULATOR: Perform LAB: ______

POSITION EVALUATED: RO: ______ SRO: ______

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ LAB: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 20 Minutes

REFERENCE(S): OP-2202.010 EOP Standard Attachment 6.

EXAMINEE'S NAME: ______________________ LOGON ID: ______________

EVALUATOR'S NAME: ______________________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______ UNSATISFACTORY: ______

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ______ Stop Time ______ Total Time ______

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL VERIFY THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The Lake Dardanelle is not available due to low lake level. (level <333')
- Service Water pump suctions and returns have been shifted to the Emergency Cooling Pond.
- A LOCA event has occurred inside Containment from full power.
- A SIAS and CCAS have been initiated due to the LOCA.
- The CRS has entered OP 2202.003 LOCA EOP from SPTAs.

TASK STANDARD:

Secured all RCPs; isolated Controlled RCP bleedoff, all condensate pumps secured in PTL, CCW isolated to containment, CCW pumps secured in PTL, MFWP turning gear secured in PTL, and MPWP lube oil pumps secured in PTL.

TASK PERFORMANCE AIDS:

OP-2202.010 EOP Standard Attachment 6, Securing CCW and ACW

SIMULATOR SETUP:

- LOCA in progress
- SIAS and CCAS Actuated
- Low Lake Level <333'
- Service Water Pumps Suctions and Returns aligned to the ECP

EXAMINER'S NOTES:

Secure CCW system using EOP. The applicant will use to Standard Attachment 6, Securing Component Cooling Water (CCW) and Auxiliary Cooling Water. The applicant will secure the Reactor Coolant Pumps (RCPs), isolate RCP controlled bleedoff, ensure letdown isolated, and ensure emergency feedwater (EFW) suction source is from a condensate storage tank. They will then contact a NLO to ensure start up and blowdown DI suction to EFW is isolated and waste gas compressors are secured. They will contact chemistry to ensure sample flows are secured. The applicant will then isolate CCW to the RCPs, secure CCW pumps, Main Feedwater Pump (MFWP) turning gear and MFWP lube oil pumps.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs: "Secure the CCW system using OP 2202.010 Attachment 6 Step 1."

START TIME:_______________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	1. (Step 1/1.A)	Secure CCW System by performing the following: Verify ALL RCPs stopped. **Examiner Note:** Applicant may start RCP lift pumps prior to securing RCPs	On 2C04, secured running RCPs and verified Green light indication is ON, RED light OFF above all 4 RCP handswitches: 2P32A 2P32B 2P32C 2P32D	N/A SAT UNSAT
	2. (Step 1.B)	Place both spray valves in MANUAL and closed.	On panel 2C04, placed spray valve man/auto select hand switches 2HS-4651B ("A" Spray Line) and 2HS-4652B ("B" Spray Line) in MANUAL. **Examiner note: valves will already be closed.**	N/A SAT UNSAT
(C)	3. (Step 1.C)	Verify ALL of the following valves closed: • RCP Bleedoff to VCT (2CV-4846-1) • RCP Bleedoff to VCT (2CV-4847-2) • RCP Bleedoff Relief to Quench Tank (2CV-4856)	On 2C16/2C17, verified GREEN light indication ON, RED light OFF above RCP BLEEDOFF handswitches for 2CV-4847-2 and 2CV-4846-1. On 2C09, placed handswitch for 2CV-4856 to Close and verified GREEN light indication ON, RED light OFF above the handswitch for RCP BLEEDOFF RELIEF ISOL TO QT 2CV-4856.	N/A SAT UNSAT
Procedure Note: The remaining steps of this attachment should have a lower priority than implementation of the controlling procedure.				

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	4. (Step 1.D)	Verify at least ONE Letdown Isolation valve closed: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred)	On panel 2C09 closed at least on Letdown isolation valve. 2CV-4820-2 OR 2CV-4821-1 OR 2CV-4823-2 Observed green light ON; red light OFF above all of the above controlled bleedoff isolation valve handswitches.	N/A SAT UNSAT
	5. (Step 1.E)	Verify EFW suction aligned to a condensate storage tank.	On panel 2C17 observed green light OFF; red light ON above handswitch for 2CV-0789 On panel 2C16 observed green light OFF; red light ON above handswitch for 2CV-0795.	N/A SAT UNSAT
	6. (Step 1.F)	Locally close "SU/BD DI TO EFW PUMP SUCT" valve (2EFW-0706).	Directed AO to locally verify 2EFW-0706 closed. OR On panel 2C33, observed green light ON; red light OFF for SU/BD DI Effluent to EFW 2EFW-0706.	N/A SAT UNSAT
(C)	7. (Step 1.G)	Verify ALL Condensate Pump handswitches in PTL.	On panel 2C02, placed the following hand switches in PULL TO LOCK: • 2HS-0609 (2P2A) • 2HS-0614 (2P2B) • 2HS-0620 (2P2C) • 2HS-0626 (2P2D) Observed green lights ON; red lights OFF above condensate pump hand switches.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	8. (Step 1.H)	Locally secure BOTH Waste Gas compressors by placing the following handswitches in OFF: • "2C75A CONTROL SWITCH" (2HS-2402A) • "2C75B CONTROL SWITCH" (2HS-2402B) **Examiner Cue:** **WCO reports both waste gas compressors are secure.**	Directed the WCO to secure both waste gas compressors by placing hand switches 2HS-2402A and 2HS-2402B in OFF on panels 2C194A/B.	N/A SAT UNSAT
	9. (Step 1.I)	Notify Chemistry to secure ALL unnecessary sample flows to the following sample panels: • 2C116 Sample System Control panel • 2C337 SG Secondary Sample panel • 2C145-I Secondary Sample panel • 2C145-II Secondary Sample panel **Examiner Cue:** **Chemistry reports sampling is secured to the following panels:** **2C116** **2C337** **2C145-I** **2C145-II**	Notified chemistry to secure all unnecessary sample flows to the following panels: • 2C116 Sample System Control Panel. • 2C337 SG Secondary Sample Panel. • 2C145-I Secondary Sample Panel. • 2C145-II Secondary Sample Panel.	N/A SAT UNSAT
(C)	10. (Step 1.J.1)	WHEN steps 1.A through 1.I complete, THEN secure CCW by performing the following: Verify closed ALL RCP CCW Isolation valves: • 2CV-5255-1 • 2CV-5254-2 • 2CV-5236-1	On Panel 2C17/2C16 closed the following valves by placing the hand swiches to close: • 2CV-5255-1 • 2CV-5236-1 • 2CV-5254-2 Observed the Red light OFF and Green light ON.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	11. (Step 1.J.2)	Place ALL CCW Pump handswitches in PTL.	Placed the following hand switches in PULL TO LOCK on panel 2C14: • 2HS-5225 (2P33A) • 2HS-5228 (2P33B) • 2HS-5234 (2P33C) Observed green lights ON and red lights OFF above hand switches.	N/A SAT UNSAT
(C)	12. (Step 1.K)	Secure BOTH MFW Pump Turning Gears by placing handswitches in PTL.	On panel 2C02, placed the following hand switches in PULL TO LOCK: • 2K-2A turning gear (2HS-0353) • 2K-2B turning gear (2HS-0333) Observed green lights ON and red lights OFF above hand switches.	N/A SAT UNSAT
(C)	13. (Step 1.L)	WHEN BOTH MFW pumps stopped, THEN place the following handswitches in PTL: • MFW Pump Auxiliary Lube Oil pump 2P26 • MFW Pump Auxiliary Lube Oil pump 2P27 • MFW Pump Emergency Lube Oil pump 2P28	On panel 2C02, placed the following hand switches in PULL TO LOCK: • 2P-26 handswitch (2HS-0331) • 2P-27 handswitch (2HS-0332) • 2P-28 handswitch (2HS-0351) Observed green lights ON and red lights OFF above hand switches.	N/A SAT UNSAT
END				

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- The Lake Dardanelle is not available due to low lake level. (level <333')
- Service Water pump suctions and returns have been shifted to the Emergency Cooling Pond.
- A LOCA event has occurred inside Containment from full power.
- A SIAS and CCAS have been initiated due to the LOCA.
- The CRS has entered OP 2202.003 LOCA EOP from SPTAs.

INITIATING CUE:

The CRS directs: "Secure the CCW system using OP 2202.010 Attachment 6 Step 1."

JOB PERFORMANCE MEASURE

EXAMINEE’S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- The Lake Dardanelle is not available due to low lake level. (level <333’)
- Service Water pump suctions and returns have been shifted to the Emergency Cooling Pond.
- A LOCA event has occurred inside Containment from full power.
- A SIAS and CCAS have been initiated due to the LOCA.
- The CRS has entered OP 2202.003 LOCA EOP from SPTAs.

INITIATING CUE:

The CRS directs: “Secure the CCW system using OP 2202.010 Attachment 6 Step 1.”

ATTACHMENT 6
SECURING CCW AND ACW

1. Secure CCW System by performing the following:

   A. Verify ALL RCPs stopped.

   B. Verify BOTH PZR Spray valves in MANUAL and closed.

   C. Verify ALL of the following valves closed:

   - RCP Bleedoff to VCT (2CV-4846-1)
   - RCP Bleedoff to VCT (2CV-4847-2)
   - RCP Bleedoff Relief to Quench Tank (2CV-4856)

NOTE

The remaining steps of this attachment should have a lower priority than implementation of the controlling procedure.

   D. Verify at least ONE Letdown Isolation valve closed:

   - 2CV-4820-2
   - 2CV-4821-1
   - 2CV-4823-2 (least preferred)

   E. Verify EFW suction aligned to CST.

   F. Locally close "SU/BD DI TO EFW PUMP SUCT" valve (2EFW-0706).

   G. Verify ALL Condensate Pump handswitches in PTL.

   H. Locally secure BOTH Waste Gas compressors by placing the following handswitches in OFF:

   - "2C75A CONTROL SWITCH" (2HS-2402A)
   - "2C75B CONTROL SWITCH" (2HS-2402B)

(Step 1 continued on next page)

I. Notify Chemistry to secure ALL unnecessary sample flows to the following sample panels:

- 2C116 Sample System Control panel
- 2C337 SG Secondary Sample panel
- 2C145-I Secondary Sample panel
- 2C145-II Secondary Sample panel

J. WHEN steps 1.A through 1.I complete,
THEN secure CCW by performing the following:

1) Verify closed ALL RCP CCW Isolation valves:

- 2CV-5255-1
- 2CV-5254-2
- 2CV-5236-1

2) Place ALL CCW Pump handswitches in PTL.

K. Secure BOTH MFW Pump Turning Gears by placing handswitches in PTL.

L. WHEN BOTH MFW pumps stopped, THEN place the following handswitches in PTL:

- MFW Pump Auxiliary Lube Oil pump 2P26
- MFW Pump Auxiliary Lube Oil pump 2P27
- MFW Pump Emergency Lube Oil pump 2P28

2. Secure ACW loads as follows:

   A. Close BOTH SG Blowdown Isolation valves:

      - 2CV-1016-1
      - 2CV-1066-1

   B. Break Condenser vacuum and secure Gland Seal steam using 2106.010, Condenser Vacuum System.

   C. Secure EH System by placing BOTH EH Pump handswitches in PTL.

   D. Secure Main Turbine Turning Gear by placing handswitch 2HS-9630 in PTL.

   E. Start Emergency Control Room chiller 2VUC-27A or 2VUC-27B.

   F. Commence Lube oil and Seal Oil system shutdown using 2106.020, Main Turbine Oil Operations.

   G. WHEN Main Turbine stopped, THEN place the following handswitches in PTL:

      - Motor Suction pump 2P19

      - Turning Gear Oil pump 2P76

   H. Verify Control Room chillers secured.

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 0 **DATE:** ______

SYSTEM/DUTY AREA: Safety Injection System

TASK: Lower Safety Injection Tank level

JTA#: ANO2-RO-ECCS-NORM-5

ALTERNATE PATH YES: ____ NO: X **TIME CRITICAL** YES: ____ NO: X

KA VALUE RO: 3.5 SRO: 3.7 **KA REFERENCE:** 006 A1.13

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ____ BOTH: ____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ **SIMULATOR:** Perform **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ LAB: ____

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 8 Minutes

REFERENCE(S): OP 2104.001 SIT OPERATIONS REV 51

EXAMINEE'S NAME: ____ **LOGON ID:** ____

EVALUATOR'S NAME: ____

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ **UNSATISFACTORY:** ____

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ____ **Stop Time** ____ **Total Time** ____

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS

- SIT 2T-2D level needs to be drained to clear the high pressure alarm.

TASK STANDARD:

2T-2D SIT level has been lowered to clear the high pressure alarm.

TASK PERFORMANCE AIDS:

OP-2104.001 SIT Operations Section 7.1

SIMULATOR SETUP:

2T-2D level is approximately 85.2% and pressure is 618 psig.

EXAMINER NOTES:

Lower Safety Injection Tank level (2T-2D). The applicant should align the SIT 2T-2D to the drain header and drain the 2T-2D to clear the high pressure alarm and then secure the drain path lineup. This task should be completed while monitoring all other SIT pressures and levels and no unplanned Technical Specifications should be entered during the evolution.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The SM/CRS directs, "Lower SIT (2T2D) level to RDT to clear the high pressure alarm using OP 2104.001; Section 7.1 beginning with Step 7.1.1. OPS B-37 does not need to be completed."

START TIME:________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER NOTE: **Steps 7.1.1 and 7.1.2 should be marked as completed/NA due to initiating cue.**				
	1 (Step 7.1.3)	* MONITOR RDT and ALL SIT levels and pressures during drain.	Monitored levels and pressures for the Reactor Drain Tank and All Safety Injection Tanks during this evolution.	N/A SAT UNSAT
	2 (Step 7.1.4	ENSURE ALL SIT Drain valves closed: (CAPR RC2, CR-ANO-2-2016-0671 CA 16) 2T-2A - SIT A Drain Valve 2SV-5001-1 (2HS-5001-1) 2T-2B - SIT B Drain Valve 2SV-5021-1 (2HS-5021-1) 2T-2C - SIT C Drain Valve 2SV-5041-2 (2HS-5041-2) 2T-2D - SIT D Drain Valve 2SV-5061-2 (2HS-5061-2)	On panel 2C17, verified green light on, red light off for SIT Drain Valves 2SV-5001-1 and 2SV5021-1. On panel 2C16, verified green light on, red light off for SIT Drain Valves 2SV-5041-2 and 2SV5061-2.	N/A SAT UNSAT
(C)	3 (Step 7.1.5)	OPEN SIT Drain to RDT 2CV-5081 (2HS-5081).	On panel 2C-33, placed handswitch for SIT Drain to RDT (2CV-5081) to OPEN. Observed red light ON, green light OFF above handswitch.	N/A SAT UNSAT
(C)	4. (Step 7.1.6)	If desired level drop less than ½%, THEN CLOSE 2CV-5081 (2HS-5081).	On panel 2C33, placed handswitch for SIT Drain to RDT (2CV-5081) to CLOSED. Observed green light ON, red light OFF above handswitch.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
	5. (Step 7.1.7)	*MONITOR SIT Injection header pressure for SIT being drained: SIS Injection to Loop 2P-32D (2PIS-5060)	On panel 2C16 observed 2PIS-5060 < 650 psig.	N/A SAT UNSAT
EXAMINER NOTE: **Step 7.1.8 should be marked as N/A since SIT Injection HDR pressure will be <650 psig.**				
	6. (Step 7.1.8)	IF pressure of SIT Injection header being drained greater than 650 psig, THEN:	Applicant determines step is Not Applicant	N/A SAT UNSAT
(C)	7. (Step 7.1.9)	Open selected SIT Drain Valve: 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)	On panel 2C16, placed handswitch for SIT 'D' Drain Valve (2SV-5061-2) to OPEN. Observed red light ON, green light OFF above handswitch.	N/A SAT UNSAT
PROCEDURE NOTE If SIT drain header pressurized, SIT Drain valves may be slow to close due to no DP. (CR-ANO-2-2004-0802, EC-34646)				
(C)	8. (Step 7.1.10)	WHEN desired SIT level or pressure reached, THEN CLOSE applicable SIT Drain valve: 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)	Verified SIT (2T2D) High Pressure alarm has cleared. On panel 2C16, placed handswitch for SIT D Drain Valve (2SV-5061-2) to CLOSE. Observed green light ON, red light OFF above handswitch.	N/A SAT UNSAT
EXAMINER NOTE: **Step 7.1.11 and 7.1.12 should be marked as N/A.**				
	9. (Step 7.1.13)	ENSURE SIT Drain to RDT 2CV-5081 (2HS-5081) closed.	On panel 2C33, placed OR verified handswitch for SIT Drain to RDT (2CV-5081) in CLOSE. Observed green light ON, red light OFF above handswitch.	N/A SAT UNSAT
END				

STOP TIME:________________

JOB PERFORMANCE MEASURE

Examiner's Copy

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- SIT 2T-2D level needs to be lowered to clear the high pressure alarm.

INITIATING CUE:

- The SM/CRS directs, "Lower SIT (2T2D) level to RDT to clear the high pressure alarm using OP 2104.001; Section 7.1 beginning with Step 7.1.1. "

- OPS B-37 does not need to be completed.

JOB PERFORMANCE MEASURE

Examinee's Copy

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- 2T-2D SIT level needs to be lowered to clear the High Pressure alarm.

INITIATING CUE:

- The SM/CRS directs, "Lower SIT (2T2D) level to RDT to clear the high pressure alarm using OP 2104.001; Section 7.1 beginning with Step 7.1.1. "
- OPS B-37 does not need to be completed.

7.0 LOWERING SAFETY INJECTION TANK LEVEL

7.1 Draining SITs to RDT in Mode 1, 2, 3, or 4 with SIT Outlet Valves Open

7.1.1 **IF** source of SIT in-leakage unknown,
THEN INITIATE OPS-B37, SIT Level Change as desired.

7.1.2 **IF** OPS-B37, SIT Level Change being maintained for applicable SIT,
THEN RECORD initial level on OPS-B37.

* 7.1.3 **MONITOR** RDT and ALL SIT levels and pressures during drain.

7.1.4 **ENSURE** ALL SIT Drain valves closed:
(CAPR RC2, CR-ANO-2-2016-0671 CA 16)

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

7.1.5 **OPEN** SIT Drain to RDT 2CV-5081 (2HS-5081).

7.1.6 **IF** desired level drop less than 1/2%,
THEN CLOSE 2CV-5081 (2HS-5081).

* 7.1.7 **MONITOR** SIT Injection header pressure for SIT being drained:

- SIS Injection to Loop 2P-32A (2PIS-5000)
- SIS Injection to Loop 2P-32B (2PIS-5020)
- SIS Injection to Loop 2P-32C (2PIS-5040)
- SIS Injection to Loop 2P-32D (2PIS-5060)

7.1.8 **IF** pressure of SIT Injection header being drained greater than 650 psig, **THEN**:

A. **CYCLE** selected valve open for maximum of ten seconds:

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

B. **WAIT** at least six minutes.

C. **IF** additional drain needed after six minute wait,
THEN CYCLE valve open for maximum of ten seconds.

D. **WAIT** at least two hours before repeating this sequence.

E. **GO TO** step 7.1.11.

7.1.9 **OPEN** selected SIT Drain valve:

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

NOTE

If SIT drain header pressurized, SIT Drain valves may be slow to close due to no DP. (CR-ANO-2-2004-0802, EC-34646)

7.1.10 **WHEN** desired SIT level or pressure reached,
THEN CLOSE applicable SIT Drain valve:

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

7.1.11 **IF** desired to raise SIT pressure,
THEN ADD nitrogen to associated SIT IAW Raising Safety Injection Tank Pressure section of this procedure.

7.1.12 **IF** drain stopped based on SIT pressure,
AND continued draining desired,
THEN:

A. **WAIT** two hours.

B. **REPEAT** steps 7.1.5 through 7.1.11.

7.1.13 **ENSURE** SIT Drain to RDT 2CV-5081 (2HS-5081) closed.

NOTE
If SIT drain header pressurized, SIT Drain valves may be slow to close due to no DP. (CR-ANO-2-2004-0802, EC-34646)

7.1.14 **IF** SIT drained with SIT Drain to RDT (2CV-5081) open,
THEN:

A. **OPEN** associated SIT Drain valve to repressurize drain header:

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

B. **WHEN** SIT Drain header pressurized,
THEN CLOSE SIT Drain valve opened in previous step:

- 2T-2A - SIT A Drain valve 2SV-5001-1 (2HS-5001-1)
- 2T-2B - SIT B Drain valve 2SV-5021-1 (2HS-5021-1)
- 2T-2C - SIT C Drain valve 2SV-5041-2 (2HS-5041-2)
- 2T-2D - SIT D Drain valve 2SV-5061-2 (2HS-5061-2)

7.1.15 **IF** desired to raise SIT pressure,
THEN ADD nitrogen to associated SIT IAW Raising Safety Injection Tank Pressure section of this procedure.

7.1.16 **IF** OPS-B37, SIT Level Change being maintained for drained SIT,
THEN RECORD final level on OPS-B37.

JOB PERFORMANCE MEASURE

UNIT: 2 REV #: 0 DATE: ______

SYSTEM/DUTY AREA: Abnormal/Emergency Operations

TASK: Perform control element assembly exercise.

JTA#: ANO2-RO-CEDM-SURV-13

ALTERNATE PATH YES: X NO: ______ TIME CRITICAL YES: ______ NO: X

KA VALUE RO: 3.5 SRO: 4.2 KA REFERENCE: 001 A2.03

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ______ BOTH: ______

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ______ SIMULATOR: Perform LAB: ______

POSITION EVALUATED: RO: ______ SRO: ______

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ______ PLANT SITE: ______ LAB: ______

TESTING METHOD: SIMULATE: ______ PERFORM: ______

APPROXIMATE COMPLETION TIME IN MINUTES: 10 Minutes

REFERENCE(S): OP 2105.009 Rev.36 and ACA 2203.012J Rev. 43

EXAMINEE'S NAME: ______ LOGON ID: ______

EVALUATOR'S NAME: ______

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ______ UNSATISFACTORY: ______

PERFORMANCE CHECKLIST COMMENTS:

______

______

Start Time ______ Stop Time ______ Total Time ______

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- OP-2105.009 Supplement 2, "CEA Exercise Test" is completed successfully for all CEA's except CEA # 46.
- Reactivity Management Brief is complete
- Voltage traces are setup to be taken on CEA #46
- No CEAs are on or need to be on the Hold Bus.
- No T-alt is installed on either RSPT for CEA #46.
- Unit 2 is currently at 260 EFPD.

TASK STANDARD:

- CEA #46 has been withdrawn to the Upper Electrical limit, inserted ~ 5"
- CEA movement stopped after taking the CEDMCS control switch to OFF.
- These actions have to occur before reaching the CEA Lower Electrical Limit (LEL) and the applicant does not manually trip the reactor.

TASK PERFORMANCE AIDS:

- Copy of partially completed OP-2105.009 Supplement 2.
- OP-2203.012J, 2K10 D-1 ACA Minor CEA Deviation
- OP-2203.012J, 2K10 C-1 ACA Major CEA Deviation
- OP 2203.002 CEA Malfunction AOP

SIMULATOR SETUP:

- All CEA's withdrawn to programmed insertion limit.
- Verify group 6 & CEA # 46 not selected on CEDMCS insert.
- Insert switch override, DI_JC_9058_44 to true (CEA shim switch for insert) to a trigger that is set to FN3i905a that causes CEA 46 to continue to insert when CEDMCS shim switch is taken to insert and will not stop moving until the CEDMCS control switch is taken to stop.

EXAMINER NOTES:

Perform control element assembly exercise. This is an Alternate Success Path JPM. The examinee will be tasked with exercising a CEA for it required surveillance. When insertion demand is terminated the CEA will continue to move into the core. The examinee should take action to stop the unintended CEA movement.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, "Complete the CEA Exercise Test for CEA #46 using OP 2105.009 Supplement 2, Step 3.2.5."

START TIME: _______________

		PERFORMANCE CHECKLIST	STANDARDS	(Circle One)
Examiner's Note: **Examinee may elect to review the CEA malfunction AOP prior to starting this JPM.** **Examinee should circle Step 3.2.5.A and move on to next step due to being a continuous action step.**				
	1. Step 3.2.5.B	ENSURE CEA within 7 inches of other CEAs in the group using operable CEA Position indicators. (TS 3.1.3.1)	Using RSPT1, RSPT2 or Pulse counter readings on PMS, examinee verified that CEA 46 remains within 7" of all Group 6 CEA's throughout exercise.	N/A SAT UNSAT
	2. Step 3.2.5.C	SELECT position indication for CEA to be exercised on ALL available CEAC Operator Module digital displays.	On panel 2C03, examinee displayed CEA #46 on all available CEAC module displays by one of the following methods: - Standard OM, - CEA group plot (Group 6 selected) - CEA values Page 2 - CEA subgroup plot (Group 6 selected)	N/A SAT UNSAT
(C)	3. Step 3.2.5.D	PLACE Group Select switch to group containing individual CEA.	On panel 2C03, Group Select Switch selected to CEA Group 6 by examinee. **(Not Critical)** Examinee observed Group 6 white status light on the top row of the Group 6 CEA indicating lights ON.	N/A SAT UNSAT
(C)	4. Step 3.2.5.E	PLACE Individual CEA Selection switches to CEA to be exercised.	On panel 2C03, examinee selected CEA #46. **(Not Critical)** Examinee observed the TENS in "4" and the UNITS in "6". <u>OR</u> Examinee observed CEA #46 individual light ON.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
(C)	5. Step 3.2.5.F	ENSURE the mode select switch to in MANUAL INDIVIDUAL.	On panel 2C03, examinee placed mode select switch to MI. **(Not Critical)** Examinee observed MI (MANUAL INDIVIDUAL) light ON.	N/A SAT UNSAT
	6. Step 3.2.5.G	ENSURE CEA to be exercised is at UEL.	On insert 2JC-9058, examinee moved CEA 46 to UEL by going to WITHDRAW on CEA insert until CEA #46 Upper Electrical Limit (UEL) red light on. Examinee observed UEL red light ON.	N/A SAT UNSAT
(C)	7. Step 3.2.5.H	INSERT CEA seven steps (greater than or equal to 5 inches by RSPT).	Examinee inserted CEA seven steps (≥ 5”). Examinee observed insertion of 5.0 inches or greater on CEAC's #1 and #2 displays.	N/A SAT UNSAT
EXAMINER’S NOTE: This is the Alternate Path Portion of the JPM. As CEA #46 is inserted the CEA will not stop moving until the CEDMCS control switch, 2JC-9058, is taken to OFF. If ACA’s or AOP’s are desired, then let them use the copies in the Simulator.				
(C)	8. Step: N/A	Recognize CEA # 46 has not stopped moving when shim switch is returned to center position. **EXAMINER’S CUE:** **If examinee asks for guidance from CRS, ask examinee for their recommendation.**	On CEAC inserts and PMS pulse counter indication, the examinee observed CEA #46 continuing to insert.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

EXAMINER'S NOTE:

- **CEA minor deviation alarm will occur at ~146.5" withdrawn (Other CEA's in Group 6 are withdrawn and alarm actuates with 3" deviation).**
- **CEA Major Deviation alarm will annunciate at ~ 143.5" withdrawn (at 6" deviation).**
- **At 140.38" the CEAC's will begin calculation and activate deviation alarms on 2K04, J5, J6, CEAC deviation alarms.**

These alarms are entry conditions for the CEA Malfunction AOP 2203.003 where the guidance is found in Step 2 of the AOP to "Stop ALL CEA movement".

CEA will insert at ~30"/minute and will take about 5 minutes for CEA to insert to the lower electrical limit, LEL.

(C)	9. AOP 2203.003 Step 2	Stop ALL CEA movement.	CEDMCS control switch, 2JC-9058, is taken to OFF by examinee before the lower electrical limit (LEL) is reached. AND Examinee verified by CEAC and Pulse counter indication that the CEA movement stops. AND Examinee does not trip reactor.	N/A SAT UNSAT
	10. Step: N/A	Reports that CEA #46 did not stop moving until the CEDMCS control switch was taken to OFF. **<u>Examiner's CUE:</u> Acknowledge the problem with CEDMCS and that the CRS will take care of the CR and possible Tech Spec entry.**	Examinee reports to the CRS that CEA #46 did not stop moving until the CEDMCS control switch was taken to OFF and possible entry into the CEA malfunction AOP.	N/A SAT UNSAT
END				

Stop Time: _______________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- OP-2105.009 Supplement 2, "CEA Exercise Test" is completed successfully for all CEA's except CEA # 46.
- Reactivity Management Brief is complete
- Voltage traces are setup to be taken on CEA #46
- No CEAs are on or need to be on the Hold Bus.
- No T-alt is installed on either RSPT for CEA #46.
- Unit 2 is currently at 260 EFPD.

INITIATING CUE:

The CRS directs, "Complete the CEA Exercise Test for CEA #46 using OP 2105.009 Supplement 2, Step 3.2.5."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- OP-2105.009 Supplement 2, "CEA Exercise Test" is completed successfully for all CEA's except CEA # 46.
- Reactivity Management Brief is complete
- Voltage traces are setup to be taken on CEA #46
- No CEAs are on or need to be on the Hold Bus.
- No T-alt is installed on either RSPT for CEA #46.
- Unit 2 is currently at 260 EFPD.

INITIATING CUE:

The CRS directs, "Complete the CEA Exercise Test for CEA #46 using OP 2105.009 Supplement 2, Step 3.2.5."

NOTE

The following apply to CEAs placed on the Hold Bus:

- CEAs are declared inoperable due to inability to move from the Control room.
- Entry into TS 3.1.3.1 Action C is required.
- CEAs are considered inoperable but trippable since Hold Buses are de-energized when TCBs open so all CEAs on Hold Bus will be inserted on a reactor trip.
- CEAs are considered as available for insertion for shutdown margin.
- CEAs are considered as having their full negative reactivity insertion potential and no SDM penalties should be applied unless CEA is known to be untrippable.

CAUTION

A CEA with known problems (e.g., coil with missing phase) should be bumped one step and then stopped to allow I&C Maintenance to evaluate for additional problems on coil traces. Coordinate with I&C Maintenance and System Engineering for appropriate actions If additional problems are found. (CR-ANO-2-2001-0611)

3.2 Test Method

* 3.2.1 **IF** required to place CEAs on Hold Bus, **THEN ENTER** Tech Spec 3.1.3.1, Action C (CEAs inoperable but trippable, no SDM penalty).

* 3.2.2 **IF** CEAs placed on Hold Bus for any reason, **THEN**:

A. **ENSURE** CEAs removed from Hold Bus.

B. **EXIT** TS 3.1.3.1.C.

3.2.3 **IF** voltage traces desired by Operations Management and I&C, **THEN COORDINATE** with I&C to perform voltage traces concurrent with CEA exercises.

SUPPLEMENT 2

CAUTION

- Both PMS and COLSS receive pulse counter input. If CEA pulsed inward too far, the excessive peaking factors generated will render COLSS inoperable. When pulsing CEA in groups 1 through 5, with group out of sequence, this occurs at 142.5". For CEA in any group, this occurs at 10" deviation from its group.
- If the CEA providing position indication for another CEA drops, the associated CEAC will see two dropped CEAs instead of one. Placing associated CEAC in INOP will prevent unnecessary trip if this happens.
- Do not simultaneously insert CEAs from Groups 5 and 6 below 146.25 inches. Large Planar Radial Peaking Factors will be applied to CPC calculations, likely resulting in channel trips.
- Group 6 and Group P CEAs should be exercised first during the CEA Exercise Test to ensure CEAs used for ASI control are available in event of a required power reduction.

3.2.4 **IF** a CEA RSPT is providing position indication to another CEA by installation of a T-Mod,
THEN PLACE associated CEAC in INOP in all 4 CPC channels using 2105.001, CPC/CEAC Operations prior to exercising the CEA that is providing position indication.

- Example: If CEA 46 RSPT 2 is providing position indication for CEA 1, then place CEAC 2 in INOP prior to exercising CEA 46.

3.2.5 Exercise CEAs in Table 1 as follows:

* A. **IF** CEA movement delayed for extended period,
THEN ENSURE Mode Select switch in OFF.

* B. **ENSURE** CEA within 7 inches of other CEAs in the group using operable CEA Position indicators. (TS 3.1.3.1)

C. **SELECT** position indication for CEA to be exercised on ALL available CEAC Operator Module digital displays.

D. **PLACE** Group Select switch to group containing individual CEA.

E. **PLACE** Individual CEA Selection switches to CEA to be exercised.

RAP

F. **ENSURE** Mode Select switch in MANUAL INDIVIDUAL.

G. **ENSURE** CEA to be exercised is at UEL.

NOTE

- CEA insertion is verified to be ≥ 5" by observation of RSPTs. Observing 5.25" change in pulse counter position does not mean CEA has moved ≥ 5".
- If all CEAs in the subgroup of CEA being inserted are above upper alarm deadband of 140.83 inches, CEAC 1 or 2 CEA Deviation annunciators (2K04 J-5/J-6) will not actuate
- Use of CEAC #1 and CEAC #2 standard OM Module to monitor raw input signal is recommended to ensure CEA movement of 5 inches. CEAC group display uses process CEA positions that are rounded off to nearest inch.
- Due to scheduling or component malfunction it is acceptable for CEAs to be inserted to other than 2102.004, Power Operations, Attachment D Programmed Insertion Limit.

H. **INSERT** CEA seven steps (greater than or equal to 5 inches by RSPT).

I. **RETURN** CEA to UEL.

J. **ENSURE** CEA returned to position required by 2102.004, Power Operation, Attachment D.

K. **RECORD** results on Table 1.

L. **WHEN** all required CEA movements complete,
THEN ENSURE Mode Select switch in OFF.

3.2.6 **IF** either CEAC placed in INOP for this exercise,
THEN REMOVE from INOP in all four CPC channels using 2105.001, CPC/CEAC Operations.

3.2.7 **IF** any CEA or CEDMCS circuits require maintenance,
THEN:

A. Complete repairs.

B. List affected CEAs in step 4.3.

4.0 ACCEPTANCE CRITERIA

4.1 Has each CEA been determined operable by movement of greater than or equal to 5 inches in any direction by RSPT indication? YES NO

4.2 **<u>IF</u>** NO is circled above,
<u>THEN</u>:

- **DECLARE** affected CEAs inoperable.
- **REFER** to Tech Spec 3.1.3.1.
- **NOTIFY** S/M.
- **INITIATE** Condition Report.

4.3 Comments: ____

____

____

____

Performed By ______________________________________ Date __________

____

5.0 SUPERVISOR REVIEW AND ANALYSIS

5.1 Are CEAs operable as required by Acceptance Criteria? YES NO

5.2 **<u>IF</u>** answer to 5.1 is NO,
<u>THEN</u> describe action taken below:

____

____

____

____

5.3 Are all administrative requirements of this test satisfied? YES NO

Supervisor ______________________________________ Date __________

SUPPLEMENT 2

TABLE 1

CEA#	**SELECT** position indication for CEA being exercised	**PLACE** group select switch to group containing CEA	**PLACE** individual CEA select switches to CEA being exercised	**ENSURE** mode select switch in Manual Individual	**ENSURE** CEA at UEL	**INSERT** CEA ≥ 5 inches by RSPT indication	**RETURN** CEA to UEL	**RETURN** CEA to program insertion limit as required	Voltage trace obtained?		CEA exercised satisfactory?	
	√	√	√	√	√	√	√	√	YES	NO	YES	NO
P-22	√	√	√	√	√	√	√	√	YES		YES	
P-23	√	√	√	√	√	√	√	√	YES		YES	
P-24	√	√	√	√	√	√	√	√	YES		YES	
P-25	√	√	√	√	√	√	√	√	YES		YES	
P-26	√	√	√	√	√	√	√	√	YES		YES	
P-27	√	√	√	√	√	√	√	√	YES		YES	
P-28	√	√	√	√	√	√	√	√	YES		YES	
P-29	√	√	√	√	√	√	√	√	YES		YES	
6-1												
6-46	√	√	√	√	√	√	√	√	YES		YES	
6-47	√	√	√	√	√	√	√	√	YES		YES	
6-48	√	√	√	√	√	√	√	√	YES		YES	
6-49	√	√	√	√	√	√	√	√	YES		YES	
B-2	√	√	√	√	√	√	√	√	YES		YES	
B-3	√	√	√	√	√	√	√	√	YES		YES	
B-4	√	√	√	√	√	√	√	√	YES		YES	
B-5	√	√	√	√	√	√	√	√	YES		YES	
2-6	√	√	√	√	√	√	√	√	YES		YES	
2-7	√	√	√	√	√	√	√	√	YES		YES	
2-8	√	√	√	√	√	√	√	√	YES		YES	
2-9	√	√	√	√	√	√	√	√	YES		YES	

ANNUNCIATOR 2K04

J-5

CEAC 1 CEA DEVIATION

1.0 CAUSES

NOTE

Alarm will NOT be generated if either of the following conditions present:

- CEA that is deviating (lowest in subgroup) at or above upper alarm deadband (≥ 140.83”)
- CEA that is deviating (highest in subgroup) at or below lower alarm deadband (≤ 9.17”).

1.1 CEA deviation within a subgroup > 5 inches.

1.2 CEA RSPT failure which is interpreted by the CEAC to be a deviation within that particular subgroup.

2.0 ACTION REQUIRED

CAUTION

If all of the following conditions exist, a reactor trip may occur:

- CEA between 11.42 and 138.58 inches withdrawn
- CEA failed sensor
- Associated CEAC NOT in INOP

2.1 Use CEAC display AND PMS Function N4 to determine affected CEA.

2.2 Compare both CEACs to determine whether an actual deviation exists or the RSPT has failed.

2.3 IF actual deviation has occurred,
THEN refer to CEA Malfunction (2203.003).

2.4 IF only one CEAC shows deviation,
THEN place affected CEAC in INOP using CPC/CEAC Operations (2105.001).

2.5 Troubleshoot failure using CPC/CEAC Operations (2105.001).

2.6 Contact I&C and Computer Support to troubleshoot and repair.

2.7 Refer to Tech Spec Table 3.3-1.

(Continued on next page)

ANNUNCIATOR 2K04

J-5

CEAC 1 CEA DEVIATION
(Continued)

3.0 TO CLEAR ALARM

3.1 Eliminate CEA deviation.

4.0 REFERENCES

4.1 E-2454-1

CEA MALFUNCTION

PURPOSE

This procedure provides actions for a CEA malfunction.

ENTRY CONDITIONS

Plant in Mode 1 or 2 and ANY of the following exist:

1. "CEAC 1/2 CEA DEVIATION" annunciator (2K04-J5/J6) in alarm.
2. Indications of a dropped or misaligned CEA on any of the following:
   - CEAC Display
   - SPDS Display
   - CEDMCS Insert
3. "MAJOR CEA DEVIATION" annunciator (2K10-C1) in alarm.
4. A CEA is immovable.
5. Uncontrolled CEA motion is occurring.

EXIT CONDITIONS

WHEN ANY of the following exists,
THEN EXIT this procedure:

1. ALL Regulating Group CEAs and ALL Group P CEAs which are inserted in the core, SHALL be operable with EACH CEA of a given group less than 5 inches outward deviation and 7 inches inward deviation of ALL other CEAs in its group, ALL Shutdown Bank CEAs SHALL be fully withdrawn OR the actions of TS 3.1.3.1, CEA Position are being met.
2. Procedure complete and Plant Shutdown commenced using 2102.004, Power Operation.
3. ALL Regulating Group CEAs and Group P CEAs fully inserted and Reactor startup aborted.

INSTRUCTIONS	CONTINGENCY ACTIONS

NOTE
• Attachment D provides trip and shutdown criteria. • Attachment E provides a list of possible Tech Spec actions to be taken within two hours of procedure entry. • Steps marked with (*) are continuous action steps. • Steps marked with (■) are floating steps.

1. **OPEN** Placekeeping page.	
2. **STOP** ALL CEA movement.	2. **PERFORM** the following: A. **TRIP** Reactor. B. **GO TO** 2202.001, Standard Post Trip Actions.
3. **NOTIFY** Control Board Operators to monitor floating steps.	

JOB PERFORMANCE MEASURE

UNIT: 2 **REV #:** 2 **DATE:** ____________

SYSTEM/DUTY AREA: Reactor Coolant Pump

TASK: Perform a normal RCP shutdown

JTA#: ANO-2-RO-RCP-NORM-3

ALTERNATE PATH YES: X NO: ____ **TIME CRITICAL** YES: ____ NO: X

KA VALUE RO: 3.7 SRO: 3.9 **KA REFERENCE:** 003 A2.02

APPROVED FOR ADMINISTRATION TO: RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ____ BOTH: ____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____ **SIMULATOR:** Perform **LAB:** ____

POSITION EVALUATED: RO: ____ SRO: ____

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ LAB: ____

TESTING METHOD: SIMULATE: ____ PERFORM: ____

APPROXIMATE COMPLETION TIME IN MINUTES: 8 Minutes

REFERENCE(S): OP 2103.006 RCP Operations Rev.31; OP 2203.012K ACA for 2K11 Rev. 46

EXAMINEE'S NAME: ____________ **LOGON ID:** ____________

EVALUATOR'S NAME: ____________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____ **UNSATISFACTORY:** ____

PERFORMANCE CHECKLIST COMMENTS:

____

____

Start Time ____ **Stop Time** ____ **Total Time** ____

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS

The Unit is in Mode 3.

TASK STANDARD:

All RCP's secured within 10 minutes of receiving the 'A' RCP reverse rotation alarm.

TASK PERFORMANCE AIDS:

OP 2103.006 RCP OPS Rev. 31 Section 8.0, OP-2203.012K ACA for 2K11-C2 Rev. 46

SIMULATOR SETUP:

Mode 3.
All RCP's running.
Set malfunction RCP2P32AREV to a trigger with a 35 second time delay.
Set the trigger to gh4g4620 (green light for 2P-32A)

EXAMINER NOTES:

Perform a normal RCP shutdown. This JPM is ALTERNATE PATH. When securing the 1st RCP 2P-32A, a valid Reverse Rotation Alarm will come in which will require a transition to the Alarm Corrective Action procedure which requires securing all RCPs for a Valid alarm to stop the reverse rotation on 2P-32A.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs, "Shutdown RCP 2P-32A using OP 2103.006 Section 8.0."

Start Time: ________________

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
PROCEDURE NOTE If the last two RCPs will be secured simultaneously, Operations management has determined stationing a local operator is not required.				
	1. (Step 8.1)	Place associated Lift Pump handswitch to START: • 2P-32A Lift Pump 2P-63A (2HS-6084) **EXAMINER CUE:** **Local lift pump discharge pressure is adequate.**	On panel 2C04, placed 2HS-6084 for 2P63A to START. Observed red light on; green light OFF above 2HS-6084.	N/A SAT UNSAT
(C)	2. (Step 8.2)	Stop selected reactor coolant pump • 2P-32A (2HS-4620)	On panel 2C04, placed 2HS-4620 for 2P32A to STOP. Observed green light ON; red light OFF above 2HS-4620.	N/A SAT UNSAT
	3. (Step 8.2.1)	IF RCP 2P-32A stopped, THEN verify the following: RCS RCP 2P-32A PZR Spray (2HS-4651B) in MANUAL. RCS RCP 2P-32A PZR Spray (2HS-4651A) valve CLOSED.	On panel 2C04, placed 2HS-4651B in MANUAL. On panel 2C04, placed 2HS-4651A in CLOSED. Observed green light ON; red light OFF above 2HS-4651A.	N/A SAT UNSAT

JOB PERFORMANCE MEASURE

PERFORMANCE CHECKLIST			STANDARDS	(Circle One)
EXAMINER NOTE: At this point the A' RCP Reverse Rotation Alarm will come in and the applicant will transition to the Annunciator Corrective Action for annunciator 2K11-C2 of OP-2203.012. (He may know the ACA required action from memory) The action is to secure the rest of the RCPs to prevent reverse overspeed of the A RCP. **This is the Alternate Path portion of this JPM.**				
	4 (Step NA)	Acknowledges 2K11-C2 'A' RCP Reverse Rotation Alarm Time:____________ **EXAMINER CUE:** **If examinee tells the CRS of the reverse rotation alarm, then inform the examinee as the CRS to take the appropriate action.** **EXAMINER CUE:** **If examinee asks for a NLO report of 'A' RCP report the shaft is rotating in the opposite direction.**	On panel 2K11 recognized 'A' RCP Reverse Rotation Alarm	N/A SAT UNSAT
(C)	5. (Step 2.4.1)	IF 2P-32A Reverse Rotation alarm valid, THEN perform the following: Secure ALL operating RCPs: • 2P-32B (2HS-4621) • 2P-32C (2HS-4720) • 2P-32D (2HS-4721)	On panel 2C04, placed the handswitches for the following RCP's in STOP: 2P-32B Time:___________ 2P-32C Time:___________ 2P-32D Time:___________ **All RCPs must be stopped within 10 minutes of receiving reverse rotation alarm.**	N/A SAT UNSAT
	6. (Step 2.4.2)	IF RCP (2P-32B) was stopped, THEN verify B Spray Valve (2HS-4652B) in MANUAL and CLOSED.	On panel 2C04, placed 2HS-4652B in MANUAL. On panel 2C04, placed 2HS-4652A in CLOSED. Observed green light ON; red light OFF above 2HS-4652A.	N/A SAT UNSAT
END				

Stop Time: _________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

The unit is in Mode 3.

INITIATING CUE:

The SM/CRS directs, "Shut down RCP 2P-32A using OP 2103.006 Section 8.0."

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

The unit is in Mode 3.

INITIATING CUE:

The SM/CRS directs, "Shut down RCP 2P-32A using OP 2103.006 Section 8.0."

8.0 REACTOR COOLANT PUMP SHUTDOWN

NOTE

If the last two RCPs will be secured simultaneously, Operations management has determined stationing a local operator is not required.

8.1 Place associated Lift Pump handswitch in START:

- 2P-32A Lift pump 2P-63A (2HS-6084)
- 2P-32B Lift pump 2P-63B (2HS-6094)
- 2P-32C Lift pump 2P-63C (2HS-6104)
- 2P-32D Lift pump 2P-63D (2HS-6114)

8.2 Stop SELECTED Reactor Coolant pump.

- 2P-32A (2HS-4620)
- 2P-32B (2HS-4621)
- 2P-32C (2HS-4720)
- 2P-32D (2HS-4721)

8.2.1 IF RCP 2P-32A stopped,
THEN verify the following:

- RCS RCP 2P-32A PZR Spray (2HS-4651B) in MANUAL.
- RCS RCP 2P-32A PZR Spray (2HS-4651A) valve CLOSED.

8.2.2 IF RCP 2P-32B stopped,
THEN verify the following:

- RCS RCP 2P-32B PZR Spray (2HS-4652B) in MANUAL.
- RCS RCP 2P-32B PZR Spray (2HS-4652A) valve CLOSED.

8.3 WHEN RCP reaches zero speed as indicated on PMS or CPCs,
THEN place associated Lift Pump handswitch in STOP.

- 2P-32A Lift pump 2P-63A (2HS-6084)
- 2P-32B Lift pump 2P-63B (2HS-6094)
- 2P-32C Lift pump 2P-63C (2HS-6104)
- 2P-32D Lift pump 2P-63D (2HS-6114)

ANNUNCIATOR 2K11

C-2

REVERSE ROTATION

1.0 CAUSES

1.1 Reactor Coolant Pump 2P-32A reverse oil flow that corresponds to rotational speed of 75 to 200 RPM in reverse direction (2FS-608l)

2.0 ACTION REQUIRED

2.1 Check Reactor Coolant pump (2P-32A) status.

NOTE

Relays associated with 2FS-6081 (2P-32A) and 2FS-6091 (2P-32B) are protected by single fuse F23 in cabinet 2C-21. Blown fuse is probable cause if both annunciators C-2 and C-4 in alarm. (reference E-2181-2 and CALC-85-E-0118-01)

2.2 IF 2P-32B REVERSE ROTATION (2K11-C4) also in alarm,
THEN check status of fuse F23 in cabinet 2C-21.

2.3 IF EITHER of the following conditions exist:

- RCP (2P-32A) operating
- Fuse F23 in cabinet 2C-21 blown,

THEN alarm is NOT valid.

2.4 IF 2P-32A Reverse Rotation alarm valid,
THEN perform the following:

2.4.1 Secure ALL operating RCPs:

- 2P-32B (2HS-4621)
- 2P-32C (2HS-4720)
- 2P-32D (2HS-4721)

2.4.2 IF RCP (2P-32B) was stopped,
THEN verify B Spray valve (2CV-4652) in MANUAL and closed.

2.4.3 IF CNTMT building accessable,
THEN locally verify RCP (2P-32A) has stopped rotating.

2.4.4 Contact System Engineering and Management for assistance in developing a troubleshooting plan.

(C-2 Continued on next page)

ANNUNCIATOR 2K11

C-2

REVERSE ROTATION
(Continued)

2.4.5 IF recommended by System Engineering and Management, THEN perform the following:

A. Station Operator to locally monitor RCP (2P-32A).

B. Start another RCP using Reactor Coolant Pump Operations (2103.006).

C. IF RCP (2P-32A) pump rotates backwards, THEN perform the following:

1. Secure RCP started:

- 2P-32B (2HS-4621)
- 2P-32C (2HS-4720)
- 2P-32D (2HS-4721)

2. Submit WR/WO.

D. IF RCP (2P-32A) pump remains stationary, THEN perform the following:

1. Start RCP (2P-32A) using Reactor Coolant Pump Operations (2103.006).

2. Monitor Reactor Coolant pump (2P-32A) for abnormal noise, vibration, and temperature trends.

2.5 IF 2P-32A Reverse Rotation alarm malfunctioning, THEN submit WR/WO.

3.0 TO CLEAR ALARM

3.1 Reduce RCP 2P-32A oil flow to value corresponding to reverse speed < 75 RPM.

4.0 REFERENCES

4.1 E-2457-1

JOB PERFORMANCE MEASURE

Unit: 2 **Rev #:** 0 **Date:** ____________

SYSTEM/DUTY AREA: Emergency & Abnormal Operations

TASK: Disable B channel excore nuclear instrumentation.

JTA# ANO2-RO-EOPAOP-OFFNORM-172

ALTENATE PATH YES: ____ NO: X **TIME CRITICAL** YES: ____ NO: X

KA VALUE RO: 3.1 SRO: 3.5 **KA REFERENCE:** 015 A2.02

APPROVED FOR ADMINISTRATION TO: AO: ____ WCO: ____ RO: X SRO: X

TASK LOCATION: INSIDE CR: X OUTSIDE CR: ____ BOTH: ____

SUGGESTED TESTING ENVIRONMENT AND METHOD (PERFORM OR SIMULATE):

PLANT SITE: ____________ **SIMULATOR:** perform **LAB:** ____

POSITION EVALUATED: RO: ____________ SRO: ____________

ACTUAL TESTING ENVIRONMENT: SIMULATOR: ____ PLANT SITE: ____ LAB: ____

Testing Method: Simulate: ________ Perform: ________

APPROXIMATE COMPLETION TIME IN MINUTES: 15 minutes

REFERENCES(S): OP 2203.026 Nuclear Instrument Malfunction Rev. 7

EXAMINEE'S NAME: ____________________ **LOGON ID:** ____________

EVALUATOR'S NAME: ____________________

THE EXAMINEE'S PERFORMANCE WAS EVALUATED AGAINST THE STANDARDS CONTAINED IN THIS JPM AND IS DETERMINED TO BE:

SATISFACTORY: ____________ **UNSATISFACTORY:** ____________

PERFORMANCE CHECKLIST COMMENTS:

____

____

START TIME: ________ **STOP TIME:** ________ **TOTAL TIME:** ________

JOB PERFORMANCE MEASURE

THE EXAMINER SHALL REVIEW THE FOLLOWING WITH THE EXAMINEE:

Verify the examinee has reviewed and been briefed on NUREG 1021 APPENDIX E, Policies and Guidelines for Taking NRC Exams.

INITIAL CONDITIONS:

- The plant is in mode 3.
- CEAs are capable of withdrawal.
- Shutdown bank CEAs are withdrawn for cocked rod protection
- Channel “A” Nuclear Instrument had previously failed and associated RPS channels were placed in bypass.
- Channel “B” Nuclear Instrument has just failed.

SIMULATOR SETUP:

Mode 3, CEAs capable of withdrawl, and Shutdown banks withdrawn for cocked rod protection.
SDBCS in AL 1000# setpoint
Insert malfunction: NIALINEPWR with a value = 0
Bypass bistables 1 thru 4 on RPS channel A.
Insert malfunction: NIBLINEPWR with a value = 200

TASK STANDARD:

Channel B RPS bistables 1 thru 4 are tripped.

TASK PERFORMANCE AIDS:

OP 2203.026 Nuclear Instrument Malfunction Rev. 7

EXAMINER NOTES:

Disable B channel excore nuclear instrumentation. With a NI channel failed and already bypassed, a second NI channel failure will require the examinee to take contingency actions to place the second NI channel in the trip condition placing the RPS trip logic in a one out of two channels to trip the reactor.

JOB PERFORMANCE MEASURE

INITIATING CUE:

The CRS directs you to disable Nuclear Instrument B Log channel using Nuclear Instrument Malfunction OP-2203.026 step 6.

START TIME: ______________________________

		CHECKLISTS	STANDARDS	(Circle One)
	1. (Step 6/6A)	Disable affected log channel as follows: If Three or more channels failed Then enter Tech Spec 3.0.3.	Examinee determined only two Channels are failed and marks step 6.A as N/A.	N/A SAT UNSAT
	2. (Step 6.B)	Verify affected Log Power channel NOT in Trip Channel Bypass at 2C23.	On the PPS ‘B’ Channel. Examinee verified Log Power channel NOT in Trip Channel Bypass at 2C23	N/A SAT UNSAT
PROCEDURE CAUTION Removing “LOG CALIBRATE” switch from operate will initiate Power Trip Test Interlock (PTTI).				
(C)	3. (Step 6.C)	Place associated LOG CALIBRATE switch at 2C23 to position #1.	Examinee placed LOG CALIBRATE switch at 2C23 to position #1 for the ‘B’ Channel.	N/A SAT UNSAT
	4. (Step 6.D)	Check associated High Log Power Operating Bypass OFF light at 2C03 is ON.	Examinee checked High Log Power Operating Bypass OFF light at 2C03 is ON for the ‘B’ Channel.	N/A SAT UNSAT
(C)	5. (Step 6.E)	Place associated LOG CALIBRATE switch at 2C23 to position #6.	Examinee placed LOG CALIBRATE switch at 2C23 to position #6 for the ‘B’ Channel.	N/A SAT UNSAT
	6. (Step 6.F)	Verify High Log Power Operating Bypass maintained in OFF.	On Panel 2C03, examinee verified High Log Power Operating Bypass maintained in OFF on the ‘B’ Channel by verifying High Log Power Operating Bypass OFF light at 2C03 is ON for the ‘B’ Channel.	N/A SAT UNSAT
	7. (Step 6.G)	Check following PPS Bistable Relay Indicating lamps at 2C23 are ON: ▪ Log power {2} ▪ LPD {3} ▪ DNBR {4}	Examinee checked following PPS Bistable Relay Indicating lamps at 2C23 are ON for the ‘B’ Channel: ▪ Log power {2} ▪ LPD {3} ▪ DNBR {4}	N/A SAT UNSAT

(S8)

JOB PERFORMANCE MEASURE

		CHECKLISTS	STANDARDS	(Circle One)
	8. (Step 6.H)	Install clearance on High Log Power Operating Bypass switch at 2C03 to maintain switch in OFF. **<u>Examiner Cue:</u>** **Another operator will take care of this.**	Examinee asked SM/CRS to install clearance on High Log Power Operating Bypass switch at 2C03 to maintain switch in OFF.	N/A SAT UNSAT
END				

STOP TIME: ______________________________

JOB PERFORMANCE MEASURE

EXAMINER'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- The plant is in mode 3.
- CEAs are capable of withdrawal.
- Shutdown bank CEAs are withdrawn for cocked rod protection
- Channel "A" Nuclear Instrument had previously failed and associated RPS channels were placed in bypass.
- Channel "B" Nuclear Instrument has just failed.

INITIATING CUE:

The CRS directs you to disable Nuclear Instrument B Log channel using Nuclear Instrument Malfunction OP-2203.026 step 6.

JOB PERFORMANCE MEASURE

EXAMINEE'S COPY

INITIAL CONDITIONS:

You are responsible for any applicable annunciators during the performance of this task. All annunciators that are not applicable to this task will be performed by another operator.

- The plant is in mode 3.
- CEAs are capable of withdrawal.
- Shutdown bank CEAs are withdrawn for cocked rod protection
- Channel “A” Nuclear Instrument had previously failed and associated RPS channels were placed in bypass.
- Channel “B” Nuclear Instrument has just failed.

INITIATING CUE:

The CRS directs you to disable Nuclear Instrument B Log channel using Nuclear Instrument Malfunction OP-2203.026 step 6.

INSTRUCTIONS	CONTINGENCY ACTIONS

5. GO TO Step 8.

6. Disable affected Log Power channel as follows:

A. IF THREE or more channels failed, THEN refer to TS 3.0.3.

B. Verify affected Log Power channel NOT in Trip Channel Bypass at 2C23.

CAUTION

Removing “LOG CALIBRATE” switch from operate will initiate Power Trip Test Interlock (PTTI).

C. Place associated "LOG CALIBRATE" switch at 2C23 to position #1.

D. Check associated High Log Power Operating Bypass OFF light at 2C03 is ON.

E. Place associated “LOG CALIBRATE" switch at 2C23 to position #6.

F. Verify High Log Power Operating Bypass maintained in OFF.

G. Check following PPS Bistable Relay Indicating lamps at 2C23 are ON:

- Log power {2}
- LPD {3}
- DNBR {4}

H. Install clearance on High Log Power Operating Bypass switch at 2C03 to maintain switch in OFF.

INSTRUCTIONS		CONTINGENCY ACTIONS
7.	**<u>IF</u> in Modes 3, 4 or 5 <u>AND</u> CEAs capable of withdrawal, <u>THEN</u> check at least TWO Log Power channels operable.**	**7. Perform the following:** A. Within 1 hour verify Shutdown Margin requirements of TS 3.1.1.1 or 3.1.1.2 as applicable. B. Verify Shutdown Margin at least once every 12 hours.
8.	**Notify I&C of Nuclear Instrument malfunctions.**	

END

Facility: ANO-2	Scenario #1 (New)	Op-Test No.: 2017-1
Examiners:	Operators:	

Initial Conditions: ~69%, MOL, RED Train Maintenance Week. RWT on recirc.

Turnover:

Reactor power band 68 to 70% for 500KV line maintenance (Mabelvale line). 260 EFPD. EOOS indicates 'Minimal Risk'. RED Train Maintenance Week.

Scheduled evolution: Place the 'B' Component Cooling Water (CCW) pump in service and secure 'C' CCW pump for Maintenance using section 18 of 2104.028, Component Cooling Water System Operations.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Place the 'B' Component Cooling Water (CCW) pump in service and secure 'C' CCW pump. **OP-2104.028, Component Cooling Water System Operations.**
2	CVC2P36CSS	C (ATC) C (SRO)	Charging pump, 2P36C, sheared shaft **OP-2203.036, Loss of Charging AOP.**
3	DI_C40_S73B K04-H01 K07-H01	C (BOP) C (SRO) TS (SRO)	Inadvertent Recirculation Actuation Signal (RAS). **OP-2203.040, Inadvertent RAS AOP.**
4	SEISMIC CV0336	R (ATC) C (BOP) C (SRO) TS (SRO)	Earthquake (Natural emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) pump overspeed trip mechanism fails. **OP-2203.008, Natural Emergencies AOP.**
5	DI_HS_4930_1 CVC2P39ANAS CVC2P39BNAS	C (ATC) C (SRO)	2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically. **OP-2104.003, Chemical Addition**
6	MTGTRIPLOCKO	M (ALL)	Turbine trip causing a reactor trip. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	MFWPMPBTRP EFW2P7BFLT EFWROOMB	M (ALL)	2P-1B Main Feedwater (MFW) pump trip, 2P-7B Emergency Feedwater (EFW) motor fault, causing a loss of Feedwater. **OP-2202.006, Loss of Feedwater EOP**
8	CEA02STUCK CEA07STUCK CV4873	C (ATC) C (SRO)	Control Element Assemblies (CEA's) 2 and 7 will remain withdrawn requiring emergency boration. The Volume Control Tank (VCT) outlet valve will not close. **OP-2202.010 Standard Attachments.**
9	AFW2P75LO	C (BOP) C (SRO)	2P-75 AFW pump trips due loss of lube oil. **OP-2202.006, Loss of Feedwater EOP**

End Point	Feedwater is restored to at least one Steam Generator

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	2
Abnormal Events (2-4)	3
Major Transients (1-2)	2
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	0
Critical Tasks (2-3)	2

Critical Task	Justification	
Commence Emergency boration IAW 2202.010 Standard Attachment Exhibit 1 by the completion of SPTAs.	Meeting the SFSCs prevents core damage and minimizes radiological releases to the environment, ultimately protecting the health and safety of the public. The SFSCs assume that all but one CEA is fully inserted and that the reactor is subcritical by a certain amount (required shutdown margin or SDM).	• CE EPGB Simulator CTs: CT-01, Establish Reactivity Control (SPTA-01) • TS 3.1.1.1 Shutdown margin.
Restore Feedwater prior to both SG levels reaching 70” wide range.	Without feedwater, the SG being steamed will eventually boil dry, RCS heat removal will cease, and the reactor core will begin overheating (core melt potential). Thus, it is essential to steam and feed at least one SG to continue to remove RCS decay heat.	• CE EPGB Simulator CTs: CT-08, Establish RCS Heat Removal (LOAF-02) • EOP 2202.006 Loss of Feedwater EOP • EOP 2202.006 Loss of Feedwater EOP Tech Guide

Scenario #1 Objectives

1) Evaluate individual ability to shift running Component Cooling Water (CCW) pumps
2) Evaluate individual response to a Charging Pump Shaft Shear.
3) Evaluate individual response to a seismic event (Natural Emergencies).
4) Evaluate individual response to an Emergency Feedwater (EFW) pump over speed trip.
5) Evaluate individual response to an Inadvertent Recirculation Actuation Signal (RAS).
6) Evaluate individual and crew's response to a turbine trip.
7) Evaluate individual and crew's ability to restore feedwater using Loss of Feedwater EOP.
8) Evaluate individual response to Control Element Assemblies (CEAs).
9) Evaluate individual response to 2P-75 Auxiliary Feedwater (AFW) pump trips.

Scenario #1 NARRATIVE

Simulator session begins with the plant at ~70% power steady state.

When the crew has completed their control room walk down and brief, the BOP should shift CCW pumps, placing 'B' in service and securing 'C' CCW pump.

After the CCW pumps have been shifted, and cued by lead examiner, Charging pump, 2P-36C, will exhibit signs of a shaft shear. The SRO will enter the Loss of Charging AOP. The ATC will check for a suction source and discharge flow path. The CRS will direct the ATC to isolate letdown and place all charging pumps in stop. The crew will direct a NLO to check for gas binding. No gas binding will be found and the NLO will report that 2P-36C has a shaft shear. The CRS will direct the ATC to restore charging with a backup charging pump then restore letdown. [Site OE: CR-ANO-2-2015-0432, 2P-36A charging pump stopped running, CR-ANO-2-2001-0685, 2P-36C tripped.].

When the crew has restored Charging and Letdown and cued by the lead examiner, an inadvertent Recirculation Actuation Signal (RAS) will occur. The SRO should enter and commence taking action of the Inadvertent RAS AOP. The BOP will override and close the inside CNTMT sump suction isolation valves. The crew will check that Service Water is still aligned to Component Cooling Water (CCW) and Auxiliary Cooling Water (ACW). The SRO should also enter Tech Spec 3.0.3 for CNTMT spray and 3.5.2 for ECCS components. The SRO may have to enter Tech Spec 3.5.4 and TRM 3.1.8 for RWT level. [Industry OE: SEN 268 Invalid Safety Injection with Failure to Reset, Site OE: CR-ANO-2-2013-005 Inadvertent SIAS, CCAS, And CIAS.]

Scenario #1 NARRATIVE (continued)

When the crew has closed the CNTMT sump suction valve and entered the appropriate Tech Specs or at the lead examiner's cue, a seismic event will occur. The crew should determine that an earthquake has occurred and enter the natural emergencies AOP. Emergency Feedwater (EFW) pump 2P-7A trip mechanism fails and cannot be reset. The SRO should enter Tech Spec 3.7.1.2 for (1) Inoperable EFW pump. The crew will verify that the seismic class 2 purification system is isolated from the RWT. They will dispatch NLO to asses the plant for damage. The crew will also commence a shutdown due to exceeding the design basis earthquake. When the ATC starts boration, 2CV-4930 boration valve will fail to automatically open and 2P-39A boric acid makeup (BAM) pump will fail to automatically start. The ATC will manually start the BAM pump and open 2CV-4930 boration valve. [Industry OE: IER L2-12-12 Greater than Design Basis Earthquake results in a Loss of Off-Site Power and Reactor Scram.]

When the crew has commenced a plant shutdown, entered the appropriate Tech Spec or cued by the lead examiner, the turbine will trip. The SRO will direct the reactor to be tripped, due to RCS pressure rising. The Reactor may trip automatically prior to the crew manually tripping the reactor. The SRO should enter and direct the actions of SPTAs. Two CEAs will remain withdrawn and the ATC will commence emergency boration to maintain Shutdown Margin. When EFAS is actuated 2P-7B EFW pump flange will wet the motor and cause a motor fault. 2P-1A MFW pump will trip due to being interlocked with the turbine trip. Also, 2P-1B MFW pump will trip causing a loss of feedwater. The SRO should diagnose and enter Loss of Feedwater EOP. [Site OE: CR-ANO-2-2002-2173, Reactor Trip due to turbine trip. Industry OE: SEN134 Failure of Control Rods to Fully insert.]

The SRO will complete the initial actions of the Loss of Feedwater EOP to conserve inventory, then determine that AFW is the highest prioritized source of feedwater. The BOP will start the AFW pump and it will trip based on a loss of Lube Oil. The crew will transition to the next highest prioritized source of feedwater 2P-1A Main Feedwater pump and restore feedwater using Main Feedwater. [Industry OE: SOER 86-01 Reliability of PWR Auxiliary Feedwater systems]

Simulator Instructions for Scenario 1

Reset simulator to MOL ~69% power IC steady state.

Ensure Mabelvale line out of service BKR5106 and BKR5110 open.

Ensure that AACG is secured and annunciators clear.

Ensure 2P-1A Main Feedwater pump select to trip on Turbine trip.

T6 = OE4R10A1.

T7 = Reactor Trip

T8 = E14R0763

Event No.	Malf. No. / Trigger Number	Value/ Ramp/Time	Event Description
1			Place the 'B' Component Cooling Water (CCW) pump in service and secure 'C' CCW pump. **OP-2104.028, Component Cooling Water System Operations.**
2	CVC2P36CSS Trigger = T1	active	Charging pump, 2P36C, sheared shaft **OP-2203.036, Loss of Charging AOP.**
3	DI_C40_S73B K04-H01 K07-H01 Trigger T2	active on on	Inadvertent Recirculation Actuation Signal (RAS). **OP-2203.040, Inadvertent RAS AOP.**
4	SEISMIC CV0336 Trigger = T3	3/Delete in = 25 sec. 0	Earthquake (Natural emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) pump overspeed trip mechanism fails. **OP-2203.008, Natural Emergencies AOP.**
5	DI_HS_4930_1 CVC2P39ANAS CVC2P39BNAS	active active active	2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically. **OP-2104.003, Chemical Addition**
6	MTGTRIPLOCKO Trigger T4	active	Turbine trip causing a reactor trip. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	MFWPMPBTRP Trigger T5 EFWROOMB EFW2P7BFLT Trigger T6	active / delay = 1 min. active active / delay = 1 min.	2P-1B Main Feedwater (MFW) pump trip, 2P-7B Emergency Feedwater (EFW) motor fault, causing a loss of Feedwater. **OP-2202.006, Loss of Feedwater EOP**
8	CEA02STUCK CEA07STUCK Trigger T7 CV4873	0% 0% 1	CEA's 2 and 7 will remain withdrawn requiring emergency boration. **OP-2202.010 Standard Attachments.**
9	AFW2P75LO Trigger T8	active delay 20 sec.	2P-75 AFW pump trips due loss of lube oil. **OP-2202.006, Loss of Feedwater EOP**

<table>
<tr><th colspan="3">Simulator Instructions for Scenario 1</th></tr>
<tr><td>At T=0</td><td></td><td>Place the ‘B’ Component Cooling Water (CCW) pump in service and secure ‘C’ CCW pump.</td></tr>
<tr><td colspan="3">Cue: When requested as NLO, acknowledge direction to open casing vent for 2P-33B (2CCW-1029) and then report that you had a solid stream of water and 2P-33B (2CCW-1029)has been closed.
Cue: 2P-33B discharge pressure is 110 psig, pump is running satisfactorily.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger = T1</td><td>Charging pump, 2P36C, sheared shaft</td></tr>
<tr><td colspan="3">Cue: When requested as NLO to investigate ‘C’ Charging pump, after the crew has secured ‘C’ Charging pump report that ‘C’ Charging pump has indication of a gear box failure.
Cue: When requested as NLO, acknowledge direction to check for gas binding of charging pump, 2P36C, after 3 minutes report that there are no indications of gas binding.
Cue: When contacted as the WWM, respond that you will contact maintenance to investigate.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger = T2</td><td>Inadvertent Recirculation Actuation Signal (RAS).</td></tr>
<tr><td colspan="3">Cue: When contacted as the WWM, then report that I&C maintenance will investigate the RAS actuation.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger = T3</td><td>Earthquake (Natural emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) pump overspeed trip mechanism fails.</td></tr>
</table>

Simulator Instructions for Scenario 1		
Cue: After the crew has entered the natural emergencies AOP, then call as Unit 1 and report that the K15-C5 Operating Basis Earthquake 0.1G alarm is in. **Cue: If contacted as Unit 1 or an earthquake center report that the earthquake has been validated to be .15G by the National Earthquake Information service or Memphis University Earthquake Information Center.** **Cue: If contacted as Unit 1, then report you have directed I&C to retrieve the seismic event data.** **Cue: If contacted as NLO and sent to investigate EFW pump, 2P-7A, report that the overspeed linkage is damaged and it cannot be reset.** **Cue: If contacted as NLO, then report you will walk down the plant to look damage. No damage will be found other than EFW pump 2P-7A.** **Cue: If contacted as NLO to inspect the spent fuel pool, then report signs of splashing but no damage or leakage noted.** **Cue: When contacted as the WWM, respond that you will contact maintenance to investigate.** **Cue: If asked Door 450 and Door 342 are closed.** **Cue: If contacted to perform the crack mapping surveillance, then report you will get the surveillance started.** **Cue: If requested as RP then acknowledge the request and confirm RP will complete the requested task.** **Cue: If requested as Engineering then acknowledge the request and confirm Engineering will complete the requested task.** **Cue: If requested as WMM, then perform Attachment B, Notifications.**		
		2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.
CUED by Lead Examiner	Trigger = T4	Turbine trip causing a reactor trip.
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.**		
	Reactor Trip and EFW pump start	2P-1B Main Feedwater (MFW) pump trip, 2P-7B Emergency Feedwater (EFW) motor fault, causing a loss of Feedwater.

Simulator Instructions for Scenario 1		
Cue: If contacted as the WCO to investigate 2P-7B, report that 2P-7B discharge flange has a small leak that appears to have sprayed on the motor and the motor has black flash mark near the motor vents. If requested, to quantify the leak report that it is a small trickle. **Cue: If requested to isolate the leak after 5 min report the leak was isolated by closing. 2EFW-4B and 2EFW-3B, after an additional five min remove the malfunction EFWROOMB for 2P-7B room level alarm.** **Cue: If contacted as a NLO to investigate 2P-1B, report that the thrust bearing is extremely hot to the touch.** **Cue: If contacted as a NLO to investigate 2P-1A, report that 'A' Main Feedwater pump has no abnormal indications.** **Cue: When contacted as a NLO to close the LTOP relief isolation valves, after 2 min have the booth operator close the LTOP breakers, then report the 2B51-E4, and 2B51-K2 are closed.**		
	Reactor Trip	CEA's 2 and 7 will remain withdrawn requiring emergency boration.
	AFW pump start	2P-75 AFW pump trips due loss of lube oil.
Cue: If contacted as a NLO to investigate 2P-75, report that there is a large lube oil leak and 2P-75 is no longer running.		

Op-Test No.: 2017-1	Scenario #1	Event No: 1
Event Description: Place the 'B' Component Cooling Water (CCW) pump in service and secure 'C' CCW pump.		

Time	Position	Applicant's Actions or Behavior
		2104.028, Component Cooling Water System Operations
		NOTE • Low CCW flow and pressure alarms can monetarily occur during pump swaps due to check valve and/or pressure control valve repositioning. (Per System Engineer) (CR-ANO-2-2007-0603) • Swapping CCW pumps with loops cross tied changes Surge Tank levels.
	BOP	18.2 CCW PUMP SWAP 18.2.1 Perform the following to START (2P-33B) and STOP (2P-33C): A. Throttle open 2P-33B Casing Vent (2CCW-1029). B. WHEN solid stream of water appears, THEN close 2P-33B Casing Vent (2CCW-1029). C. Place 2P-33B handswitch (2HS-5228) to START. D. Place 2P-33C handswitch (2HS-5234) to STOP. E. Observe the following: • Normal flow 1000 to 3000 gpm (2FIS-5202) • 2P-33B discharge pressure 100 to 120 psig (2PI-5228) F. IF 2P-33C removed from service for maintenance, THEN place 2P-33C handswitch (2HS-5234) in PTL.
		Cue: When requested as NLO, acknowledge direction to open casing vent for 2P-33B (2CCW-1029) and then report that you had a solid stream of water and 2P-33B (2CCW-1029) has been closed. **Cue: 2P-33B discharge pressure is 110 psig, pump is running satisfactorily.**
		Termination criteria: 2P-33C handswitch 2HS-5234 placed in PTL or at lead examiner's discretion.

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce alarms: • 2K12-B3 “HEADER FLOW LO” • 2K12-F3 “PUMP C OIL PRESS LO” • 2K12-B2 “HEADER PRESS LO” **Reports 0 gpm charging header flow and lowering discharge pressure.**
		Enter and implement AOP 2203.036, Loss of Charging
	ATC	*1. **IF** ALL of the following conditions exist: • Plant in Modes 1 or 2 • Charging can **NOT** be restored • PZR level can **NOT** be maintained within 10% of setpoint **THEN PERFORM** the following: A. **TRIP** Reactor. B. **GO TO** 2202.001, Standard Post Trip Actions. **Examiner Note: This step is NA**
	ATC	2. **CHECK** Charging flow path as follows: • Suction source aligned to AY of the following: - VCT - RWT - BAMT • Charging Header Isolation valve (2CV-4840-2) open.
	ATC	3. **IF** lead Charging pump STOPPED **AND** green indicating light OFF, **THEN RESTORE** charging by performing the following: **Examiner Note: This step is NA**

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
<u>NOTE</u> Erratic Charging Pump Discharge pressure and flow may indicate gas binding.		
	ATC	4. **CHECK** for adequate Charging pump operation as follows: • Charging header flow 28 to 45 gpm. • Charging Pump Discharge header pressure greater than RCS pressure • Charging Pump Discharge pressure stable. • Charging pump flow stable. • **<u>IF</u>** Charging flow less than 40 gpm, **<u>THEN</u> REFER TO:** - TRM 3.1.1, Flowpaths - TRM 3.1.2, Flowpaths - TRM 3.1.3, Charging pump - TRM 3.1.4, Charging pump - TRM 3.10.2, FLEX - Unit 1 TRO 3.10.2, FLEX Equipment - Unit 1 TRO 3.10.3, FLEX Connections **Examiner note: Charging header flow and pressure will not meet stated conditions, go to Contingency Actions.**
Cue: When requested as NLO to investigate ‘C’ Charging pump, after the crew has secured ‘C’ Charging pump report that ‘C’ Charging pump has indication of a gear box failure.		

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
	ATC	**Perform Step 4 contingencies -** 4. **IF** Charging pump operation NOT adequate, **THEN PERFORM** the following: A. **CLOSE** at least ONE Letdown Isolation valve by placing valve handswitch in CLOSE position: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred)
	ATC	B. **PLACE** ALL Charging pump handswitchs in stop.
	ATC	C. **CLOSE** Charging Header Isolation valve (2CV-4840-2).
	ATC	D. **ENSURE** VCT Outlet valve (2CV-4873-1) closed by placing valve handswitch in CLOSE position.
	ATC	E. **ENSURE** Emergency Borate valve (2CV-4916-2) closed.
	ATC	F. **ENSURE** Gravity Feed Isolation valves closed: • 2CV-4920-1 • 2CV-4921-1
	ATC	G. **ENSURE** RWT to Charging pump Suction valve (2CV-4950-2) closed by placing valve handswitch in CLOSE position.
	SRO	H. **REFER TO** the following Technical Requirements: • 3.1.1, Flowpaths • 3.1.2, Flowpaths • 3.1.3, Charging pump • 3.1.4, Charging pump • TRM 3.10.2, FLEX • Unit 1 TRO 3.10.2, FLEX Equipment • Unit 1 TRO 3.10.3, FLEX Connections

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
	ATC	5. **CHECK** for indications of Charging header rupture: • VCT level drop. • Aux Building radiation level rise. • CNTMT radiation level rise. • Waste Tanks 2T20A/B level rise. • CNTMT Sump level rise. • Aux Building sump level rise.
	ATC	**Perform Step 5 contingencies –** **IF** indications of Charging Header rupture **NOT** present, **THEN GO TO** Step 10.
	ANY	10. **ENSURE** AFFECTED Charging pump locally checked for gas binding using Attachment A, Charging Pump Venting.
Cue: When requested as NLO, acknowledge direction to check for gas binding of charging pump, 2P36C, after 3 minutes report that there are no indications of gas binding. **Cue: When contacted as the WWM, respond that you will contact maintenance to investigate.**		
	ATC	11. **IF** Charging pump **NOT** gas bound, **THEN** GO TO Step 18.

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
	ATC	18. **RESTORE** Charging and Letdown as follows: A. **ENSURE** Charging Pump Header isolation valve (2CV-4840-2) open. B. **ENSURE** VCT Outlet valve (2CV-4873-1) open. C. **ENSURE** RWT to Charging Pump Suction valve (2CV-4950-2) closed. D. **ENSURE** at least ONE Charging pump running: • 2P-36A • 2P-36B • 2P-36C 1) **RECORD** charging header data using 2202.010, Attachment 44, Charging Header Data.
	ATC	E. **CHECK** for adequate Charging pump operation as follows: • Charging header flow 28 to 45 gpm. • Charging Pump Discharge header pressure greater than RCS pressure. • Charging Pump Discharge pressure stable. • Charging Pump flow stable. • **<u>IF</u>** Charging flow less than 40 gpm, **<u>THEN</u> REFER TO**: **Examiner Note: Charging Header flow and pressure will meet the stated conditions.**
	ATC	F. **ENSURE** the following valve handswitches in AUTO: • 2CV-4873-1 • 2CV-4950-2 G. **RESTORE** Letdown using 2202.010, Attachment 59, Letdown Restoration. H. **ENSURE** required steps of Attachment B, Follow Up Actions complete. I. **EXIT** this procedure.

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
Performs 2202.010, Attachment 59, Letdown Restoration		
	ATC	1. IF Letdown Flow controller (2HIC-4817) NOT in MANUAL, THEN transfer to MANUAL. 2. Using Letdown Flow controller (2HIC-4817), close Letdown Flow Control valves: • 2CV-4816 • 2CV-4817 3. Verify Letdown Pressure controller (2PIC 4812) in MANUAL.
	ATC	4. Verify 2HS-4812 selected to desired valve(s) to be placed in service: • 2CV-4810 • 2CV-4811 • BOTH
	ATC	5. Verify valve(s) selected on 2HS-4812 (2CV-4810/2CV-4811) fully open using 2PIC-4812. 6. Verify Letdown Isolation 2CV-4820 2 (2HS-4820 2) open AND in AUTO. 7. Verify Regen Hx Inlet 2CV-4821-1 (2HS-4821-1) open. 8. Verify Letdown Regen Hx Outlet valve 2CV-4823-2 (2HS-4823-2) open.
NOTE If LD/DI 2T-36A/B, 2T-70 Inlet/Bypass (2CV-4803 has been actuated it must be taken to BYPASS and then back to AUTO/ION EXCH to restore flow through the Ion Exch.		
	ATC	9. Verify LD/DI 2T-36A/B, 2T-70 Inlet/Bypass (2CV-4803) hand switch (2HS-4803) in AUTO/ION EXCH.

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
	ATC	10. Verify at least ONE Charging pump running: • 2P-36A • 2P-36B • 2P-36C 11. Verify Letdown Rad Monitor Isolation (2CV-4804) open.
		CAUTION High Pressure Letdown Relief valve (2PSV-4822) lifts at 600 psia
	ATC	12. Verify 2HS-4817 selected to desired valve(s) to be placed in service: • 2CV-4816 • 2CV-4817 • BOTH 13. Using Letdown Flow controller (2HIC-4817), slowly open 2CV-4816/2CV-4817 to initiate flow.
	ATC	14. Using Letdown Pressure controller (2PIC-4812), slowly close 2CV-4810/2CV-4811 to establish desired pressure: • IF RCS pressure greater than 450 psia, THEN maintain L/D backpressure (2PIC-4812) at setpoint (normal setpoint is 350 psig).

Op-Test No.: 2017-1	Scenario #1	Event No: 2
Event Description: Charging pump, 2P36C, sheared shaft		

Time	Position	Applicant's Actions or Behavior
	ATC	15. WHEN letdown pressure at desired setpoint, THEN Letdown Pressure controller (2PIC-4812) may be placed in AUTO. 16. Using Letdown Flow controller (2HIC-4817), manually adjust 2CV-4816/2CV-4817 position to maintain desired pressurizer level. 17. Check L/D backpressure controller (2PIC-4812) maintained at setpoint. 18. WHEN Letdown Flow controller (2HIC-4817) MANUAL and AUTO signals matched, THEN place 2HIC-4817 in AUTO. 19. Establish 0.5 to 1.5 gpm flow through Rad Monitor Flow Indicator (2FIS-4807) using Letdown Line Radiation Monitor Flow Control section of 2104.002, Chemical and Volume Control.

Termination criteria: After Charging and Letdown have been restored or at lead examiner's discretion.

<table>
<tr><td colspan="3">Op-Test No.: 2017-1 Scenario #1 Event No: 3

Event Description: Inadvertent Recirculation Actuation Signal (RAS).</td></tr>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td>Cued by Lead Examiner</td><td>ANY</td><td>Announce alarms:
• "RAS ACT" (2K04-H1/2K07-H1) in alarm.
• CNTMT SUMP LEVEL HI (2K10-B7)</td></tr>
<tr><td colspan="3">Enter and implement AOP 2203.040, Inadvertent RAS</td></tr>
<tr><td colspan="3"><u>NOTE</u>
Steps marked with (*) are continuous steps.</td></tr>
<tr><td></td><td>ANY</td><td>*1. CHECK Reactor NOT tripped.</td></tr>
<tr><td></td><td>ANY</td><td>2. CHECK SIAS NOT present.</td></tr>
<tr><td></td><td>ANY</td><td>3. CHECK CSAS NOT present.</td></tr>
<tr><td></td><td>BOP</td><td>4. CLOSE the following CNTMT Sump Suction valves by placing handswitch in RAS OVRD:
<table><tr><th>TRAIN A</th><th>TRAIN B</th></tr><tr><td>2CV-5647-1</td><td>2CV-5648-2</td></tr></table></td></tr>
<tr><td></td><td>SRO</td><td>A. REFER TO the following:
• TS 3.5.2 or 3.5.3 for HPSI/LPSI
• TS 3.0.3 for Containment Spray

Examiner Note: SRO must enter TS 3.5.2, action c. for HPSI and LPSI and TS 3.0.3 for Containment Spray.</td></tr>
</table>

Op-Test No.: 2017-1	Scenario #1	Event No: 3
Event Description: Inadvertent Recirculation Actuation Signal (RAS).		

Time	Position	Applicant's Actions or Behavior
	BOP	5. **PERFORM** the following for ESF pumps: A. **IF** suction sources isolated for Red Train ESF pumps (RWT AND CNTMT Sump), **THEN ENSURE** the following in PTL: • HPSI pump 2P89A • HPSI pump 2P89C (Red Train) • LPSI pump 2P60A • CNTMT Spray pump 2P35A
	BOP	B. **IF** suction sources isolated for Green Train ESF pumps (RWT AND CNTMT Sump), **THEN ENSURE** the following in PTL: • HPSI pump 2P89B • HPSI pump 2P89C (Green Train) • LPSI pump 2P60B • CNTMT Spray pump 2P35B
	SRO	C. **REFER TO** the following Tech Specs: • 3.5.2 • 3.5.3 • 3.6.2.1 • 3.0.3 **Examiner Note: SRO must enter TS 3.5.2, action c. for HPSI and LPSI and TS 3.0.3 for Containment Spray.**
	ANY	6. **CHECK** the following: A. SW aligned to CCW. B. SW aligned to ACW.

Op-Test No.: 2017-1	Scenario #1	Event No: 3
Event Description: Inadvertent Red train Recirculation Actuation Signal (RAS) due to a relay failure.		

NOTE

IF SW MOVs are overridden after an actuation, then the associated SW loop is considered inoperable. If MOVs are overridden on both SW loops, then both SW loops are considered inoperable.

	SRO	7. **IF** SW MOVs were overridden, **THEN EVALUTE** SW operability as follows: A. **IF** SW MOVs on BOTH SW headers overridden, **THEN PERFORM** the following: B. **IF** SW MOVs on only ONE SW header overridden, **THEN PERFORM** the following: C. **REFER TO** Attachment B, Tech Spec and TRM Evaluation due to inoperable SW loop(s). **Examiner Note: No service water valves were overridden.**
	ANY	8. **CHECK** SIAS or MSIS actuated.
	SRO	**8. IF MSIS or SIAS NOT actuated, THEN GO TO Step 9.**
	ANY	*9. Maintain SW Header pressure greater than 85 psig.
	SRO	10. **ENSURE** TS/TRM reviewed for applicability per Attachment B, Tech Spec and TRM Evaluation.
	ANY	11. **NOTIFY** I&C to determine and correct problem.

Cue: When contacted as the WWM, then report that I&C maintenance will investigate the RAS actuation.

Termination Criteria: When the sump valves are overridden and the SRO has entered the appropriate TS or at the discretion of the Lead Examiner.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Determine that a seismic event has occurred from tank levels oscillating, alarms, and sounds.
		Enter and implement Natural Emergencies AOP, 2203.008.
		Cue: After the crew has entered 2203.008, Natural Emergencies, then call as Unit 1 and report that the K15-C5 Operating Basis Earthquake 0.1G alarm is in.
		NOTE Steps marked with (*) are continuous actions steps
	SRO	*1. IF Reactor trip occurs, THEN perform the following: A. Perform 2202.001, Standard Post Trip Actions. B. WHEN Standard Post Trip Actions completed, THEN perform applicable actions of this procedure in conjunction with appropriate EOP.
	SRO	2. Notify Unit 1 Control Room of entry into Natural Emergencies AOP.
	SRO	3. Refer to 1903.010, Emergency Action Level Classification. 4. Initiate evaluation of plant risk in accordance with the following: • IF in Modes 1 through 4, THEN use COPD-024, Risk Assessment Guidelines. **Examiner note: The SRO should normally have the STA or SM perform these tasks.**
	SRO	6. Perform appropriate section based on type of emergency: A. IF seismic event occurred, THEN **GO TO** Section 2, Seismic Event.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
NOTE • National Earthquake Information Service, Denver, CO. Phone No, 1-800-525-7648. If no answer, call 1-303-273-8500, 1-303-2738427 or 1-303-273-8428 • Memphis University Earthquake Information Center telephone number 1-901-678-2007. If no answer, call Shelby County Emergency Management Agency at 1-901-458-1515.		
Cue: If contacted as Unit 1 or an earthquake center report that the earthquake has been validated to be .15G by the National Earthquake Information service or Memphis University Earthquake Information Center.		
	SRO	1. Refer to 1903.010, Emergency Action Level Classification. A. IF BOTH of the following conditions exist: • Physical symptoms of an earthquake were experienced. • Notified by Unit 1 that Seismic Monitoring incapable of alarming. THEN declare a Notification of Unusual Event. **Examiner Note: This step will be performed by the SM.**
	ANY	2. IF Refueling Water Tank on Spent Fuel Pool purification, THEN close RWT Recirculation Isolation Valves: • 2CV-5637-1 • 2CV-5638-2 **Examiner Note: BOP will verify these valves closed.**
	ANY	3. Coordinate with Unit 1 to retrieve seismic event data in accordance with 1203.025, Natural Emergencies.
Cue: If contacted as Unit 1, then report you have directed I&C to retrieve the seismic event data.		
	SRO	4. Evaluate the need to call out additional personnel for support.

Op-Test No.: 2017-1 Scenario #1 Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	SRO	5. Locally perform visual inspection to determine equipment or structural damage.
Cue: If contacted as NLO, then report you will walk down the plant to look damage. No damage will be found other than EFW pump 2P-7A. **Cue: If contacted as NLO to inspect the spent fuel pool, then report signs of splashing but no damage or leakage noted.**		
	SRO	*6. Verify proper operation of systems started after earthquake.
	ANY	*7. Perform heightened monitoring of the following for indication of system damage: A. Sump pump operation AND associated alarms B. Tank levels AND associated alarms C. RCS leakrate
	ANY	8. <u>IF</u> damaged equipment found, <u>THEN</u> secure damaged equipment using associated operating procedure.
	ANY	Announce 2K05-A9, 2P7A TURB OVERSPEED TRIP, is alarming. **Examiner Note: SRO must enter LCO 3.7.1.2, action b. Turbine Driven EFW is Inoperable.**
Cue: If contacted as NLO and sent to investigate EFW pump, 2P-7A, report that the overspeed linkage is damaged and it cannot be reset. **Cue: When contacted as the WWM, respond that you will contact maintenance to investigate.**		
	ANY	9. Close BOTH of the following: • Unit 2 S/M office (Door 450) • Unit 2 Control Room Foyer (Door 342)
Cue: If asked Door 450 and Door 342 are closed.		

Op-Test No.: 2017-1 Scenario #1 Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	SRO	10. Contact Planning and Scheduling to perform 2306.010, Spent Fuel Pool Crack Mapping and Visual Inspection surveillance within 24 hours. **Examiner Note: This step will be performed by the SM.**
Cue: If contacted to perform the crack mapping surveillance, then report you will get the surveillance started.		
	SRO	11. Perform 2203.052, Dry Fuel Storage Emergencies in conjunction with this procedure. **Examiner Note: The Dry Fuel Storage Emergencies AOP directs the SRO to notify RP to survey the area and Reactor Engineering to inspect the Dry Fuel Storage Casks.**
Cue: If requested as RP then acknowledge the request and confirm RP will complete the requested task. **Cue: If requested as Engineering then acknowledge the request and confirm Engineering will complete the requested task.**		
	SRO	12. Refer to the following: A. TRM 3.3.3, Seismic Instrumentation B. TS 3.7.12, Spent Fuel Structural Integrity
	SRO	13. IF earthquake of > 0.1g suspected or validated, THEN secure any fuel handling activities in progress.
	ANY	14. IF earthquake of ≥ 0.1g validated AND plant is above Mode 3, THEN perform the following: A. Refer to applicable reactivity plan. B. Commence plant shutdown to Mode 3 using EITHER of the following: • 2102.004, Power Operation • 2203.053, Rapid Power Reduction

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ANY	15. IF earthquake of ≥ 0.01g is validated or there is clearly earthquake related damage to the plant, THEN notify engineering to perform the following: • Post-Earthquake Inspection Procedure (EN-DC-356) • CALC-ANOC-CS-13-00006 (contains listing of equipment requiring inspection)
	ANY	16. Initiate Condition Report.
	ANY	*17. Continue recovery actions as directed by Operations Management.

- **If 2203.053, Rapid Power Reduction is entered continue below.**
- **If 2102.004, Power Operation starts on page 30.**

Enter 2203.053 Rapid Power Reduction.

NOTE

- This procedure was created in response to CR-ANO-C-2014-1142 CA 17 and designated as a CAPR by CR-ANO-C-2014-1142 CA 56.
- Use of this procedure may be terminated at any point if a complete shutdown is not required.
- Shutdown rate shall be based on plant conditions and safety considerations. Rate may be raised or lowered as plant conditions warrant.

Time	Position	Applicant's Actions or Behavior
	SRO	*1. IF at any time, it is determined that significant manual actions are required to EITHER maintain the plant online, OR maintain the desired maneuvering rate, THEN perform the following: A. Trip the Reactor. B. GO TO 2202.001, Standard Post Trip Actions.

NOTE

If Emergency Boration in progress, changing the number of running Charging pumps will change Boration rate.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ALL	2. Commence Power reduction using appropriate reactivity plan. *A. Operate Charging and Letdown as necessary during power reduction. **Examiner Note: Normal Boration steps, 2104.003, Chemical Addition (Exhibit 3) can be found starting on page 25.**

NOTE

The CBOT is the preferred RO to lower turbine load so that the ATC can focus on primary plant control. However, either individual can operate the turbine as plant conditions dictate.

Time	Position	Applicant's Actions or Behavior
	BOP	* 3. Lower Turbine load as necessary to hold Tave within ± 3°F of program Tref.

NOTE

- CEAs should not be inserted below 80 inches withdrawn when the Reactor is at power and the CPC Aux trip is active. ASI would tend to shift back to the top of the core if CEAs are inserted more than halfway.
- At higher power levels, larger (more aggressive) CEA insertions may be required (6 to 8 inches recommended initially).
- ASI response to power changes at the end of core life is more severe, at times significantly so. The effects of ASI may not be seen until well into the power change.
- Proactively driving ASI more positive than ESI (up to +0.05 deviation) will improve the ability to control ASI at lower power levels.
- Exceeding COLR ASI limit will challenge CPC QASI Aux Trip setpoint and may result in automatic trip. CPC QASI Aux Trip occurs at ±0.45 (PID 187).

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ALL	* 4. Perform the following for ASI: • Maintain ASI within Core Operating Limits Report (COLR) limits using CEA Group 6 or Group P. • Use ONE of the following to monitor ASI closely: - COLSS (CV9198) - IF COLSS inoperable, THEN use CPC channel ASI (PID 268) that most closely agreed with COLSS when it was operable. • Periodically monitor QASI (PID 187). • Insert Group 6 (preferred at higher power) OR Group P CEAS (preferred at lower power) using Exhibit 3 of 2105.009, CEDM Control System Operation, as necessary. **Examiner Note: CEDM Control System Operation (exhibit 3) can be found on page 28.**
	BOP	*5. IF desired to transfer unit auxiliaries from Unit Aux transformer to SU #3 THEN perform Attachment A, Transferring Loads to SU #3.
	BOP	*6 Throttle Condensate recircs as necessary to maintain 650-750 psig Condensate Pump Discharge pressure: • 2CV-0662 (2FIC-0662) • 2CV-0663 (2FIC-0663)
	BOP	7. Perform notifications of power reduction using Attachment B, Notifications.
Cue: If requested as WMM, then perform Attachment B, Notifications.		
	ANY	*8. Monitor Secondary chemistry and adjust chemical feed as needed using 2106.028, Secondary System Chemical Addition.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
		OP-2104.003, Chemical Addition Exhibit 3 (Normal Boration).
R A P		CAUTION The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R3.
	ATC	1.0 IF a Reactivity Management Brief has NOT been conducted, THEN perform a Reactivity Management Brief per COPD-030 with an SRO. 2.0 IF this is the first Boration of the shift, THEN verify BAM Flow totalizer (2FQI-4926) reset. 3.0 IF desired, THEN record initial controller data: 2FIC-4926 Setpoint: _______ Demand: _______ 4.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: • Setpoint set to desired flow rate. • IF in MANUAL, THEN demand set to desired value.
	ATC	5.0 Verify desired BAM pump (2P-39A OR 2P-39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2). 6.0 Place Mode Select switch (2HS-4928) to BORATE.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ATC	7.0 Verify Charging Pump Suction From Boric Acid (2CV-4930) opens (2HS-4930). **(2CV-4930 will not automatically open and the applicant should open it using the HS)** 8.0 Verify selected BAM pump running: **(The BAM pump(s) will not automatically start and the applicant should start it using the HS)** • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2) *9.0 Verify BAM Tank Recirc open for running pumps: • 2T-6A recirc (2HS-4903-2) • 2T-6B recirc (2HS-4915-2) *10.0 <u>IF</u> additional boric acid flow required, <u>THEN</u> manually start additional BAM pump: • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2)

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ATC	**CRITICAL STEP** 11.0 Operate Boric Acid Makeup Flow Batch controller (2FQIS-4926) as follows: 11.1 Depress AND hold red pushbutton. 11.2 Verify Boric Acid Makeup Flow Batch controller (2FQIS-4926) set for desired quantity. 11.3 Release Red pushbutton. 12.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) indicates desired flow rate.
	ATC	*13.0 Perform the following to Start/Stop additional Charging pumps: 13.1 IF desired to raise flow, THEN perform the following: A. Start additional charging pumps as necessary. B. Adjust Boric Acid Makeup Flow controller (2FIC-4926) to desired flow rate. 13.2 IF desired to lower flow, THEN perform the following: A. Adjust Boric Acid Makeup Flow controller (2FIC-4926) to desired flow rate. B. Secure additional Charging Pumps as necessary.

Op-Test No.: 2017-1 Scenario #1 Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ATC	*14.0 Monitor the following parameters: • RCS T_{AVE} • Axial Shape Index • Reactor power **CRITICAL STEP** 16.0 WHEN Boric Acid Makeup Flow Batch controller (2FQIS-4926) at zero, THEN verify the following: • Boric Acid Makeup Flow Control (2CV-4926) closes. • No flow indicated on Boric Acid Makeup Flow controller (2FIC-4926).

Enter 2105.009, CEDM Control System Operation (CEDMCs Operations, Exhibit 3)

NOTE

- "CEA SELECTED" indicates selected CEA position.
- "GROUP SELECTED" indicates average position of selected group.
- Rod motion is inhibited by PMS CEA sequencing program if a deviation of six inches occurs in any regulating group.
- CEAC CH1 and CH2 annunciators on 2K04 and CEDMCS annunciators on 2K10 should be checked for applicability prior to moving CEAs.

R A P

CAUTION

The following section has a Reactivity Addition Potential (RAP) and is classified as Risk Level R2.
For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030, Reactivity Management Program.

Op-Test No.: 2017-1	Scenario #1	Event No: 4 & 5

Event Description:

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	SRO	1.0 **IF** time allows **AND** Reactivity Management Brief has **NOT** been conducted, **THEN PERFORM** a Reactivity Management Brief per COPD-030 with an SRO.
	ATC	2.0 **IF** moving CEAs in group, **THEN**: 2.1 **ENSURE** Group Select switch to desired group position. 2.2 **IF** moving Group P CEAs, **THEN PLACE** P Group Select switch to P. 2.3 **ENSURE** Individual CEA Selection switches aligned to CEA in group selected to move. 2.4 **PLACE** Mode Select switch to MANUAL GROUP (MG) or MANUAL SEQUENTIAL (MS). * 2.5 **OBSERVE** CEAC and Pulse Counter CEA position indications to ensure CEA motion and alignment as CEAs are moved. RAP 2.6 **POSITION** groups as desired using Manual Control lever. 2.7 **PLACE** Mode Select switch to OFF. 2.8 **ENSURE** Pulse Counter and CEAC indications match.

Enter 2102.004, Section 12 (Emergent Power Reduction) of Power Operation.

<table>
<tr><td colspan="3">Op-Test No.: 2017-1 Scenario #1 Event No: 4 & 5

Event Description:
• Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
• 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.</td></tr>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td colspan="3">R A P
<u>CAUTION</u>
The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R1.
For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030.</td></tr>
<tr><td></td><td>SRO</td><td>12.1 <u>IF</u> time allows <u>AND</u> Reactivity Management Brief has <u>NOT</u> been conducted, <u>THEN</u> perform a Reactivity Management Brief per COPD-030 with an SRO.</td></tr>
<tr><td colspan="3"><u>NOTE</u>
• Plant parameters may be monitored using Exhibit 2, Various Parameters Vs Reactor Power.
• Boron adjustment data for power change may be obtained from Reactivity curves located in Plant Data book.</td></tr>
<tr><td></td><td>SRO</td><td>12.2 <u>IF</u> plant must be off-line within one hour,
<u>THEN</u> refer to Attachment H, Rapid Power Reduction.

Examiner Note: This step should be NA.</td></tr>
<tr><td colspan="3"><u>NOTE</u>
• Initially, only enough boric acid should be added to reduce power by a few percent (less than 5%). As power lowers, Xenon will start to peak causing power to drop faster. Dilution may be required to slow power reduction rate.
• If one BAM Tank is out of service for Acid Reducing Chemistry, depletion of on-line BAMT during power reduction may result in TRM 3.1.8 entry.</td></tr>
</table>

Op-Test No.: 2017-1 Scenario #1 Event No: 4 & 5

Event Description**:**

- Earthquake (Natural Emergencies AOP) that requires a shutdown (>.1g) and 2P-7A Emergency Feedwater (EFW) Pump overspeed trip mechanism fails.
- 2CV-4930 boration valve fails to automatically open and 2P-39A and 2P-39B boric acid makeup pumps fail to start automatically.

Time	Position	Applicant's Actions or Behavior
	ANY	**CRITICAL STEP** 12.3 Commence Power reduction by performing the following as necessary: • Boration using Normal Borate Mode to Charging pump suction (unless directed otherwise by Abnormal Operating Procedure). Refer to Chemical Addition (2104.003), Exhibit 3, Normal RCS Boration at Power. • Boration from RWT or BAMT using Chemical Addition (2104.003), Attachment R, RCS Boration From The RWT or BAMT. • CEA insertion using CEDMCS Control System Operation (2105.009), Exhibit 3 CEDMCS Operations (normally for ASI control). **Examiner Notes:** • **Boration should be ~ 800 gallons at 13 gpm per the 2 hour Reactivity Plan** • **Boration steps (2104.003, Exhibit 3) are found on page 24** • **CEDMCS steps (2105.009, Exhibit 3) are found on page 27.**
	BOP	*12.4 Lower Turbine load as necessary to hold Tave within ± 2°F of program Tref using Exhibit 1, T_{AVE} VS T_{REF}. 12.4.1 IF desired to stop Turbine load OR Power reduction, THEN perform the following as necessary: A. Secure RCS Boration using Chemical Addition (2104.003). B. Commence RCS dilution using Chemical Addition (2104.003).

Termination Criteria: When the required reactivity manipulation is complete or at lead examiner's discretion.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Numerous alarms indicating a Main Turbine trip. **Examiner Note: Reactor will trip in ~ 10 seconds on High Pressurizer pressure.**
	SRO	Direct tripping the reactor due to the loss of the Main Turbine.
Enter and implement EOP 2202.001, Standard Post Trip Actions.		
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required. 2. Open Safety Function Tracking page.
Reactivity Control Safety Function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. Check startup rate is negative. C. ALL CEAs fully inserted by observing ANY of the following: **(CEAs 2 & 7 do not insert - perform contingency)** 1) CEA Rod bottom lights illuminated. 2) CEAC 1 indicates ALL CEAs fully inserted. 3) CEAC 2 indicates ALL CEAs fully inserted. **C. Verify emergency boration in progress using Exhibit 1, Emergency Boration**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Performs 2202.010, Standard Attachments (Exhibit 1) Emergency Boration		
Exhibit 1 Boration	ATC	1. Select ONE of the following Emergency Boration flowpaths: **FLOWPATH** / **ACTIONS REQUIRED** A. Gravity Feed — A. Verify at least ONE BAM Tank Gravity Feed valve open: • 2CV-4920-1 • 2CV-4921-1 B. BAM pumps — B. 1) Start at least ONE BAM pump. 2) Open Emergency Borate valve (2CV-4916-2). 3) Verify Boric Acid Makeup Flow Control valve CV-4926) closed.

CAUTION

Aligning Charging pump suction to RWT during RWT purification with ALL Charging pumps running may cause Charging pumps to trip due to low suction pressure.

Time	Position	Applicant's Actions or Behavior
		C. RWT to Charging pumps — C. Open Charging Pump Suction Source From RWT valve (2CV-4950-2).
		2. Close VCT Outlet valve (2CV-4873-1). **Examiner Note: VCT Outlet valve (2CV-4873-1) does not close, flowpath B (BAM pumps) must be selected.**
		3. IF VCT Outlet valve does NOT close, THEN verify BAM Pumps Emergency Boration flowpath selected.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
	ATC	4. Verify Reactor Makeup Water Flow Control valve (2CV-4927) closed.
		5. Verify at least ONE Charging pump running.
Exhibit 1 Boration		6. Verify charging header flow greater than 40 gpm by either of the following: • 2FIS-4863 Disch Flow (2C09) • Computer Point F4863 (PDS, PMS or SPDS)

Critical Task: Commence Emergency boration IAW 2202.010 Standard Attachment Exhibit 1 by the completion of SPTAs.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries Safety Function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Check Main Turbine tripped by BOTH of the following: • ALL Main Stop Valves closed. • Generator megawatts indicate zero. B. Generator Output breakers open. C. Perform EITHER of the following as required: 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462 D. At least ONE 6900v AC bus energized. E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized G. BOTH DGs secured. H. At least ONE 125v Vital DC bus energized: • 2D01 - SPDS point E2D01 • 2D02 - SPDS point E2D02

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
RCS Inventory Control Safety Function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. B. RCS MTS 30°F or greater.
RCS Pressure Control Safety Function	ATC	6. Check RCS Pressure Control: • 1800 to 2250 psia. • Trending to setpoint. • Normal PZR Spray and heaters controlling pressure. • Valid CNTMT Spray NOT in progress.
Core Heat Removal safety Function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. B. CCW flow aligned to RCPs. C. Loop delta T less than 10°F. D. RCS MTS 30°F or greater. E. Check SW aligned to CCW. F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ANY	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level. **(NOT met)** **A. Contingency Actions** **1) <u>IF</u> SG level lowering <u>THEN</u> verify EFAS actuated.** **2) <u>IF</u> SG level less than 10% <u>THEN</u> verify total flow greater than 485 gpm** **4) <u>IF</u> FW <u>NOT</u> maintaining SG level, <u>THEN</u> manually control FW flow rate.** **5) <u>IF</u> FW <u>NOT</u> available <u>THEN</u> perform the following:** **a) Verify maximum of ONE RCP running in each loop.** **b) <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.** **• RCP A Spray Valve (2CV-4651)** **• RCP B Spray Valve (2CV-4652)** **c) Close SG Blowdown Isolation valves** **• 2CV-1016-1** **• 2CV-1066-1** **d) GO TO Step 8.C** **Examiner Note: 2K12-H9 "EFWP ROOM(S) LEVEL HI alarms due to the flange leak on 2P-7B EFW pump resulting in the motor fault.**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	ANY	C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check RCS TC 540°F to 555°F E. Check SG pressure 950 psia to 1050 psia. F. IF MSIVs open, AND desired, THEN place SDBCS Master Controller in Auto/Local with setpoint of 960 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation. **Examiner Note: EFAS is actuated but NO EFW pumps are available. SRO may discuss TS 3.0.3 for no EFW trains.**

Cue: If contacted as the WCO to investigate 2P-7B, report that 2P-7B discharge flange has a small leak that appears to have sprayed on the motor and the motor has black flash mark near the motor vents. If requested, to quantify the leak report that it is a small trickle.

Cue: If requested to isolate the leak after 5 min report the leak was isolated by closing. 2EFW-4B and 2EFW-3B, after an additional five min remove the malfunction EFWROOMB for 2P-7B room level alarm.

Cue: If contacted as AO and sent to investigate EFW pump, 2P-7A, report that the overspeed linage is damaged and it cannot be reset.

Cue: If contacted as a NLO to investigate 2P-1B, report that the thrust bearing is extremely hot to the touch.

Cue: If contacted as a NLO to investigate 2P-1A, report that 'A' Main Feedwater pump has no abnormal indications.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
Cntmt Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity. 1) CAMS alarms • “CNTMT PART/GAS RAD HI/LO annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTNT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room.
	SRO	11. Direct NLOs to perform Attachment 47, Field Operator Post Trip Actions.
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.**		
	SRO	12. Verify Reactor trip announced on Plant page.
	SRO	13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL critical alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **15 Contingency actions** IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following: A. Notify control room staff of safety functions NOT satisfied. B. **GO TO** Exhibit 8, Diagnostic Actions.
	SRO	**Diagnose Loss of Feedwater EOP 2202.006.**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
		Enter and implement Loss of Feedwater EOP 2202.006.
		CAUTION Failure to use average CETs to monitor MTS with ALL RCPs stopped may result in misleading evaluation of core conditions
	SRO	Direct STA to perform the following: *1. Confirm diagnosis of Loss Of Feedwater by checking SFSC acceptance criteria satisfied every 15 minutes.
	SRO	*2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	3. Open Placekeeping page.
	SRO	4. Notify Control Board Operators to monitor floating steps.
	ATC	5. Reduce RCS heat input as follows: A. Stop ALL RCPs. B. Verify BOTH PZR Spray valves in MANUAL and closed. **Examiner note: These actions may have been completed in SPTAs.**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
	BOP	6. Conserve SG inventory as follows: A. Verify SG Blowdown Isolation valves closed: • 2CV-1016-1 • 2CV-1066-1 B. Verify SG Sample valves closed. • 2CV-5850 • 2CV-5858 • 2CV-5852-2 • 2CV-5859-2 **Examiner Note: SRO may bring forward step 12 to establish a feed source. Step 12 is on page 48.**
	BOP	■ 7. Check ALL AC and Vital DC buses energized.
	ATC	*8. Maintain RCS pressure 1800 psia to 2250 psia using 2202.010 Attachment 48, RCS Pressure Control.

Crew performs Attachment 48, RCS Pressure Control

NOTE

Once method of pressure control is established, this attachment is not required in hand or continuous use.

A change to the method of pressure control will require in hand or continuous use until the new pressure control method is established.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
Attach 48	ATC	*1. Maintain RCS pressure with heaters and spray using one or more of the following: A. IF desired to use PZR Pressure controller (2PIC-4626A/B), THEN perform the following: * 1) Verify RCS MTS greater than 30 degrees. 2) Adjust PZR Pressure controller (2PIC-4626A/B) setpoint to desired pressure. B. IF desired to use PZR Heaters, THEN perform the following: 1) Cycle available PZR Backup heaters as necessary. 2) Cycle available PZR Proportional heaters as necessary. D. IF desired to use AUXILIARY Spray, THEN perform the following: * 1) Verify RCS MTS greater than 30 degrees. 2) Verify at least ONE Charging pump running. 3) Close Regen HX to RCP B/C valves: • 2CV-4827-2 • 2CV-4831-2

NOTE

PZR Spray Block valves 2CV-4653 and 2CV-4655 are de-energized due to degraded power supply cables.

Time	Position	Applicant's Actions or Behavior
Attach 48	ATC	4) Verify PZR Spray (2CV-4651/2CV-4652) or PZR Spray Isolation valves (2HS-4655/2HS-4653) closed.

NOTE

- Securing Charging pumps will secure/change Aux Spray flow.
- Securing all Charging pumps will terminate emergency Boration, if in progress.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
Attach 48	ATC	5) Perform EITHER of the following to control RCS pressure: • Throttle Aux Spray valve (2CV-4824-2) as necessary. • Start and stop Charging pump(s) as necessary.
		6) IF Regen HX to RCS temperature (2TI-4825) can NOT be reduced to less than 275°F, THEN perform ONE of the following: a) Isolate Letdown to reduce temperature. b) Complete Table 1 of this attachment.
		7) IF Regen HX to RCS (2TI-4825) AND PZR water phase (2TI-4627) differential temperature greater than 200°F AND PMS is unavailable, THEN complete Table 1 of this attachment.
Return to LOAF	SRO	The SRO should direct the following action to be completed. 9. Locally remove danger tags and close the following breakers: • 2B51-E4 "LTOP RELIEF ISOL 2CV-4730-1" • 2B51-K2 "LTOP RELIEF ISOL 2CV-4741-1"
Cue: When contacted as a NLO to close the LTOP relief isolation valves, after 2 min have the booth operator close the LTOP breakers, then report the 2B51-E4, and 2B51-K2 are closed.		
LOAF	ANY	■10. Check IA pressure greater than 65 psig.
LOAF	SRO	11. IF FW established to at least ONE SG, THEN GO TO Step 15. **Examiner note: FW will not be established.**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
LOAF	SRO	■12. Establish a SG feed source from at least one of the following (listed in preferred order): A. EFW Pump 2P7B using 2202.010 Attachment 53, Recovery From Loss of Feed With 2P7B. B. EFW Pump 2P7A using 2202.010 Attachment 54, Recovery From Loss of Feed With 2P7A. C. AFW Pump 2P75 using 2202.010 Attachment 55, Recovery From Loss of Feed With 2P75. D. MFW Pumps using 2202.010 Attachment 56, Recovery From Loss of Feed With Main Feed Pumps. E. Condensate Pumps using 2202.010 Attachment 57, Recovery From Loss of Feed With Condensate Pumps. **Examiner note: AFW pump 2P75 is the first option available.**
Transition to Attachment 55, Recovery From Loss of Feed With 2P75.		
	SRO	1. IF 2P7A or 2P7B EFW pumps running, THEN verify 2P75 suction aligned to an alternate source using 2106.006, Emergency Feedwater System Operations. **Examiner Note: This step is NA, no EFW pumps are running.**
Attach 55	ANY	2. IF 4160VAC Bus 2A1 is energized from SU XFMR #2, THEN perform the following: **Examiner Note: This step is NA.**
		4. IF MSIS or CSAS actuated, THEN locally open “DC CONTROL POWER” breaker in the following breaker cubicles: **Examiner Note: This step is NA.**

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9
Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.		

Time	Position	Applicant's Actions or Behavior
Attach 55	ANY	5. Perform the following to start AFW Lube Oil pump (2P225): A. Place 2HS-0766 in ON. B. Check 2P225 amber light OFF. C. IF 2P225 NOT available, THEN RETURN TO procedure in effect.
		6. Verify following valves closed: • AFW to 2P7A DISCH (2CV-0761) • AFW to 2P7B DISCH (2CV-0760)
		7. Start 2P75. **Examiner Note: AFW pump 2P75 will trip on low Lube Oil pressure, SRO will return to step 12 and choose Attachment 56, Recovery From Loss of Feed With Main Feed Pumps.**
		8. Perform the following to secure 2P225: A. Place 2HS-0766 in OFF. B. Place 2HS-0766 in AUTO.

Cue: If contacted as a NLO to investigate 2P-75, report that there is a large lube oil leak and 2P-75 is no longer running.

Transition to Attachment 56, Recovery From Loss of Feed With Main Feed Pumps.

NOTE

The Main Feedwater pumps can be reset and started even if condenser vacuum is not present, However, running a Main Feedwater pump without condenser vacuum may cause the LP turbine rupture discs to fail.

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Attach 56	ANY	1. Perform the following as necessary: A. IF MSIVs are open, THEN GO TO step 2. B. IF MSIVs are closed, THEN perform the following: **Examiner Note: MSIV's should be OPEN.** 2. IF NO Condensate pump running, THEN start a Condensate Pump using 2202.010 Attachment 50, Condensate Pump Start. **Examiner Note: Condensate pumps are running.** 3. Establish MFW flow to SGs as follows:
NOTE Both Instrument AC panels 2Y1 AND 2Y2 must be energized to reset EITHER MFW pump.		
Attach 56	ANY	A. IF 2Y1 or 2Y2 busses de-energized, THEN commence power restoration using 2202.010 Attachment 11, Degraded Power. **Examiner note: 2Y1 and 2Y2 should be energized.**
Attach 56	ANY	B. IF Instrument Air pressure less than or equal to 65 psig, THEN perform the following: **Examiner note: IA pressure will be greater than 65 psig.**
	BOP	*C. Throttle BOTH Condensate Pump Recirc valves to maintain Discharge pressure less than 700 psig: • Condensate Loop A Recirc valve (2CV-0663) • Condensate Loop B Recirc valve (2CV-0662)

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Attach 56	BOP	D. IF SG A NOT isolated AND desired to feed SG A, THEN verify the following valves open: • Feedwater Block Valve to SG A (2CV-1024-1) • Feedwater Block Valve to SG A (2CV-1023-2) E. IF SG B NOT isolated AND desired to feed SG B, THEN verify the following valves open: • Feedwater Block Valve to SG B (2CV-1074-1) • Feedwater Block Valve to SG B (2CV-1073-2)
	BOP	F. Verify MFW pump Low Flow Bypass switches in BYPASS: • 2HS-0736 • 2HS-0743
	BOP	G. Verify at least ONE MFW Lube Oil pump running
Attach 56	BOP	H. Reset and start ONE MFW pump as follows: 1) Place selected MFW pump Turbine Speed controller in MANUAL at 0%: • A MFP SPEED (2HIC-0321) • B MFP SPEED (2HIC-0310) 2) Depress selected reset pushbutton. 3) Raise selected MFW pump Turbine Speed controller to High Speed Stop: • A MFP SPEED (2SC-0321) • B MFP SPEED (2SC-0310) 4) Raise selected MFW pump turbine speed to obtain desired feedwater flow: • A MFP SPEED (2HIC-0321) • B MFP SPEED (2HIC-0310)

Op-Test No.: 2017-1	Scenario #1	Event No: 6, 7, 8 & 9

Event Description: (6) Main Turbine trip causing a Reactor trip (7) Main Feedwater pump trip / 2P-7B Emergency Feedwater (EFW) motor fault. (8) 2 CEAs remain withdrawn (9) AFW pump 2P-75 trips on loss of lube oil.

Time	Position	Applicant's Actions or Behavior
Attach 56	BOP	I. Continue efforts to establish operating EFW pump or AFW pump. J. Control the following as desired or required to restore SG level(s) to 60%: • A MFP SPEED (2HIC-0321) • A MFW Reg Valve (2HIC-0748) • A MFW Reg Valve Bypass (2HIC-0753) • A MFWP Recirc (2FIC-0735, 2CV-0741) • B MFP SPEED (2HIC-0310) • B MFW Reg Valve (2HIC-0740) • B MFW Reg Valve Bypass (2HIC-0744) • B MFWP Recirc (2FIC-0742, 2CV-0749)
	BOP	*4. Maintain Hotwell level greater than 38%. 5. Return to procedure in effect.

Critical Task: Restore Feedwater prior to both SG levels reaching 70” wide range.

Termination criteria: When feedwater restored or at Lead Examiner’s discretion.

NOTE

- Low CCW flow and pressure alarms can momentarily occur during pump swaps due to check valve and/or pressure control valve repositioning. (Per System Engineer) (CR-ANO-2-2007-0603)
- Swapping CCW pumps with loops cross tied changes Surge Tank levels.

18.2 CCW PUMP SWAP

18.2.1 Perform the following to START (2P-33B) and STOP (2P-33C):

A. Throttle open 2P-33B Casing Vent (2CCW-1029).

B. WHEN solid stream of water appears,
THEN close 2P-33B Casing Vent (2CCW-1029).

C. Place 2P-33B handswitch (2HS-5228) to START.

D. Place 2P-33C handswitch (2HS-5234) to STOP.

E. Observe the following:

- Normal flow 1000 to 3000 gpm (2FIS-5202)
- 2P-33B discharge pressure 100 to 120 psig (2PI-5228)

F. IF 2P-33C removed from service for maintenance,
THEN place 2P-33C handswitch (2HS-5234) in PTL.

18.2.2 Perform the following to START (2P-33C) and STOP (2P-33B):

A. Throttle open 2P-33C Casing Vent (2CCW-1031).

B. WHEN solid stream of water appears,
THEN close 2P-33C Casing Vent (2CCW-1031).

C. Place 2P-33C handswitch (2HS-5234) to START.

D. Place 2P-33B handswitch (2HS-5228) to STOP.

E. Observe the following:

- Normal flow 1000 to 3000 gpm (2FIS-5202)
- 2P-33C discharge pressure 100 to 120 psig (2PI-5234)

F. IF 2P-33B removed from service for maintenance,
THEN place 2P-33B handswitch (2HS-5228) in PTL.

Facility: ANO-2	Scenario #2 (New)	Op-Test No.: 2017-1
Examiners:		Operators:

Initial Conditions:
100% MOL, RED Train Maintenance Week.

Turnover:
100%. 260 EFPD. EOOS indicates 'Minimal Risk'. RED Train Maintenance Week.

Evolution scheduled: Drain Containment Sump to 50% level. Steps 20.1.1 and 20.1.2 of OP-2104.014 have been completed.

Event No.	Malf. No.	Event Type*	Event Description
1	XSI2LT56412	I (BOP) I (SRO) TS (SRO)	Containment sump level indicator fails during normal drain evolution. **OP-2104.014, LRW and BMS Operations**
2	XCV2LT4861	I (ATC) I (SRO)	Volume Control Tank level instrument fails low resulting in Refueling Water Tank being aligned to Coolant Charging Pump suction. **OP-2203.012L Annunciator 2K12 Corrective Action.**
3	XRC2PT46012	I (BOP) I (SRO) TS (SRO)	RCS narrow range pressure transmitter fails high. **OP-2203.012D Annunciator 2K04 Corrective Action.**
4		R (ATC) N (BOP) N (SRO)	System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min. **OP-2203.054 Abnormal Grid.** **OP-2203.053 Rapid Power Reduction.**
5	CVCPRESS	C (ATC) C (SRO)	Letdown flow and pressure oscillations. **OP-2203.012L Annunciator 2K12 Corrective Action.**
6	CV10101 MS1002	M (ALL)	'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP** **OP-2202.005, Excess Steam Demand.**
7	CV1051	C (BOP) C (SRO)	Upstream ADV 2CV-1051 fails open. **OP-2105.008, Steam Dump and Bypass Control System operations.**

End Point	Post ESD Blowdown RCS temperature and RCS pressure have been stabilized within the PT limits

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	1
Abnormal Events (2-4)	4
Major Transients (1-2)	1
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	0
Critical Tasks (2-3)	2

Critical Task	Justification	
Stabilize and control RCS temperature after the ESD blowdown terminates. RCS Tc must be limited to less than 80 degree F heatup.	Rates of temperature and pressure changes are limited so that the maximum specified heatup and cooldown rates do not exceed the design assumptions and satisfy the stress limits for cyclic operation. Also, If RCS heatup is allowed after SG blowdown, the RCS could over pressurize and result in lifting PZR and SG safeties. These pressure stresses added to thermal stresses of rapid cooldown could present PTS concerns.	• CE EPGB Simulator CTs: CT-07, Establish RCS temperature Control (SPTA-07, ESDE-05) • TS 3.4.9.1 RCS Pressure/Temperature Limits
Maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation throughout implementation of SPTAs and Excess Steam Demand EOP.	RCS pressure must be maintained in these limits to allow natural circulation of the RCS and prevent over pressurizing the RCS boundary. If the failure of 2CV-1051 goes undetected 200°F will be exceeded.	• CE EPGB Simulator CTs: CT-06, Establish RCS Pressure Control (SPTA-05, ESDE-07) • EOP 2202.005 Excess Steam Demand EOP.

Scenario #2 Objectives

1) Evaluate individual response to a failure of a Containment sump level transmitter.
2) Evaluate individual response to the VCT level transmitter failure.
3) Evaluate individual response to a failure of a RCS narrow range pressure transmitter.
4) Evaluate individual ability to perform a rapid power reduction in plant power.
5) Evaluate individual response to a failure of Letdown pressure controller.
6) Evaluate individual response to a failed closed Main Steam Isolation Valve.
7) Evaluate crew's ability to mitigate an Excess Steam Demand Outside containment.
8) Evaluate individual response to and Atmosphere Dump valve failure.

SCENARIO #2 NARRATIVE

When the crew has completed their control room walk down and brief, The BOP will drain the Containment sump to the Auxiliary building sump using the normal drain method. When level lowers below ~60% the containment sump level indicator will fail high. The BOP should secure the containment sump drain. The SRO will determine that Tech Spec 3.4.6.1 is applicable and will enter Tech Spec 3.4.6.1 action b. [Site OE: CR-ANO-2-1993-1669, CR-ANO-2-2003-071, Failed Containment sump level indicator.]

After the SRO has entered the appropriate Tech Spec, secured containment sump drain or cued by lead examiner, one of the Volume Control Tank level transmitters, 2LT-4861, will fail low. The crew will respond to VCT low low level alarm, 2K12 G5. This will result in the VCT outlet valve to the charging pump suction closing and the Refueling Water tank (RWT) suction to the charging pumps opening. RCS temperature and pressure will lower due to boration until the ATC opens VCT outlet valve manually and closes the RWT valve manually.

After the Crew has realigned Charging pump suction to the VCT or at the lead examiner's cue, the 'B' narrow range Pressurizer pressure safety channel pressure instrument, 2PT-4601-2, will fail high. This will trip one of the four PPS trip channels for High Pressurizer pressure, Linear Power Density (LPD), and Departure from Nucleate Boiling (DNBR). RPS channel trip/pre-trip, and channel 'B' operator insert (2C03) trip and pre-trip lights will be lit for High Pressurizer pressure, and trip lights without pre-trip lights for LPD and DNBR. The SRO will refer to the ACA 2203.012D and tech specs 3.3.1.1 for guidance. The BOP will place Channel 'B' PPS in bypass for point 3, 4, & 5, for maintenance and trouble shooting. The crew will have one hour to place these points in bypass before exceeding the tech spec LCO. [Site OE: CR-ANO-2-2013-1721, Pressurizer pressure narrow range failed low.]

After the 'B' channel PPS points have been bypassed or at the lead examiner's cue, The Dispatcher will call the Control Room with a Transmission Loading Relief (TLR) to reduce plant output by ~150 MWe. The SOC will also report that all limits of EN-DC-199 are still met. If Contacted, Unit 1 will be unable to maneuver due to a planned refueling outage. The SRO will enter Abnormal Grid and Rapid Power Reduction and commence a power reduction to comply with the dispatcher's request. [Site OE: CR-ANO-C-2014-1142, CR-ANO-C-2014-03353, Dispatcher required power reductions]

After the ATC has completed the required reactivity manipulation and cued by lead the examiner, letdown pressure and flow will commence oscillating. The ATC should recognize this oscillation. The ATC will place letdown back pressure and letdown flow controllers in manual and stabilize flow and pressure. [Site OE: CR-ANO-2-2016-1648, Letdown oscillations.]

Once letdown flow/back pressure is being controlled manually and cued by the lead examiner, 2CV-1010-1 'A' Steam Generator Main Steam Isolation Valve will fail closed. The crew will verify the reactor is tripped. [Industry OE: SER 8-82, Inadvertent MSIV closure.]

The Crew will implement Standard Post Trip Actions (SPTA), OP 2202.001. Main Steam Safety Valve (MSSV) will lift and then the setpoint will drift due to the castle nut backing off. The Crew will manually actuate Main Steam Isolation Signal (MSIS) or verify that a Main Steam Isolation signal automatically actuates. The Crew will secure and/or verify that Emergency Feedwater (EFW) is not feeding 'A' Steam generator. The ATC will secure two Reactor coolant Pumps when RCS pressure goes below 1400 psia. The SRO will diagnose Excess Steam Demand (ESD) EOP 2202.005. The SRO will direct the BOP to maintain post blowdown temperature and the ATC to maintain post blowdown RCS pressure. The crew will restore Service Water to Component Cooling Water. [PRA item # 9 restore service water to CCW] [Industry OE for Excess Steam Demand, SOER 82-7, Reactor Vessel Pressurized Thermal Shock.]

When the BOP aligns for 'B' Steam Generator pressure control, 2CV-1051 Atmospheric Dump Valve (ADV) will fail open. The BOP should recognize it and use the ADV MOV isolation valve 2CV-1052 to control 'B' Steam Generator pressure. [Site OE: CR-ANO-2-1988-0215, CR-ANO-2-1989-157, ADV failure.]

Simulator Instructions for Scenario 2

Reset simulator to MOL 100% power IC stead state.
Place MINIMAL RISK and RED Train Maintenance Week signs on 2C11.
Containment Sump level ~ 74%
T1 set to CTL100 < 3
T6 set to E13M1051

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1	XSI2LT56412 Trigger = T1	100	Containment sump level indicator fails during normal drain evolution. **OP-2104.014, LRW and BMS Operations**
2	XCV2LT4861 Trigger = T2	0	Volume Control Tank level instrument fails low resulting in Refueling Water Tank being aligned to Coolant Charging Pump suction. **OP-2203.012L Annunciator 2K12 Corrective Action**
3	XRC2PT46012 Trigger = T3	2500	RCS narrow range pressure transmitter fails. **OP-2203.012D Annunciator 2K04 Corrective Action.**
4			System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min. **OP-2203.054 Abnormal Grid.** **OP-2203.053 Rapid Power Reduction.**
5	CVCPRESS Trigger = T4	.5	Letdown flow and pressure oscillations. **OP-2203.012L Annunciator 2K12 Corrective Action.**
6	CV10101 Trigger = T5 MS1002 Trigger = T5	0 0 / 10 min.	‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G. **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	CV1051 Trigger = T6	1 / 10 Sec.	Upstream ADV 2CV-1051 fails open. **OP-2105.008, Steam Dump and Bypass Control System operations.**

<table>
<tr><th colspan="3">Simulator Operator CUEs</th></tr>
<tr><td>At T=0</td><td>Trigger T1</td><td>Containment sump level indicator fails high during normal drain evolution</td></tr>
<tr><td colspan="3">Cue: If contacted as a NLO to monitor Aux. building sump level or Waste Tank level, then respond as requested.
Cue: When contacted as the WWM, then report that I&C will troubleshoot Containment sump level indicator 2LI-5641-2.</td></tr>
<tr><td>Cued by lead examiner</td><td>Trigger T2</td><td>Volume Control Tank level instrument fails low resulting in Refueling Water Tank being aligned to Coolant Charging Pump suction.</td></tr>
<tr><td colspan="3">Cue: When contacted as the WWM, then report that I&C will troubleshoot the level transmitter.</td></tr>
<tr><td>Cued by lead examiner</td><td>Trigger T3</td><td>RCS narrow range pressure transmitter fails.</td></tr>
<tr><td colspan="3">Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed Pressurizer pressure instrument.</td></tr>
<tr><td>Cued by lead examiner</td><td></td><td>System Dispatcher call with a TLR to reduce power to ~ 850MWe within 30 min.</td></tr>
<tr><td colspan="3">Cue: Call as the Systems Operations Center (SOC) with a Transmission Loading Relief (TLR) to reduce plant output by 150 MWe within 30 min. The SOC will also report that all limits of EN-DC-199 are satisfied and the reliability of Offsite power is not impacted. Unit 2 is being directed to lower load because Unit 1 is within 2 weeks of a Refueling Outage.
Cue: If requested as the WWM or off shift SRO to initiate Attachment B Transmission Loading Relief (TLR) Request, then respond as requested.
Cue: If requested as WWM or Off shift operator, then perform Attachment B Notifications.</td></tr>
<tr><td>Cued by lead examiner</td><td>Trigger T4</td><td>Letdown flow and pressure oscillations.</td></tr>
<tr><td colspan="3">Cue: When contacted as a NLO to investigate the letdown flow control valve, then report 2CV-4816 is stable and not oscillating.
Cue: When contacted as the WWM, then report that I&C maintenance will investigate the failed controller.</td></tr>
</table>

Cued by lead examiner	Trigger T5	‘A’ Steam Generator MSIV 2CV-1010-1 fails closed.
Cued by lead examiner	Trigger T5	Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
2CV-1051 permissive.		Upstream ADV 2CV-1051 fails open.

Op-Test No.: 2017-1	Scenario #2	Event No.: 1

Event Description: Draining the Containment sump beginning with step 20.1.3 and Containment Sump level instrument fails high (Tech Spec for SRO)

Time	Position	Applicant's Actions or Behavior
		Examiner Note: Per turnover steps 20.1.1 and 20.1.2 of 2104.014, LRW and BMS Operations, were previously completed.
		<u>NOTE</u> Draining Containment Sump will cause rate of change hi alarm (2K01-H9).
	BOP	20.1.3 Open the following valves to drain CNTMT sump: • Containment Sump Isolation valve (2CV-2060-1) • Containment Sump Isolation valve (2CV-2061-2)
Cue: If contacted as a NLO to monitor Aux. building sump level or Waste Tank level, then respond as requested.		
	ANY	*20.1.4 Using level indication or corresponding computer points, monitor the following to prevent overflow: • Aux Building sump (2LIS-2000 or 2LIS-2000B) • In service Waste tank: - 2T-20A (2LIS-2010) - 2T-20B (2LIS-2012)
	BOP	*20.1.5 Cycle 2CV-2061-2 as necessary to prevent overflowing Aux Building sump.
		<u>NOTE</u> It is undesirable to drain Containment Sump below indication range.
	BOP	20.1.6 <u>WHEN</u> draining is complete, <u>THEN</u> close the following valves: • 2CV-2061-2 • 2CV-2060-1

Op-Test No.: 2017-1	Scenario #2	Event No.: 1
Event Description: Draining the Containment sump beginning with step 20.1.3 and Containment Sump level instrument fails high (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ANY	Announce alarm: • 2K10-B7, CNTMT SUMP LEVEL HI **Examiner Note: At ~ 60%, Containment Sump level, 2SI-LIS-5462-2 fails high.**
	BOP	Report to the SRO that Containment Sump level indicator 2SI-LIS-5641-2 has failed HIGH. **Examiner Note: Crew should secure Cntmt Sump draining.**
Enter 2203.012J, Annunciator 2K10 Corrective Action.		
<u>NOTE</u> CNTMT Sump level of 85% (2LIS-5641-2) is EL 335’ 11.25” and the containment floor is EL 336’ (M-2505 Sh 95)		
	BOP	1.0 CAUSES 1.1 CNTMT Sump level > 85% (2LIS-5641-2)
	BOP	2.0 ACTION REQUIRED 2.1 Check CNTMT Sump level (2LIS-5641-2) and PMS/PDS trends to validate alarm. • IF alarm invalid, THEN no further action required.
	BOP	2.2 IF LOCA NOT in progress, THEN drain CNTMT Sump using LRW and BMS Operations (2104.014).
	BOP	2.3 Perform RCS LKRT using Reactor Coolant System Leak Detection (2305.002).

Op-Test No.: 2017-1 Scenario #2 Event No.: 1

Event Description: Draining the Containment sump beginning with step 20.1.3 and Containment Sump level instrument fails high (Tech Spec for SRO)

Time	Position	Applicant's Actions or Behavior
	BOP	2.4 IF containment activity NOT rising on CAMS, THEN check the following: 2.4.1 CNTMT Sump valves closed: • Suction Isolation 2CV-5649-1 (2HS-5649-1) • Suction Isolation 2CV-5650-2 (2HS-5650-2) 2.4.2 CCW Expansion tank (2T-37B) level NOT lowering. 2.4.3 SW Header Pressure (2PIS-1417-1 and 2PIS-1423-2) normal (55 to 118 psig). 2.4.4 CNTMT BLDG CHILLED WATER PRESS LOW (2K13-A4) NOT in alarm. 2.4.5 FIRE WATER FLOW (2K11-B9) NOT in alarm. 2.4.6 No unexplained trends in Steam Flow, Feed Flow, or Steam Generator Levels.
	SRO	2.5 IF sump level greater than 100%, THEN refer to Tech Spec 3.4.6.1. **Examiner note: SRO must enter Tech Spec 3.4.6.1 action ‘b’ due to sump indication failure.**
	ANY	Contact work management.

Cue: When contacted as the WWM, then report that I&C will troubleshoot Containment sump level indicator 2LI-5641-2.

Termination criteria: When Tech Spec 3.4.6.1 action b. is entered and Cntmt sump draining secured or at lead examiner’s discretion.

Op-Test No.: 2017-1	Scenario #2	Event No.: 2
Event Description: Volume Control Tank level instrument fails low resulting in Refueling Water Tank being aligned to Coolant Charging Pump suction.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce alarm: • 2K12-G5, VCT 2T4 level LO LO
Enter 2203.012L, Annunciator 2K12 Corrective Actions.		
	ATC	1.0 CAUSES 1.1 VCT level (2LS-486lB) ≤ 9.6%
	ATC	2.1 Check the following indications: • VCT level (2LIS-4857) • Computer Point C&VCS VOLUME CONT TK2T4 LVL (L4857) **~ 72%** • Computer Point C&VCS VOLUME CONT TK2T4 LVL (L4861) **- 0%**
	ATC	2.2 IF VCT level lowers to 5%, THEN verify Charging Pump suction shifts to RWT: • CCPs Suction From RWT (2CV-4950-2) open • VCT Outlet (2CV-4873-1) closed **Examiner Note: This step is NA.**

	ATC	2.3 IF diverse indications reveal LO LO Level is false (e.g. instrument failure) AND Charging pump suction has shifted to RWT, THEN perform the following as necessary: 2.3.1 Open VCT Outlet (2CV-4873-1) (2HS-4873-1). 2.3.2 Close CCPs Suction From RWT (2CV-4950-2) (2HS-4950-2). 2.3.3 Match Tave within 2°F of Tref per Power Operation (2102.004). 2.3.4 Submit CR/WR as necessary. **Examiner Note: It will take approximately 4 minutes to see a change in RCS temperature. The BOP should lower main turbine load to maintain Tave constant.**
Cue: When contacted as the WWM, then report that I&C will troubleshoot the level transmitter.		
Termination criteria: When Charging pump suction has been aligned to the VCT or at lead examiner's discretion.		

Op-Test No.: 2017-1	Scenario #2	Event No.: 3
Event Description: RCS narrow range press. transmitter fails HI, (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce annunciators: • 2K04-A5 CH B RPS/ESF/PRETRIP/TRIP • 2K04-B3 PPS Channel TRIP
	ANY	Report Pressurizer pressure pretrip/trip on PPS insert.
Enter 2203.012D, Annunciator 2K04 Corrective Action.		
	ATC	Compare all four channels and report 2PT-4601-2N failed HI.
	SRO	**2K04-A5 CH B RPS/ESF/PRETRIP/TRIP applicable actions:** 2.1 Refer to PPS insert on 2C03 to determine cause. 2.2 Compare all Channels to validate alarm. 2.6 IF channel failed, THEN refer to Tech Specs 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6, and TRM 3.3.1.1. **2K04-B3 PPS Channel TRIP applicable actions:** 2.1 Determine which RPS or ESFAS trips have occurred on PPS inserts. 2.3 IF channel failed, THEN refer to Tech Specs 3.3.1.1 and 3.3.2.1 and TRM 3.3.1.1.
	SRO	Enter Tech Spec **3.3.1.1** Direct BOP to bypass the associated functional units: • Pressurizer Pressure - High • Local Power Density – High • DNBR – Low

Op-Test No.: 2017-1	Scenario #2	Event No.: 3
Event Description: RCS narrow range press. transmitter fails HI, (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	BOP	Bypass the points 3, 4 and 5 on Channel B: 11.1 Refer to Tech Spec 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6 and TRM 3.3.1.1. 11.2 Circle channel and functional units (points) to be bypassed below: Channel to be bypassed: A B C D Points to be bypassed: 1 2 3 4 5 6 7 8 9 10 11 12 13 16 17 18 19 20 11.3 Enter appropriate Tech Spec/TRM actions. 11.4 Verify points to be bypassed NOT bypassed in ANY other channel. 11.5 Place desired points in BYPASS for selected channel on 2C23. **Examiner Note: SRO must enter LCO 3.3.1.1 action 2.**
	ANY	Annunciator 2K04-F3 PPS TEST/SECURITY will alarm while opening PPS door Annunciator 2K04-C3 PPS CHANNEL BYPASSED remains in alarm Verify correct channels in bypass.
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed Pressurizer pressure instrument.		
Termination Criteria: Affected channel parameters placed in bypass or at lead examiner's discretion.		

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner: **Cue: Call as the Systems Operations Center (SOC) with a Transmission Loading Relief (TLR) to reduce plant output by 150 MWe within 30 min. The SOC will also report that all limits of EN-DC-199 are satisfied and the reliability of Offsite power is not impacted.** **Unit 2 is being directed to lower load because Unit 1 is within 2 weeks of a Refueling Outage.**		
Enter AOP 2203.054, Abnormal Grid		
	SRO	*1. **IF** unplanned loss of ANO transmission line has occurred, **OR** notified by dispatcher that a Transmission Loading Relief (TLR) has been issued for ANO, **THEN PERFORM** the following:
CAUTION When EITHER Mabelvale OR Pleasant Hill 500 KV transmission line out of service, a total net ANO generation limit is imposed to prevent overload of transmission equipment on Conway West to Morrilton line.		
NOTE • The requested power level should be achieved within 30 minutes, if possible. • Unit will generally take these requests unless Unit 1 is within 60 days of Refueling Outage • Total net ANO generation limit with an out of service 500 KV transmission line is a seasonal and expected to be between 100 and 1300 MW. • Combined Units in-house loads are ~ 80MW.		
	ALL	A. **IF** Unit 2 is selected to reduce power, **THEN COMMENCE** power reduction using EITHER of the following in conjunction with this procedure: • 2203.053, Rapid Power Reduction • 2102.004, Power Operations

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	SRO	B. **IF** TLR issued for ANO, **THEN INITATE** Attachment B, Transmission Loading Relief (TLR) Request. **Examiner Note: The SRO applicant may request someone else to initiate Attachment B.**
Cue: If requested as the WWM or off shift SRO to initiate Attachment B Transmission Loading Relief (TLR) Request, then respond as requested.		
	SRO	C. **PERFORM** Risk assessment using guidance in COPD 024, Risk Assessment Guidelines.
	SRO	D. **EVALUATE** offsite power operability using 2107.001 Supplement 4, Electrical System Alignment and Power Availability Check.
	SRO	E. **GO TO** Step 3.
• **If 2203.053, Rapid Power Reduction is entered continue below.** • **If 2102.004, Power Operation starts on page 23.**		
Enters 2203.053 Rapid Power Reduction.		
NOTE • This procedure was created in response to CR-ANO-C-2014-1142 CA 17 and designated as a CAPR by CR-ANO-C-2014-1142 CA 56. • Use of this procedure may be terminated at any point if a complete shutdown is not required. • Shutdown rate shall be based on plant conditions and safety considerations. Rate may be raised or lowered as plant conditions warrant.		
	SRO	*1. IF at any time, it is determined that significant manual actions are required to EITHER maintain the plant online, OR maintain the desired maneuvering rate, THEN perform the following: A. Trip the Reactor. B. GO TO 2202.001, Standard Post Trip Actions.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
		NOTE If Emergency Boration in progress, changing the number of running Charging pumps will change Boration rate.
	ALL	2. Commence Power reduction using appropriate reactivity plan. *A. Operate Charging and Letdown as necessary during power reduction. **Examiner Note:** • **Boration should be ~ 280 gallons at 13 gpm per the 2 hour Reactivity Plan** • **Boration steps (2104.003, Exhibit 3) are found on page 18** • **CEDMCS steps (2105.009, Exhibit 3) are found on page 21.**
		NOTE The CBOT is the preferred RO to lower turbine load so that the ATC can focus on primary plant control. However, either individual can operate the turbine as plant conditions dictate.
	BOP	* 3. Lower Turbine load as necessary to hold Tave within ± 3°F of program Tref.
		NOTE • CEAs should not be inserted below 80 inches withdrawn when the Reactor is at power and the CPC Aux trip is active. ASI would tend to shift back to the top of the core if CEAs are inserted more than halfway. • At higher power levels, larger (more aggressive) CEA insertions may be required (6 to 8 inches recommended initially). • ASI response to power changes at the end of core life is more severe, at times significantly so. The effects of ASI may not be seen until well into the power change. • Proactively driving ASI more positive than ESI (up to +0.05 deviation) will improve the ability to control ASI at lower power levels. • Exceeding COLR ASI limit will challenge CPC QASI Aux Trip setpoint and may result in automatic trip. CPC QASI Aux Trip occurs at ±0.45 (PID 187).

Op-Test No.: 2017-1	Scenario #2	Event No.: 4

Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.

Time	Position	Applicant's Actions or Behavior
	ATC	* 4. Perform the following for ASI: • Maintain ASI within Core Operating Limits Report (COLR) limits using CEA Group 6 or Group P. • Use ONE of the following to monitor ASI closely: - COLSS (CV9198) - IF COLSS inoperable, THEN use CPC channel ASI (PID 268) that most closely agreed with COLSS when it was operable. • Periodically monitor QASI (PID 187). • Insert Group 6 (preferred at higher power) OR Group P CEAS (preferred at lower power) using Exhibit 3 of 2105.009, CEDM Control System Operation, as necessary.
	BOP	* 5 IF desired to transfer unit auxiliaries from Unit Aux transformer to SU #3, THEN perform Attachment A, Transferring Loads to SU #3.
	BOP	*6 Throttle Condensate recircs as necessary to maintain 650-750 psig Condensate Pump Discharge pressure: • 2CV-0662 (2FIC-0662) • 2CV-0663 (2FIC-0663)
	ANY	7. Perform notifications of power reduction using Attachment B, Notifications.
Cue: If requested as WWM or Off shift operator, then perform Attachment B Notifications.		
	ANY	*8. Monitor Secondary chemistry and adjust chemical feed as needed using 2106.028, Secondary System Chemical Addition.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
OP-2104.003, Chemical Addition Exhibit 3 (Normal Boration).		
R A P		CAUTION The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R3.
	ATC	1.0 IF a Reactivity Management Brief has NOT been conducted, THEN perform a Reactivity Management Brief per COPD-030 with an SRO. 2.0 IF this is the first Boration of the shift, THEN verify BAM Flow totalizer (2FQI-4926) reset. 3.0 IF desired, THEN record initial controller data: 2FIC-4926 Setpoint: _______ Demand: _______

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	ATC	4.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) set as follows: • Setpoint set to desired flow rate. • IF in MANUAL, THEN demand set to desired value. 5.0 Verify desired BAM pump (2P-39A OR 2P-39B) selected for automatic operation using BAM pump Select switch (2HS-4911-2). 6.0 Place Mode Select switch (2HS-4928) to BORATE. 7.0 Verify Charging Pump Suction From Boric Acid (2CV-4930) opens (2HS-4930). 8.0 Verify selected BAM pump running: • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2)
	ATC	*9.0 Verify BAM Tank Recirc open for running pumps: • 2T-6A recirc (2HS-4903-2) • 2T-6B recirc (2HS-4915-2) *10.0 IF additional boric acid flow required, THEN manually start additional BAM pump: • 2P-39A (2HS-4919-2) • 2P-39B (2HS-4910-2)

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	ATC	**CRITICAL STEP** 11.0 Operate Boric Acid Makeup Flow Batch controller (2FQIS-4926) as follows: 11.1 Depress AND hold red pushbutton. 11.2 Verify Boric Acid Makeup Flow Batch controller (2FQIS-4926) set for desired quantity. 11.3 Release Red pushbutton. 12.0 Verify Boric Acid Makeup Flow controller (2FIC-4926) indicates desired flow rate.
	ATC	*13.0 Perform the following to Start/Stop additional Charging pumps: 13.1 <u>IF</u> desired to raise flow, <u>THEN</u> perform the following: A. Start additional charging pumps as necessary. B. Adjust Boric Acid Makeup Flow controller (2FIC-4926) to desired flow rate. 13.2 <u>IF</u> desired to lower flow, <u>THEN</u> perform the following: A. Adjust Boric Acid Makeup Flow controller (2FIC-4926) to desired flow rate. B. Secure additional Charging Pumps as necessary.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	ATC	*14.0 Monitor the following parameters: • RCS T_{AVE} • Axial Shape Index • Reactor power **CRITICAL STEP** 16.0 WHEN Boric Acid Makeup Flow Batch controller (2FQIS-4926) at zero, THEN verify the following: • Boric Acid Makeup Flow Control (2CV-4926) closes. • No flow indicated on Boric Acid Makeup Flow controller (2FIC-4926).

Enter 2105.009, CEDM Control System Operation (CEDMCs Operations, Exhibit 3)

NOTE

- "CEA SELECTED" indicates selected CEA position.
- "GROUP SELECTED" indicates average position of selected group.
- Rod motion is inhibited by PMS CEA sequencing program if a deviation of six inches occurs in any regulating group.
- CEAC CH1 and CH2 annunciators on 2K04 and CEDMCS annunciators on 2K10 should be checked for applicability prior to moving CEAs.

R
A
P

CAUTION

The following section has a Reactivity Addition Potential (RAP) and is classified as Risk Level R2.
For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030, Reactivity Management Program.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	SRO	1.0 **IF** time allows **AND** Reactivity Management Brief has **NOT** been conducted, **THEN PERFORM** a Reactivity Management Brief per COPD-030 with an SRO.
	ATC	2.0 **IF** moving CEAs in group, **THEN**: 2.1 **ENSURE** Group Select switch to desired group position. 2.2 **IF** moving Group P CEAs, **THEN PLACE** P Group Select switch to P. 2.3 **ENSURE** Individual CEA Selection switches aligned to CEA in group selected to move. 2.4 **PLACE** Mode Select switch to MANUAL GROUP (MG) or MANUAL SEQUENTIAL (MS). * 2.5 **OBSERVE** CEAC and Pulse Counter CEA position indications to ensure CEA motion and alignment as CEAs are moved.
	ATC	RAP 2.6 **POSITION** groups as desired using Manual Control lever. 2.7 **PLACE Mode** Select switch to OFF. 2.8 **ENSURE Pulse** Counter and CEAC indications match.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	ATC	3.0 **<u>IF</u>** moving CEA individually, **<u>THEN</u>**: 3.1 **ENSURE** Group Select switch selected to group containing individual CEA. 3.2 **PLACE** Individual CEA Selection switches to desired CEA. 3.3 **PLACE** Mode Select switch to MANUAL INDIVIDUAL (MI). * 3.4 **OBSERVE** CEAC and Pulse Counter CEA position indications to ensure CEA motion and alignment as CEAs are moved. RAP 3.5 **POSITION** CEA as desired using Manual Control lever. 3.6 **<u>WHEN</u>** individual CEA movement complete, **<u>THEN</u> PLACE** Mode Select switch to OFF. 3.7 **ENSURE** Pulse Counter and CEAC indications match.
Enter 2102.004, Section 12 (Emergent Power Reduction) of Power Operation.		
RAP		**<u>CAUTION</u>** The following section has been determined to have a Reactivity Addition Potential (RAP) and this activity is classified as a Risk Level R1. For an Unplanned Reactivity Manipulation, the required controls for planned reactivity evolutions are not applicable during AOP (including ACA response) or EOP conditions IAW COPD-030.
	SRO	12.1 <u>IF</u> time allows <u>AND</u> Reactivity Management Brief has <u>NOT</u> been conducted, <u>THEN</u> perform a Reactivity Management Brief per COPD-030 with an SRO.

Op-Test No.: 2017-1	Scenario #2	Event No.: 4

Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.

Time	Position	Applicant's Actions or Behavior
		NOTE • Plant parameters may be monitored using Exhibit 2, Various Parameters Vs Reactor Power. • Boron adjustment data for power change may be obtained from Reactivity curves located in Plant Data book.
	SRO	12.2 IF plant must be off-line within one hour, THEN refer to Attachment H, Rapid Power Reduction. **Examiner Note: This step should be NA.**
		NOTE • Initially, only enough boric acid should be added to reduce power by a few percent (less than 5%). As power lowers, Xenon will start to peak causing power to drop faster. Dilution may be required to slow power reduction rate. • If one BAM Tank is out of service for Acid Reducing Chemistry, depletion of on-line BAMT during power reduction may result in TRM 3.1.8 entry.
	ATC	**CRITICAL STEP** 12.3 Commence Power reduction by performing the following as necessary: • Boration using Normal Borate Mode to Charging pump suction (unless directed otherwise by Abnormal Operating Procedure). Refer to Chemical Addition (2104.003), Exhibit 3, Normal RCS Boration at Power. • Boration from RWT or BAMT using Chemical Addition (2104.003), Attachment R, RCS Boration From The RWT or BAMT. • CEA insertion using CEDMCS Control System Operation (2105.009), Exhibit 3 CEDMCS Operations (normally for ASI control). **Examiner Note:** • **Boration should be ~ 280 gallons at 13 gpm per the 2 hour Reactivity Plan** • **Boration steps (2104.003, Exhibit 3) are found on page 18** • **CEDMCS steps (2105.009, Exhibit 3) are found on page 21.**

Op-Test No.: 2017-1	Scenario #2	Event No.: 4
Event Description: System Dispatcher call with a request to reduce power ~ 150 MWe within 30 min.		

Time	Position	Applicant's Actions or Behavior
	BOP	*12.4 Lower Turbine load as necessary to hold Tave within ± 2°F of program Tref using Exhibit 1, T_{AVE} VS T_{REF}. *12.4.1 IF desired to stop Turbine load OR Power reduction, THEN perform the following as necessary: A. Secure RCS Boration using Chemical Addition (2104.003). B. Commence RCS dilution using Chemical Addition (2104.003).

Termination Criteria: When the required reactivity manipulations is complete or at Lead Examiner's discretion.

Op-Test No.: 2017-1	Scenario #2	Event No.: 5
Event Description: Letdown flow and pressure oscillations		

Time	Position	Applicant's Actions or Behaviors
Cued by Lead Examiner	ANY	Announce alarms: • 2K12-E1, LETDOWN DISCH PRESS HI/LO • 2K12-J1, RADMONITOR FLOW LO Examiner Note: May not receive alarms prior to noticing oscillations.
Enter 2203.012L, Annunciator 2K12 Corrective Action.		
	ATC	2.2 Check the following indications: • Letdown HX BackPress CNTRL (2PIC-4812) • Computer Point C&VCS INTERM LD PRESS CONT (P4812) **Reports flow and pressure oscillations**
	ATC	2.3 Verify all Letdown Isolation valves open: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2
	ATC	2.5 <u>IF</u> Letdown HX Outlet Valve controller (2PIC-48I2) NOT controlling in AUTOMATIC, <u>THEN</u> perform the following IAW Chemical and Volume Control (2104.002):
	ATC	2.5.1 Place the following in MANUAL: • Letdown HX Outlet Valve controller (2PIC-48I2) • Letdown Flow controller (2HIC-4817)
Cue: When contacted as a NLO to investigate the letdown flow control valve, then report 2CV-4816 is stable and not oscillating.		
	ATC	2.5.2 Stabilize pressure (P4812) at 350 psig.
Cue: When contacted as the WWM, then report that I&C maintenance will investigate the failed controller.		
Termination criteria: When the crew has taken manual control and stabilized Letdown pressure or at lead examiner's discretion.		

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Report Reactor Tripped
Enter EOP 2202.001, Standard Post Trip Actions.		
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required. 2. Open Safety Function Tracking page.
Examiner Note: Crew may actuate MSIS due to the MSSV failing open.		
Reactivity Control Safety Function	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. Check startup rate is negative. C. ALL CEAs fully inserted by observing ANY of the following: 1) CEA Rod bottom lights illuminated. 2) CEAC 1 indicates ALL CEAs fully inserted. 3) CEAC 2 indicates ALL CEAs fully inserted.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries Safety Function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Check Main Turbine tripped by BOTH of the following: • ALL Main Stop Valves closed. • Generator megawatts indicate zero. B. Generator Output breakers open. C. Perform EITHER of the following as required: 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462 D. At least ONE 6900v AC bus energized. E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized G. BOTH DGs secured. **(DGs running unloaded, contingency satisfied)** H. At least ONE 125v Vital DC bus energized: • 2D01 - SPDS point E2D01 • 2D02 - SPDS point E2D02

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
RCS Inventory Control Safety Function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. **(Not Met due to the ESD, contingency actions may have to be performed.)** B. RCS MTS 30°F or greater. **A. Perform as necessary:** **1) <u>IF</u> SIAS actuated on PPS inserts, <u>THEN</u> GO TO Step 6.** **2) Verify PZR Level Control system restoring level to setpoint.**
RCS Pressure Control Safety Function	ATC	6. Check RCS Pressure Control: • 1800 to 2250 psia. **(Not Met due to the ESD, contingency actions may have to be performed.)** • Trending to setpoint. **(Not Met due to the ESD, contingency actions may have to be performed.)** • Normal PZR Spray and heaters controlling pressure. • Valid CNTMT Spray NOT in progress.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
RCS Pressure Control Safety Function	ATC	**Examiners Note: Contingency actions may have to be performed depending on the PZR level trend at the time this safety function is assessed.** **6. Perform as necessary:** **A. IF RCS pressure lowers to less than 1400 psia, THEN trip ONE RCP in EACH loop.** **B. IF NPSH requirements violated OR RCS MTS less than 30°F, THEN verify ALL RCPs tripped.** **D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed.** • **RCP A Spray Valve (2CV-4651)** • **RCP B Spray Valve (2CV-4652)** **F. IF RCS pressure lowers to 1650 psia or less, THEN perform the following:** **1) Verify SIAS actuated on PPS inserts.** **2) GO TO Step 7.**

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Core Heat Removal Safety Function.	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. B. CCW flow aligned to RCPs. C. Loop delta T less than 10°F. D. RCS MTS 30°F or greater. E. Check SW aligned to CCW. F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig. **Direct the contingency for step 7. E** **E. IF CCW available, THEN restore SW to CCW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment.**
Perform 2202.010, Exhibit 5 (CCW/ACW/SW Alignment)		
	BOP	1. IF SW suction NOT aligned to lake, THEN **RETURN TO** procedure in effect.
	BOP	2. IF SW NOT aligned to CCW AND CCW available, THEN perform the following: A. IF RCP seal temperatures less than 180°F, THEN restore SW to CCW by performing the following: 1). Override and open at least ONE SW to CCW/ACW Return valve: • 2CV-1543-1 • 2CV-1542-2

CAUTION

Supplying ACW flow and CCW cooling from a single pump may result in a low SW header pressure

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	BOP	2). Override and throttle open at least ONE SW to CCW /Main Chillers Supply valve: • 2CV-1530-1 • 2CV-1531-2 3). Maintain SW header pressure greater than 85 psig.
Continue EOP 2202.001, Standard Post Trip Actions.		

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	BOP	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level. **(Not met due to MSIS, perform contingency as necessary)** B. Check MFW in RTO. **(Not met due to MSIS, perform contingency as necessary)** C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check RCS T_C 540°F to 555°F **(NOT met)** E. Check SG pressure 950 to 1050 psia. **(NOT met)** F. <u>IF</u> MSIVs open, <u>AND</u> desired, <u>THEN</u> place SDBCS Master Controller in Auto/Local with setpoint of 960 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation. **Examiner Note: BOP may isolate EFW to ‘A’ SG or it will happen automatically depending on DP between the SGs.**
	BOP	**Perform step 8 contingency actions that are applicable:** **A. Perform the following:** **1) <u>IF</u> SG level lowering, <u>THEN</u> verify EFAS actuated. (To the ‘B’ S/G only)**

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	BOP	**B. Verify EITHER of the following:** • **BOTH MFW pumps tripped.** • **SG levels controlling at setpoint**
RCS Heat Removal Safety Function	BOP	**D. Perform as necessary:** **2) <u>IF</u> T_C less than 540°F, <u>THEN</u> perform the following:** **a) Verify Feedwater flow rate (MFW OR EFW) <u>NOT</u> causing T_C to lower.** **b) Verify SDBCS restoring T_C 540°F to 555°F using 2105.008 Exhibit 3, SDBCS Emergency Operation.**

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	BOP	E. Perform as necessary: 1) IF SG pressure 751 psia or less, THEN perform the following: a) Verify MSIS actuated on PPS inserts. b) Verify feed secured to the affected SG. NOTE If possible, maintain SG to RCS Δp less than 1600 psid. c) Maintain RCS post-cooldown conditions as follows: • Maintain RCS pressure within P-T limits with PZR heaters and spray using Attachment 48, RCS Pressure Control. • Maintain RCS temperature by steaming intact SG using Upstream ADV or Upstream ADV Isolation MOV using 2105.008 Exhibit 3, SDBCS Emergency Operation. d) **GO TO** Step 9.

Critical Task:

Stabilize and control RCS temperature after the ESD blowdown terminates. RCS Tc must be limited to less than 80 degree F heatup.

Critical Task:

Maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation throughout implementation of SPTAs and Excess Steam Demand EOP.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
		Perform Attachment 48, RCS Pressure Control
		NOTE Once method of pressure control is established, this attachment is not required in hand or continuous use. A change to the method of pressure control will require in hand or continuous use until the new pressure method is established.
	ATC	1. Maintain RCS pressure with heaters and spray using one or more of the following: A. IF desired to use PZR Pressure controller (2PIC-4626A/B), THEN perform the following: *1) Verify RCS MTS greater than 30 degrees. 2) Adjust PZR Pressure controller (2PIC-4626A/B) setpoint to desired pressure.
	ATC	B. IF desired to use PZR Heaters, THEN perform the following: 1) Cycle available PZR Backup heaters as necessary. 2) Cycle available PZR Proportional heaters as necessary.
		C. IF desired to use NORMAL Spray, THEN perform the following: *1) Verify RCS MTS greater than 30 degrees. 2) IF PZR Spray Valve (2CV-4651) to be used, THEN perform the following: a) Verify RCP 2P32A running. b) Place 2HS-4651B in MANUAL. c) Cycle PZR Spray Valve (2CV-4651) using 2HS-4651A.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Attach. 48	ATC	3) IF PZR Spray Valve (2CV-4652) to be used, THEN perform the following: a) Verify RCP 2P32B running. b) Place 2HS-4652B in MANUAL. c) Cycle PZR Spray Valve (2CV-4652) using 2HS-4652A. 4) IF RCS margin to saturation greater than 160°F, THEN complete Table 1 of this attachment.
Attach. 48	ATC	D. IF desired to use AUXILIARY Spray, THEN perform the following: *1) Verify RCS MTS greater than 30 degrees. 2) Verify at least ONE Charging pump running. 3) Close Regen HX to RCP B/C valves: • 2CV-4827-2 • 2CV-4831-2
NOTE PZR Spray Block valves 2CV-4653 and 2CV-4655 are de-energized due to degraded power supply cables.		
	ATC	4) Verify PZR Spray (2CV-4651/2CV-4652) or PZR Spray Isolation valves (2HS-4655/2HS-4653) closed.
NOTE • Securing Charging pumps will secure/change Aux Spray flow. • Securing all Charging pumps will terminate emergency boration if in progress.		
Attach. 48	ATC	5) Perform EITHER of the following to control RCS pressure: • Throttle Aux Spray valve (2CV-4824-2) as necessary. • Start and stop Charging pumps as necessary

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Perform 2105.008, Exhibit 3, SDBCS Emergency Operation		
Exhibit 3	BOP	1.0 IF BOTH MSIV's closed, THEN GO TO step 5.0.
	BOP	5.0 Perform the following to determine availability of UPSTREAM SDBCS valves: 5.1 IF the following conditions satisfied: • Instrument air available • EMERGENCY OFF (2K02-A14) annunciator clear • Power available to selected controllers/valves, THEN Upstream ADVs are available.
	BOP	5.2 IF the following conditions satisfied: • EMERGENCY OFF (2K02-A14) clear or Upstream ADV locally failed open • Power available, THEN ADV Upstream Isolation valve(s) are available.
	BOP	6.0 IF operation of Upstream Atmospheric Dump valve from the Control Room desired, THEN perform the following: 6.1 Verify selected HIC in MANUAL with ZERO output demand: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051)

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Exhibit 3	BOP	6.2 Place selected valve(s) permissive handswitch in MANUAL: • 2CV-1001 Permissive (2HS-1001) • 2CV-1051 Permissive (2HS-1051) **Examiner Note: When upstream ADV 2CV-1051 permissive is taken to manual the ADV will fail open.**
	BOP	6.3 <u>IF</u> MSIS actuated, <u>THEN</u> override "MSIS CLOSE" actuation for selected MOV isolation: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052)
Exhibit 3	BOP	*6.4 Throttle open selected MOV as desired: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052) **Examiner Note: Upstream AOV has failed; Examine should transition to section 7.**
	BOP	7.0 <u>IF</u> using ADV Upstream Isolation valve to control S/G pressure, <u>THEN</u> perform the following: 7.1 Verify selected HIC in MANUAL with output of 100%: • Hdr #1 UPSTM ADV 2CV-1001 (2HIC-1001) • Hdr #2 UPSTM ADV 2CV-1051 (2HIC-1051)
Exhibit 3	BOP	7.2 Place selected valve permissive handswitch in MANUAL: • 2CV-1001 Permissive (2HS-1001) • 2CV-1051 Permissive (2HS-1051)

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Exhibit 3	BOP	7.3 IF MSIS actuated, THEN override "MSIS CLOSE" actuation for selected MOV isolation: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052)
	BOP	*7.4 Throttle open selected MOV as desired: • ADV Upstream Isolation valve (2CV-1002) • ADV Upstream Isolation valve (2CV-1052)
Continue with SPTAs		

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Cntmt Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room. 11. Direct NLOs to perform Attachment 47, Field Operator Post Trip Actions 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL significant alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** **15. <u>IF</u> ANY safety function acceptance criteria <u>NOT</u> satisfied, <u>THEN</u> perform the following:** **A. Notify control room staff of safety functions <u>NOT</u> satisfied.** **B. GO TO Exhibit 8, Diagnostic Actions**.
	SRO	Diagnose Excess Steam Demand, EOP 2202.005.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
		Enter and implement Excess Steam Demand EOP 2202.005.
		CAUTION Failure to use average CETs to monitor MTS with ALL RCPs stopped may result in misleading evaluation of core conditions.
		NOTE Parameters in brackets [ ] reflect normal values corrected for harsh CNTMT environment with CNTMT temperature greater than 200°F or CNTMT radiation greater than 10^5 R/hr.
	SRO	*1. Confirm diagnosis of Excess Steam Demand as follows: A. Check SFSC acceptance criteria satisfied every 15 minutes. B. IF CCW in service to provide SG Sample Cooler cooling, THEN perform the following: 1) IF SG "A" has indicated water level, THEN verify the following SG 'A' Sample Valves open: • 2CV-5850 • 2CV-5852-2 2) IF SG "B" has indicated water level, THEN verify the following SG 'B' Sample Valves open: • 2CV-5858 • 2CV-5859-2 C. Notify Chemistry to sample available SGs for activity.
	SRO	2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	SRO	3. Open Placekeeping page.
	SRO	4. Notify Control Board Operators to monitor floating steps.
Examiner Note: The SRO may implement the floating step to Maintain RCS post-cooldown conditions if not direct from SPTAs.		
		■21. Maintain RCS post-cooldown conditions as follows: A. Maintain RCS temperature by steaming intact SG using EITHER of the following: • Upstream ADV • Upstream ADV Isolation MOV B. Control feedwater flow to intact SG using 2202.010 Attachment 46, Establishing EFW Flow. C. Maintain RCS pressure within P-T limits using 2202.010 Attachment 48, RCS Pressure Control.
	ANY	5. Verify the following: • MSIS actuated on PPS inserts • MSIVs closed
	ANY	*6. IF SIAS setpoints exceeded by EITHER of the following: • RCS pressure 1650 psia or less • CNTMT pressure 18.3 psia or greater THEN verify SIAS and CCAS actuated on PPS inserts.

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	ANY	*6. **<u>IF</u> SIAS setpoints <u>NOT</u> exceeded, <u>THEN</u> GO TO Step 7.**
	ANY	*7. Verify actuated ESFAS components using 2202.010, Exhibit 9, ESFAS Actuation. Evaluator Note: Exhibit 9 is a checklist of actuated components which will all be in the expected alignment.
	ANY	■ 8. Restore ESF/Non-ESF systems post-MSIS using 2202.010 Attachment 51, Post ESFAS Actuation System Restoration.
Attachment 51, Post ESFAS Actuation System Restoration		
	BOP	1. Verify at least ONE SW pump running on EACH loop. 2. IF ANY EDG in operation, THEN perform the following.
<u>CAUTION</u> Operation of loaded DG without Service Water for greater than three minutes may cause engine damage.		
Attach. 51	BOP	A. Check running EDG SW Outlet valve open: • 2DG-1 SW Outlet (2CV-1503-1) • 2DG-2 SW Outlet (2CV-1504-2)
	BOP	3. Verify SW pump suction aligned to Lake.
	ANY	4. <u>IF</u> SW pump suction can <u>NOT</u> be aligned to Lake, <u>THEN</u> perform the following: **Examiner Note: This step is NA**
	ANY	5. IF NEITHER 2A1 OR 2A2 energized from offsite power, SGTR STEP 10 THEN perform the following: **Examiner Note: This step is NA**

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Attach. 51	BOP	*6. IF BOTH 4160v Vital buses 2A3 AND 2A4 energized from offsite power, THEN start SW pumps as needed to maintain SW header pressure.
	BOP	7. IF NO 4160V busses energized, THEN return to procedure in effect. **Evaluator Note: Step is NA**
	ANY	*8. IF only ONE 4160v Vital bus energized from offsite power AND additional SW pump start desired to maintain SW header pressure, THEN perform the following: **Examiner Note: This step is NA**
Attach. 51	BOP	9. IF EITHER 4160v Vital Bus supplied by EDG, THEN verify only one SW pump running on train supplied by EDG. **Evaluator Note: Step is NA**
	BOP	*10. Maintain Service Water header pressure greater than 85 psig while performing the following using 2202.010 Exhibit 5, CCW/ACW/SW Alignment: A. IF Loop 2 CCW available, THEN restore Service Water to Component Cooling Water. B. Restore Service Water to Auxiliary Cooling Water.
Perform 2202.010, Exhibit 5 (CCW/ACW/SW Alignment)		
Exhibit 5	ANY	1. IF SW suction NOT aligned to lake, THEN RETURN TO procedure in effect. **Examiner Note: This step is NA**
	ANY	2. IF SW NOT aligned to CCW AND CCW available, THEN perform the following: **Examiner Note: This step is NA**

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Exhibit 5	ANY	3. IF CCW flow NOT aligned to RCPs AND offsite power available, THEN perform the following: **Examiner Note: This step is NA**
	ANY	4. IF SW NOT aligned to ACW, THEN perform the following: A. Verify at least ONE SW to CCW/ACW Return valve open: • 2CV-1543-1 • 2CV-1542-2 B. Override and throttle open ACW Supply valves: • 2CV-1425-1 • 2CV-1427-2 C. Maintain SW header pressure greater than 85 psig.
Return to Excess Steam Demand		
	ANY	*9. IF SIAS actuated, THEN verify Safety Injection flow to RCS as follows: A. Check total HPSI flow acceptable using Exhibit 2, HPSI Flow Curve. B. Check total LPSI flow acceptable using Exhibit 3, LPSI Flow Curve.
	ANY	*10. Verify the following for any operating RCP: A. CSAS NOT actuated. B. Proper seal staging.
	ANY	■11. Check CCW flow aligned to RCPs.
	ANY	■12. IF Circ Water flow lost to the Main condenser, THEN perform the following: **Examiner Note: This step should be NA**

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	ANY	■13. Check RCS pressure greater than 1400 psia.
	ANY	**■13. Perform the following: (Contingency Actions)** **A. <u>IF</u> RCS pressure less than 1400 psia, <u>THEN</u> perform the following:** **1) Verify maximum of ONE RCP running in EACH loop.** **2) <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.**
	ANY	■14. <u>WHEN</u> RCS T_C less than 510°F, <u>THEN</u> reduce number of running RCPs as follows: A. Verify maximum of ONE RCP running in EACH loop. B. <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.
	ANY	15. Determine most affected SG by comparing the following: • SG steam flows • SG pressures • SG levels • RCS T_C
	ANY	16. Check MSIS stopped Excess Steam Demand event.
	ANY	**16. Perform the following: (Contingency Actions)** **A. Commence MSIS verification using 2202.010 Attachment 4, MSIS Verification.** **B. GO TO Step 18.** **Examiner Note: Attachment 4, MSIS Verification, is a checklist of actuated components which will all be in the expected condition.**

Op-Test No.: 2017-1 Scenario #2 Event No.: 6 & 7

Event Description:

- 'A' Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on 'A' S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
	ANY	■18. IF BOTH SGs equally affected, THEN close Main Steam to EFW Pump Turbine valves: • 2CV-1000-1 • 2CV-1050-2 **Examiner Note: This step is NA.**
	ANY	■19. Isolate most affected SG using 2202.010 Attachment 10, SG Isolation. • IF affected SG still pressurized, THEN check MSSVs for affected SG closed by locally checking individual valve tail pipes for leakage.
2202.010 - Attachment 10, SG Isolation		
		STEAM GENERATOR A
NOTE Goal is to isolate the SG within 30 minutes of procedure entry to limit off-site release.		
	BOP	1. IF SG B to be isolated, THEN **GO TO** Step 4. **Examiner Note: This step is NA.**
NOTE • Steps two and three may be performed in any order. • Valves in Table 1 and Table 2 may be positioned in any order.		

Op-Test No.: 2017-1	Scenario #2	Event No.: 6 & 7

Event Description:

- ‘A’ Steam Generator MSIV 2CV-1010-1 fails closed and a Main Steam Safety fails open causing an Excess Steam Demand on ‘A’ S/G.
- Upstream ADV 2CV-1051 fails open

Time	Position	Applicant's Actions or Behavior
Attach. 10	BOP	2. Verify each component in the following table in the indicated position:

TABLE 1

COMPONENT DESCRIPTION	NUMBER	LOCATION	POSITION	√
ADV UPSTRM ISOL	2CV-1002*	2C02	CLOSED (1)	
2CV-1001 PERMISSIVE	2CV-1001	2C02	OFF (1)	
MSIV HEADER #1	2SV-1010-1A	2C17	CLOSED	
MSIV HEADER #1	2SV-1010-2A	2C16	CLOSED	
MSIV HEADER #1 BYP	2CV-1040-1	2C17	CLOSED (1)	
MAIN STEAM TO EFWP TURB 2K03	2CV-1000-1	2C17	CLOSED	
FEEDWATER BLOCK VALVE TO SG-A	2CV-1024-1	2C17	CLOSED	
FEEDWATER BLOCK VALVE TO SG-A	2CV-1023-2	2C16	CLOSED	
SG BLOWDOWN ISOLATION	2CV-1016-1	2C17	CLOSED (1)	
2P7B DISCHARGE TO SG-A	2CV-1038-2*	2C17	CLOSED (1)	
FLOW CONTROL VALVE TO SG-A	2CV-1025-1*	2C17	CLOSED (1)	
SAMPLE ISOLATION VALVE SG-A	2CV-5850	2C17	CLOSED (1)	
2P7A DISCHARGE TO SG-A	2CV-1026-2*	2C16	CLOSED (1)	
2P7A DISCHARGE TO SG-A	2CV-1037-1*	2C16	CLOSED (1)	
SAMPLE ISOLATION VALVE STEAM GEN A	2CV-5852-2*	2C16	CLOSED (1)	

* Denotes override capability.

NOTE #1: Valves may be open at SM/CRS discretion.

Termination criteria: When post-cooldown conditions have been stabilized or at examiner’s discretion.

NOTE

- IAW Plant Cooldown (2102.010), Containment sump level must be > 71% prior to closing Inside Sump Isolations during cooldown.
- If oil or foreign debris suspected to be in sump, sump level should be maintained > 71%. CR-ANO-1-2005-01994
- IAW Plant Heatup (2102.002) sump must be > 35% in sump prior to heatup from Mode 5.
- RADS can be used to monitor dose rate changes and formation of hot spots. (CR-ANO-2-2011-1976)

20.0 DRAINING CONTAINMENT SUMP

20.1 Normal CNTMT Sump Drain to Aux Building Sump

N/A 20.1.1 IF desired to sample Containment Sump, THEN **GO TO** "Sampling Containment Sump" section of this procedure.

CAUTION

Containment Sump drainage flow rate is greater than both Aux Building Sump pumps (2P-51A and 2P-51B) flow capacity.

20.1.2 Notify RP to monitor intended water transfer flow path for this evolution. (CR-ANO-2-2006-2706-CA-5)

NOTE

Draining Containment Sump will cause rate of change hi alarm (2K01-H9).

20.1.3 Open the following valves to drain CNTMT sump:

- Containment Sump Isolation 2CV-2060-1 (2HS-2060-1)
- Containment Sump Isolation 2CV-2061-2 (2HS-2061-2)

* 20.1.4 Using level indication or corresponding computer points, monitor the following to prevent overflow:

- Aux Building sump (2LIS-2000A or 2LIS-2000B)
- In service Waste tank:
  - 2T-20A (2LIS-2010)
  - 2T-20B (2LIS-2012)

* 20.1.5 Cycle Containment Sump Isolation 2CV-2061-2 (2HS-2061-2) as needed to prevent overflowing Aux Building sump.

NOTE

It is undesirable to drain Containment Sump below indication range.

20.1.6 WHEN draining complete,
THEN close the following valves:

- Containment Sump Isolation 2CV-2060-1 (2HS-2060-1)
- Containment Sump Isolation 2CV-2061-2 (2HS-2061-2)

20.1.7 Annotate sump drain in operator logs.

Facility: ANO-2	Scenario No.: 3 (New)	Op-Test No.: 2017-1

Examiners:	Operators:

Initial Conditions: ~100 % MOL, RED Train Maintenance Week. Alternate AAC diesel OOS for maintenance.

Turnover:

100%. 260 EFPD. EOOS indicates 'Minimal Risk'. RED Train Maintenance Week. Alternate AAC Diesel tagged for Maintenance.

Evolution scheduled: Pump the Reactor Drain Tank.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Pump the Reactor Drain Tank. **OP-2103.007, Quench Tank and RDT Operations**
2	XRCCHAPLVL	I (ATC) I (SRO) TS (SRO)	'A' Pressurizer Level channel fails low. **OP-2203.028, Pressurizer System Malfunction AOP**
3	CWS2P3BFLT	R (ATC) C (BOP) C (SRO)	'B' Circulating Water pump trip. **OP-2203.019, Loss of Condenser Vacuum AOP**
4	RCLOCATCA	C (ATC) C (SRO) TS (SRO)	A 7 gpm LOCA starts on the 'A' RCS cold leg. **OP-2203.016, Excess RCS leakage AOP**
5	XFW2TE0361	I (BOP) I (SRO)	Main Feedwater pump (MFWP) Lube oil controller temperature input fails. **OP-2203.012C, Annunciator 2K03 Corrective Action**
6	BUS2A1 FAILSU3	M (ALL)	2A-1 4160 Volt vital bus lockout, which will propagate to a Startup Transformer #3 (SU#3) lockout. (LOOP) **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	EDGDG1OIL EDG2OS	M (ALL)	#1 Emergency Diesel Generator (EDG) loss of lube oil, and #2 EDG will overspeed trip on start. (Station Blackout) **OP-2202.009, Functional Recovery EOP**
8	ESFEFAS12 ESFEFAS22	C (BOP) C (SRO)	2CV-1026-2 does not respond to (Emergency Feedwater Actuation Signal) EFAS. 2CV-1076-2 does not respond to EFAS.

End Point	Power is restored to a vital bus and feedwater aligned to at least on Steam Generator

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	1
Abnormal Events (2-4)	4
Major Transients (1-2)	2
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	1
Critical Tasks (2-3)	3

Critical Task	Justification	
Energize at least one vital AC bus prior to Margin to Saturation lowering below 30 degrees F.	Without any AC power available for ESF pumps, the ability to maintain the plant in a safe state is severely degraded since no makeup water can be added to the RCS for inventory control purposes.	• CE EPGB Simulator CTs: CT-03, Energize at least one vital AC bus. (MVA-03) • EOP 2202.009 Functional Recovery EOP. • ANO-2 SAR table 8.3.7, Reg Guide 1.155 and DCP 92-2011.
Maintain RCS pressure within the Pressure-Temperature limits of 200°F and 30°F Margin to Saturation and less than 2500 psia by performing any of the flowing : • Controlling PZR heaters, • Controlling charging and/or HPSI flow once power is restored.	Loss of RCS pressure control low will result in a loss of RCS subcooling. Once subcooling is lost, pressurizer level is no longer a valid indication of RCS mass inventory, and a reactor head void can form, both of which complicate the event recovery. Uncontrolled void growth could result in eventual core uncovery and fuel damage.	• CE EPGB Simulator CTs: CT-06, Establish RCS Pressure Control (PC-01) • EOP 2202.009 Functional Recovery EOP.
Restore Feedwater prior to both SG levels reaching 70" wide range.	Without feedwater, the SG being steamed will eventually boil dry, RCS heat removal will cease, and the reactor core will begin overheating (core melt potential). Thus, it is essential to steam and feed at least one SG to continue to remove RCS decay heat.	• CE EPGB Simulator CTs: CT-08, Establish RCS Heat Removal (HR-01) • EOP 2202.009 Functional Recover EOP • EOP 2202.006 Loss of Feedwater EOP Tech Guide

Scenario #3 Objectives

1) Evaluate individual ability to pump the Reactor Drain Tank.
2) Evaluate individual response to a failure of PZR level control channel failing low.
3) Evaluate individual response to a trip of the “B” Circ Water pump.
4) Evaluate individual response to an Excess RCS leakage event.
5) Evaluate individual response to Feedwater pump Lube oil controller temperature failure.
6) Evaluate individual response to a 2A-1 bus lockout and Startup Transformer #3 (SU#3) lockout.
7) Evaluate crew’s and individual ability to perform standard post trip actions.
8) Evaluate crew’s ability to respond to a Station Blackout out using Functional Recovery EOP.
9) Evaluate individual response to a failure of EFW MOV’s to respond to Emergency Feedwater Actuation Signal (EFAS).

SCENARIO #3 NARRATIVE

Simulator session begins with the plant at 100% power steady state.

When the crew has completed their control room walk down and brief, the BOP will pump the Reactor Drain Tank (RDT) to the online hold up tank. The BOP will pump the RDT from 50% level until the RDT pump cutout on low level at approximately 20.8%.

When the crew has pumped the Reactor Drain Tank or at the lead examiner’s cue, the ‘A’ Pressurizer level channel will fail low causing letdown to go to minimum, all pressurizer heaters to de-energize, all backup charging pumps to start and actual pressurizer level will rise. The SRO will enter Pressurizer Systems Malfunction AOP, OP 2203.028. The ATC will place letdown in manual to control flow and pressurizer level. The ATC will then select the unaffected pressurizer level channel for control of letdown, charging, and pressurizer heater control. After the unaffected pressurizer level channel is selected the ATC will restore letdown control to automatic. The SRO will enter Tech Spec 3.3.3.6 Post Accident Instrumentation. [Site OE: CR-ANO-2-2011-1575, Pressurizer level transmitter failed low due to a reference line failure.]

When the ATC has placed letdown in automatic or at the lead examiner’s cue, the ‘B’ Circulating Water pump will trip causing a reduction in Main Condenser vacuum. The SRO will enter Loss of Condenser Vacuum, 2203.019. The BOP will verify Condenser vacuum less than 7 inches HG Abs. The SRO will direct the ATC to commence emergency boration from a Boric Acid Makeup tank to lower reactor power. The SRO will direct the BOP to lower turbine load to maintain condenser vacuum within the acceptable region described in the AOP. When condenser vacuum has started to improve and is within the acceptable region of the AOP attachment, emergency boration and CEA insertion will be secured. The crew should then prepare to commence a controlled down power to restore condenser vacuum less than 5.15 inches HG Abs. [Site OE: CR-ANO-2-2003-1142, ‘A’ Circulating Water Pump Failure.]

SCENARIO #3 NARRATIVE (continued)

When condenser vacuum has been stabilized or at the lead examiner's cue, a 7 gpm RCS leak will start. The SRO will enter the excess RCS leakage AOP, OP 2203.016. ATC and BOP will perform RCS Leak rate determinations. The SRO will enter Tech Spec 3.4.6.2. The SRO will direct the ATC to maintain pressurizer level within 5% of set point by starting additional charging pumps as needed. The SRO will also direct the ATC to isolate letdown to determine the leak location. After the crew has determined the leak is not in letdown, they will restore letdown and the crew will commence a plant shutdown. [Industry OE: SEN-220, SEN-216, & SEN-182, RCS leakage events.]

The Main Feedwater pump (MFWP) Lube oil controller temperature input fails at the same time as the Circulating water pump trip. Temperatures will trend up and ~ 24 minutes of the input fails the rising temperature will cause 2K03 "TURB BRG OIL TEMP HI" to alarm. BOP refers to OP-2203.012C (D-8), Annunciator 2K03 Corrective Actions and will determine the input to the Lube oil temperature controller has failed. The BOP will to take manual control of the MFWP Lube Oil temperature 2TIC-5283 and restore Lube oil temperature to ~ 115 degrees F.

After control of the MFWP Lube Oil temperature has been established, or at the lead examiner's discretion 2A-1 Non-Vital 4160V bus will lockout and cause a Startup Transformer #3 (SU#3) lockout (this will de-energize non-vital busses but Offsite power will be available to be restored from Startup #2 Transformer) the crew will manually trip the reactor due the in-ability to maintain Steam Generator levels. The crew will then commence Standard Post Trip Actions. #1 EDG will fail shortly after it starts due to a loss of lube oil, and #2 EDG will overspeed trip on start and not be able to be reset. This will cause a station blackout. The SRO should diagnose Functional Recovery EOP due to the blackout and RCS leak. Also when EFAS actuates 2CV-1026-2 and 2CV-1076-2 EFW flow control valves will fail to automatically respond. The crew should manually open 2CV-1026-2 and 2CV-1076-2 and allow the series EFW valve to control SG level.[PRA item #6, Manually open EFW discharge valves to SG A or SG B] [Site OE: IER L2-14-46 Multiply Electrical Faults result in Explosion and transformer and Auto scram. Industry OE: SER 3-10 Electrical fault complicated by equipment failures, SOER 86-0: Reliability of PWR Auxiliary Feedwater Systems]

The SRO will enter Functional Recovery EOP, complete the entry section, and then direct actions using MVAC-1 to restore power from Startup Transformer #2 (SU#2).

Simulator Instructions for Scenario 3

Reset simulator to MOL 100% power IC steady state.

Ensure that AACG is out of service. AACEXPTANK = active, AACOVERSPD = active, AACLOPRESS = active, K12K03 = on

Place MINIMAL RISK and RED Train Maintenance Week signs on 2C11.

T5 = Reactor Trip

Event No.	Malf. No. / Trigger Number	Value/ Ramp/Time	Event Description
1			Pump the Reactor Drain Tank. **OP-2103.007, Quench Tank and RDT Operations**
2	XRCCHAPLVL Trigger = T1	0%	‘A’ Pressurizer Level channel fails low. **OP-2203.028, Pressurizer System Malfunction AOP**
3	CWS2P3BFLT Trigger = T2	active	‘B’ Circulating Water pump trips. **OP-2203.019, Loss of Condenser Vacuum AOP**
4	RCLOCATCA Trigger = T3	7 gpm	A 7 gpm LOCA starts on the ‘A’ RCS cold leg. **OP-2203.016, Excess RCS leakage AOP**
5	XFW2TE0361 Trigger = T2	0	Main Feedwater pump (MFWP) Lube oil controller temperature input fails. **OP-2203.012C, Annunciator 2K03 Corrective Action**
6	BUS2A1 Trigger = T4 FAILSU3 Trigger = T5	active active / delay = 10 sec.	2A-1 4160 Volt vital bus lockout, which will propagate to a Startup Transformer #3 (SU#3) lockout. (LOOP) **OP-2202.001, Standard Post Trip Actions (SPTAs) EOP**
7	EDGDG1OIL Trigger = T4 EDG2OS	Active Delay = 2 min. Active	#1 Emergency Diesel Generator (EDG) loss of lube oil, and #2 EDG will overspeed trip on start. (Station Blackout) **OP-2202.009, Functional Recovery EOP**
8	ESFEFAS12 ESFEFAS22	Active Active	2CV-1026-2 does not respond to (Emergency Feedwater Actuation Signal) EFAS. 2CV-1076-2 does not respond to EFAS.

<table>
<tr><th colspan="3">Simulator Instructions for Scenario 3</th></tr>
<tr><td>At T=0</td><td></td><td>Pump the Reactor Drain Tank</td></tr>
<tr><td colspan="3">Cue: When contacted as the NLO, then respond to the request and use remote function BMS2P41A to start the RDT pump and then inform the CR 2P-41A is running.
Cue: When contacted as the NLO, then respond to the request and use remote function BMS2P41A to stop the RDT pump and then inform the CR 2P-41A is secured.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger T1</td><td>‘A’ Pressurizer Level channel fails high. TS for SRO.</td></tr>
<tr><td colspan="3">Cue: If contacted as a NLO to post start checks on the charging pumps, then after 2 min. report post start/stop checks are sat.
Cue: If contacted as RP that letdown is elevated, then acknowledge the information.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed level instrument.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger T2</td><td>‘B’ Circulating Water pump trips.</td></tr>
<tr><td colspan="3">Cue: When contacted as the NLO, then after 5 min. report that 2P-3B has an acrid odor.
Cue: When contacted as the NLO, then after 2 min. report the 2P-3B breaker (2H-20) has over current drop flags.
Cue: When contacted as the NLO to perform post start checks on B vacuum pump, then after 2 min. report post start checks for 2C-5B Vacuum pump.
Cue: When contacted as chemistry, then report that chemistry will sample for iodine at the time requested.
Cue: When contacted as the WWM, then report that a planner will begin planning work on 2P-3B.</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger T3</td><td>A 7 gpm LOCA starts on the ‘A’ RCS cold leg. TS for SRO.</td></tr>
<tr><td colspan="3">Cue: When contacted as RP, acknowledge that the crew will be restoring letdown.
Cue: If contacted as NLO to check 2CVC-139 status then report 2CVC-139 fully open.</td></tr>
</table>

<table>
<tr><td colspan="3">Simulator Instructions for Scenario 3</td></tr>
<tr><td>CUED by Lead Examiner</td><td>Trigger = T4</td><td>Main Feedwater pump (MFWP) Lube oil controller temperature input fails.</td></tr>
<tr><td colspan="3">Cue: When contacted as the NLO, then report oil flows and pressure are normal but temperatures are elevated.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed temperature instrument.</td></tr>
<tr><td>CUED by Lead Examiner</td><td></td><td>2A-1 4160 Volt vital bus lockout, that propagates to a SU#3 transformer lockout.
#1 EDG loss of lube oil, and #2 EDG will overspeed trip on start causes a station blackout.</td></tr>
<tr><td colspan="3">Cue: When contacted as a NLO to investigate 2A-1, report there is an acrid odor and the overcurrent flags are dropped.
Cue: If contacted as a NLO to investigate #1 EDG, report lube oil strainer gasket has failed and #1 EDG has tripped on low oil pressure.
Cue: If contacted as a NLO to investigate #2 EDG, overspeed tripped, there is damage to the linkage to the fuel racks, and cannot be reset.
Cue: If requested as Work Management for AAC status, then report it will take 12 hours to be ready to start due to a faulty overspeed device.
Cue: When contacted as Chemistry, then report you will monitor RDACS for off site releases.
Cue: When contacted as a NLO to close the LTOP relief isolation valves, after 2 min have the booth operator close the LTOP breakers, then report the 2B51-E4, and 2B51-K2 are closed
Cue: If contacted as the dispatcher and requested report that SU2 voltage regulator is not in the 3% reduction mode, and The ANO Russellville East and Pleasant Hill East transmission lines are in service.
Cue: If contacted as a NLO then report that SU2 load shedding is enabled.
Cue: When contacted as Unit 1, report that you are NOT energizing any buses from XFMR #2.
Cue: If contacted as the AO, then report after 2 min report that the Key switches (143-2H09) at 2H-13 and (143-2A16) at 2A-111 are in normal.</td></tr>
<tr><td></td><td></td><td>2CV-1026-2 and 2CV-1076 do respond to EFAS signal.</td></tr>
<tr><td colspan="3"></td></tr>
</table>

Op-Test No.: 2017-1	Scenario #3	Event No: 1
Event Description: Lowering RDT Level – Normal Method		

Time	Position	Applicant's Actions or Behavior
	BOP	8.0 REACTOR DRAIN TANK OPERATIONS 8.1 Lowering RDT Level – Normal Method
		NOTE If the RDT is vented to atmosphere, RDT level response can be improved by verifying Containment sump level less than or equal to 50%. This improves RDT level response due to uncovering the RDT vent line inside the Containment sump.
	BOP	*8.1.1 Verify system aligned IAW System Alignment Verification section of 1015.001, Conduct of Operations.
	BOP	*8.1.2 IF NOT vented to atmosphere, THEN use applicable "Adding N2 to RDT" step of this procedure to maintain greater than 1 psig nitrogen overpressure in RDT. (CR-ANO-2-2000-0208) **Examiner Note: RDT is not vented to atmosphere however pressure is high and needs to be lowered by pumping and should not require N2 addition.**
	BOP	*8.1.3 Monitor the following: • Reactor Drain Tank level (2LIS-2200/L2200) • Reactor Drain Tank pressure (2PIS-2200/P2200)
	BOP	8.1.4 Verify at least ONE BMS Holdup Tank Inlet valve open: • 2T-12A Inlet 2CV-2230 (2HS-2230) • 2T-12B Inlet 2CV-2231 (2HS-2231) • 2T-12C Inlet 2CV-2232 (2HS-2232) • 2T-12D Inlet 2CV-2233 (2HS-2233) **Examiner Note: 2T-12B inlet valve is open.**
	BOP	8.1.5 Open the following valves: • RDT Pump Suction 2CV-2201-2 (2HS-2202-2) • RDT Pump Suction 2CV-2202-1 (2HS-2202-1)

Op-Test No.: 2017-1	Scenario #3	Event No: 1
Event Description: Lowering RDT Level – Normal Method		

Time	Position	Applicant's Actions or Behavior
	BOP	Directs the NLO to perform step 8.1.6 8.1.6 Start ONE or BOTH Reactor Drain Pumps: • RDT Pump 2P-41A (2HS-2205) • RDT Pump 2P-41B (2HS-2204)
Cue: When contacted as the NLO, then respond to the request and use remote function BMS2P41A to start the RDT pump and then inform the CR 2P-41A is running.		
<u>NOTE</u> Reactor Drain Pumps automatically secure at 20.8% RDT level (2LIS-2200)		
	BOP	Direct the NLO to stop RDT pump if RDT pressure approaches 1 psig. *8.1.7 IF required to maintain greater than 1 psig in the Reactor Drain Tank (2PSI-2200/P2200), THEN cycle Reactor Drain Pump (s) as necessary: • RDT Pump 2P-41A (2HS-2205) • RDT Pump 2P-41B (2HS-2204)
	BOP	Direct the NLO to perform step 8.1.8 8.1.8 WHEN Reactor Drain Tank reaches desired level, THEN stop Reactor Drain Pump(s): • RDT Pump 2P-41A (2HS-2205) • RDT Pump 2P-41B (2HS-2204)
Cue: When contacted as the NLO, then respond to the request and use remote function BMS2P41A to stop the RDT pump and then inform the CR 2P-41A is secured.		
	BOP	8.1.9 Close the following valves: • RDT Pump Suction 2CV-2201-2 (2HS-2201-2) • RDT Pump Suction 2CV-2202-1 (2HS-2202-1)
Termination criteria: When the containment sump has been drained at least once or at lead examiner's discretion.		

Op-Test No.: 2017-1	Scenario #3	Event No: 2
Event Description: 'A' Pressurizer Level Channel Fails Low. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce alarms: • 2K10-G6 CNTRL CH 1 LEVEL LO • 2K10-F6 CNTRL CH 1 LO LO Report 2LI-4627-2 and 2LR-4625 indicate normal.
Enter and implement AOP 2203.028, PZR Systems Malfunctions.		
	SRO	1.E. Check the following PZR level annunciators clear: • "CNTRL CH 1/2 LEVEL LO" 2K10-G6/G7 • "CNTRL CH 1/2 LEVEL HI" 2K10-J6/J7 **Annunciators not clear, implement contingency, GO TO Step 7**
	ANY	7. Check the following PZR level annunciators clear: • "CNTRL CH 1/2 LEVEL LO" - 2K10-G6/G7 • "CNTRL CH 1/2 LEVEL HI" - 2K10-J6/J7 **(2K10-G6 not clear, implement contingencies)**
	ANY	**7. Perform the following:** A. Compare PZR level instruments to determine the affected channel.
		B. IF BOTH PZR level control channels failed, THEN **GO TO** Step 8 **Examiner Note: Contingency B is N/A**
	ATC	C. IF selected control channel failed, THEN perform the following: 1) Perform the following for Letdown Flow controller (2HIC-4817): a) Place controller in MANUAL. b) Adjust output to control PZR level within 5% of setpoint.
	ATC	2) Place PZR Level Channel Select switch (2HS-4628) to unaffected channel. **(Channel 2 / B)**

Op-Test No.: 2017-1	Scenario #3	Event No: 2
Event Description: 'A' Pressurizer Level Channel Fails Low. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
	ATC	3) Place PZR Low Level Cutoff select switch (2HS-4642) to unaffected channel. **(Channel B)**
	ANY	4) Verify PZR heaters and Normal Spray operating to restore RCS pressure 2025 to 2275 psia.
	ATC	5) WHEN Letdown Flow controller (2HIC-4817) automatic AND manual signals match, THEN restore 2HIC-4817 controller to AUTO using 2104.002 Chemical and Volume Control. **Examiner Note: This step does not have to be completed to proceed to the next malfunction.**
Cue: If contacted as a NLO to post start checks on the charging pumps, then after 2 min. report post start/stop checks are sat. **Cue: If contacted as RP that letdown is elevated, then acknowledge the information.**		
	ATC	D. IF non-selected control channel failed, THEN perform the following: **Examiner Note: This step is N/A**
	ATC	E. IF Letdown Radiation monitor isolated due to high temperature AND Letdown HX Outlet temperature lowered to less than 140°F, THEN restore Letdown Radiation Monitor flow by opening Letdown Rad Monitor Isolation, 2CV-4804 (2HS-4804).
	SRO	F. Refer to TS 3.3.3.5, Remote Shutdown Instrumentation and 3.3.3.6, Post-Accident Instrumentation. **Examiner Note: SRO must enter Tech Spec 3.3.3.6 action 1 for Post Accident Instrumentation.**
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed level instrument.		
Termination Criteria: PZR level control selected to channel 2 or at lead examiner's discretion.		

Op-Test No.: 2017-1	Scenario #3	Event No: 3
Event Description: 'B' Circulating Water pump trips.		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce alarm: 2K12-A9 CIRC WTR SYS POTENTIAL FAILURE.
	ANY	Report 2P-3B is tripped and the discharge valve is closing / closed.
Enter and implement AOP 2203.019, Loss of Condenser Vacuum.		
NOTE • Steps marked with (*) are continuous action steps. • Steps marked with **(■)** are floating steps.		
	SRO	1. Open Placekeeping page. 2. Notify Control Board Operators to monitor floating steps. 3. Check procedure entered due to loss of OR reduced Circulating Water flow.
	BOP	4. Verify Circ Water pump operation as follows: • At least ONE Circ Water pump (2P3A/B) running. • ANY stopped Circ Water Pump associated Discharge valve closed. 2P3A: 2CV-1224 2P3B: 2CV-1215
Cue: When contacted as the NLO, then after 5 min. report that 2P-3B has an acrid odor. **Cue: When contacted as the NLO, then after 2 min. report the 2P-3B breaker (2H-20) has over current drop flags.**		
NOTE Main Feedwater pumps trip at Condenser vacuum of 13.4 inches HG Abs. Turbine Generator trips at Condenser vacuum of 7.0 inches HG Abs. SDBCS Condenser Interlock automatically resets at 5.15 inches HG Abs, with controllers in automatic.		

Op-Test No.: 2017-1	Scenario #3	Event No: 3
Event Description: 'B' Circulating Water pump trips.		

Time	Position	Applicant's Actions or Behavior
	BOP	■5. Check Condenser Vacuum less than 7 inches HG Abs.
	BOP	■6. Check Condenser Vacuum stable or improving.
	SRO	**Direct Step 6 Contingencies.** ■6. Perform the following:
	ATC	A. Commence Emergency Boration using 2202.010 Exhibit 1, Emergency Boration
2202.010 Exhibit 1, Emergency Boration		
Exhibit 1 Emergency Boration	ATC	1. Select ONE of the following Emergency Boration flowpaths: **FLOWPATH** / **ACTIONS REQUIRED** A. Gravity Feed — A. Verify at least ONE BAM Tank Gravity Feed valve open: • 2CV-4920-1 • 2CV-4921-1 B. BAM pumps — B. 1) Start at least ONE BAM pump. 2) Open Emergency Borate valve (2CV-4916-2). 3) Verify Boric Acid Makeup Flow Control valve (2CV-4926) closed. **CAUTION** **Aligning Charging pump suction to RWT during RWT purification with ALL Charging pumps running may cause Charging pumps to trip due to low suction pressure.** C. RWT to Charging pumps — C. Open Charging Pump Suction Source From RWT valve (2CV-4950-2). **Examiner Note: Gravity Feed is the normal method used for a Circulating water pump trip.**

Op-Test No.: 2017-1	Scenario #3	Event No: 3
Event Description: 'B' Circulating Water pump trips.		

Time	Position	Applicant's Actions or Behavior
Exhibit 1 Emergency Boration	ATC	2. Close VCT Outlet valve (2CV-4873-1).
	ATC	3. IF VCT Outlet valve does NOT close, THEN verify BAM Pumps Emergency Boration flowpath selected.
	ATC	4. Verify Reactor Makeup Water Flow Control valve (2CV-4927) closed.
	ATC	5. Verify at least ONE Charging pump running and charging header flow greater than 40 gpm.
	ATC	6. Verify charging header flow greater than 40 gpm by either of the following: • 2FIS-4863 Disch Flow (2C09) • Computer Point F4863 (PDS or SPDS)
Returns to Step 6, Contingency Actions		
	BOP	B. Perform Attachment A, Backpressure and Temperature Limits.
	ATC	C. IF CEA insertion necessary to maintain Tc less than 554.7°F, THEN perform the following: 1) PERFORM insertion of Group 6 or Group P CEAs using 2105.009 Exhibit 3. 2) Maintain CEAs in Acceptable region of COLR.
	SRO	D. IF RCS Tc exceeds 554.7°F, THEN refer to TS 3.2.6 Reactor Coolant System Cold Leg temperature.
	ATC	E. WHEN Condenser Vacuum stable or improving, THEN secure Emergency Boration.
Cue: When contacted as the NLO to perform post start checks on B vacuum pump, then after 2 min. report post start checks for 2C-5B Vacuum pump.		
2202.010 Exhibit 1, Emergency Boration		

Op-Test No.: 2017-1	Scenario #3	Event No: 3
Event Description: 'B' Circulating Water pump trips.		

Time	Position	Applicant's Actions or Behavior
		NOTE Reactor Engineering assistance may be required to determine shutdown margin.
Secure Emergency Boration	ATC	7. WHEN boron concentration greater than minimum required for shutdown margin, THEN perform the following: A. Verify VCT level ≥ 20%. B. Place VCT Outlet valve (2CV-4873-1) in AUTOMATIC. C. WHEN 2CV-4873-1 open, THEN perform the following: 1) Verify BOTH BAM pumps secured. 2) Verify the following valves closed: • 2CV-4920-1 • 2CV-4921-1 • 2CV-4916-2 3) IF 2CV-4950-2 was opened, THEN place handswitch in AUTOMATIC and check that valve closes.
		Returns to Step 6, Contingency Actions
	ATC	G. Perform the following: 1) Refer to Attachment B, Circ Water Temperature Limiting Rx Power Levels, for a suggested maximum power level for the present Circ Water inlet temperature. 2) Commence a power reduction using 2102.004, Power Operations until condenser pressure is less than 5.15 inches HG Abs.
	SRO	*7. Check RCS pressure 2025 to 2275 psia.
	ANY	*8. Check RCS TC 542 to 554.7°F using CPC PID 5, 6, 160, or 161.
	ANY	*9. Maintain ASI within limits as specified in Core Operating Limits Report (COLR).

Op-Test No.: 2017-1	Scenario #3	Event No: 3
Event Description: 'B' Circulating Water pump trips.		

Time	Position	Applicant's Actions or Behavior
	ANY	*10. Check CEA positions as follows: A. ALL Regulating Group 6 CEAs greater than 112.5 inches withdrawn. B. ALL Regulating Group 1 through 5 CEAs fully withdrawn. C. ALL Group P CEAs greater than 135 inches withdrawn.
	ANY	*11. Check PZR level within 5% of setpoint.
	ANY	12. Notify Chemistry to perform the following: A Sample for RCS Iodine within 2 to 6 hours following Reactor power change greater than 15% in any one hour, refer to TS 3.4.8, Specific Activity. B Monitor Secondary system chemistry.
Cue: When contacted as chemistry, then report that chemistry will sample for iodine at the time requested.		
	SRO	13. Perform EITHER of the following as directed by Operations Management: A. Maintain Plant conditions using 2102.004, Power Operation. B. IF plant shutdown to be performed, THEN perform the following: Examiner Note: Plant shutdown should not be performed.
Cue: When contacted as the WWM, then report that a planner will begin planning work on 2P-3B.		
Termination criteria: When Emergency Boration has been secured or at lead examiner's discretion.		

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Determine that a RCS leak is occurring by monitoring RCS and CNTMT parameters.
		AOP, OP-2203.016 Excess RCS Leakage
		NOTE **Steps marked with (*) are continuous action steps.** **Steps marked with (■) are floating steps.**
	SRO	Enter and direct the actions of: 1. Open Placekeeping page.
	SRO	2. Notify Control Board Operators to monitor floating steps.
	ANY	*3. Determine RCS leakrate by ANY of the following: • Computer LKRT programs. • Check PZR level stable and use Charging and Letdown mismatch minus Controlled Bleed Off. • Check Letdown isolated and estimate RCS leak rate by total Charging flow minus Controlled Bleed Off. • CNTMT Sump level rate of rise.
	ATC	*4. Maintain PZR level within 5% of setpoint by performing the following as necessary: A. Cycle Charging pumps. B. Isolate Letdown as follows: 1) Verify at least ONE Letdown Isolation valve closed: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred) 2) Record Charging Header Data in 2202.010 Attachment 44, Charging Header Data.

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the ‘A’ RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ANY	*5. IF in Modes 1 OR 2, THEN check PZR level maintained within 10% of setpoint.
		<u>CAUTION</u> Aligning Charging pump suction to RWT during RWT purification with ALL Charging pumps running may cause Charging pumps to trip due to low suction pressure.
	ATC	*7. Maintain VCT level 60 to 75%, refer to 2104.003, Chemical Addition.
	BOP	■ 8. IF RCS leakage greater than 44 gpm AND in Mode 1 OR 2, THEN perform the following: A. Trip Reactor. B. Actuate SIAS. C. Actuate CCAS. D. GO TO 2202.001, Standard Post Trip Actions. **Examiner Note: This step is NA, leakrate is ~ 7 gpm**
	SRO	*10. Refer to 1903.010, Emergency Action Level Classification. (Directs the Shift Manager to evaluate EALs)
	SRO	*11. <u>IF</u> location of leak known, <u>THEN</u> perform the applicable following steps (12.A through 12.J): • CNTMT step 12.A
		<u>NOTE</u> If this step entered from step 11, then only perform substep for identified leak path.

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ATC	*12. IF location of leak unknown, THEN locate and isolate leak as follows: A. Check the following CNTMT parameters stable or lowering: • Humidity (Dewpoint temperature) • Sump level • Temperature • Pressure **Examiner Note: CNTMT parameters will not be stable.**
	SRO	**Directs step 12 - A. Contingency Actions** A. Perform the following: 1) IF leakage is within allowable limits of TS 3.4.6.2, THEN attempt to locate leak in CNTMT by monitoring CAMS suction points and CNTMT Area Radiation monitors. 2) Verify leak NOT in Letdown line inside CNTMT by performing the following: a) Isolate Letdown by verifying at least ONE Letdown Isolation valve closed: • 2CV-4820-2 • 2CV-4821-1 • 2CV-4823-2 (least preferred) b) IF RCS leakage NOT stopped, THEN letdown may be restored at discretion of SM using 2104.002, Chemical and Volume Control.
2104.002, Chemical and Volume Control		
	ANY	9.2 Restoring Letdown Flow (After Temporary Isolation) 9.2.1 Notify Radiation Protection of changing Letdown alignment. (CR-ANO-2-2002-00249)
Cue: When contacted as RP, acknowledge that the crew will be restoring letdown.		

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ATC	9.2.2 IF Letdown Flow controller (2HIC-4817) NOT in MANUAL THEN transfer to MANUAL as follows: 1. Match MANUAL signal to AUTOMATIC signal. 2. Transfer controller from AUTOMATIC to MANUAL. 9.2.3 Using Letdown Flow controller (2HIC-4817), verify Letdown Flow Control valves closed: • 2CV-4816 • 2CV-4817
	ATC	9.2.4 Verify Letdown Pressure controller (2PIC-4812) in MANUAL. 9.2.5 Verify 2HS-4812 selected to desired valve(s) to be placed in service: • 2CV-4810 • 2CV-4811 • BOTH 9.2.6 Verify valve(s) selected on 2HS-4812 (2CV-4810/2CV-4811) fully open using 2PIC-4812.
	ATC	9.2.7 Verify Letdown Isolation 2CV-4820-2 (2HS-4820-2) open. 9.2.8 Verify Regen Hx Inlet 2CV-4821-1 (2HS-4821-1) open. 9.2.9 Verify Letdown Regen Hx Outlet valve 2CV-4823-2 (2HS-4823-2) open.

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
		NOTE If LD/DI 2T-36A/B, 2T-70 Inlet/Bypass (2CV-4803) has been actuated it must be taken to BYPASS and then back to AUTO/ION EXCH to restore flow through the Ion Exch.
	SRO	Contact work management.
	ATC	9.2.10 Verify LD/DI 2T-36A/B, 2T-70 Inlet/Bypass (2CV-4803) hand switch (2HS-4803) in AUTO/ION EXCH: 9.2.11 Verify 2F-3A/B Inlet Isolation (2CVC-139) fully open.
Cue: If contacted as NLO to check 2CVC-139 status then report 2CVC-139 fully open.		
	ATC	9.2.12 Verify CCP running (2FIS-4863).
	ATC	9.2.13 Verify Letdown Rad Monitor Isolation (2CV-4804) open.
		CAUTION High Pressure Letdown Relief valve (2PSV 4822) lifts at 600 psia
	ATC	9.2.14 Verify 2HS-4817 selected to desired valve(s) to be placed in service: • 2CV-4816 • 2CV-4817 • BOTH

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ATC	9.2.15 Using Letdown Flow controller (2HIC-4817) slowly open 2CV-4816/2CV-4817 to initiate flow. 9.2.16 Using Letdown Pressure controller (2PIC-4812) slowly close 2CV-4810/2CV-4811 to establish desired pressure: • IF RCS pressure < 450 psia, THEN maintain L/D backpressure (2PIC-4812) above saturation for letdown temperature (2TI-4820). • IF RCS pressure > 450 psia, THEN maintain L/D backpressure (2PIC-4812) at setpoint (normal setpoint is 350 psig). 9.2.17 WHEN letdown pressure at desired setpoint, THEN Letdown Pressure controller (2PIC-4812) may be placed in AUTO.
	ATC	*9.2.18 Using Letdown Flow controller (2HIC-4817) manually adjust 2CV-4816/2CV-4817 position to maintain desired pressurizer level. 9.2.19 Check L/D backpressure controller (2PIC-4812) maintained at setpoint.
	ATC	9.2.20 Establish 0.5 to 1.5 gpm flow through Rad Monitor Flow Indicator (2FIS-4807) IAW Letdown Line Radiation Monitor Flow Control section of this procedure.
Transition back to 2203.016 Excess RCS Leakage		
	SRO	*13. Check leakage within allowable limits, refer to TS 3.4.6.2, Reactor Coolant System Leakage. **Examiner Note: SRO must enter LCO 3.4.6.2, action b. Unidentified leakage is greater than 1 gpm.**

Op-Test No.: 2017-1	Scenario #3	Event No: 4
Event Description: A 7 gpm LOCA starts on the 'A' RCS cold leg. (Tech Spec for SRO)		

Time	Position	Applicant's Actions or Behavior
	ALL	**Directs step 13 Contingency Actions** *13. Perform the following: A. Continue efforts to locate and isolate leak. B. IF plant shutdown required, THEN perform the following: 1) Refer to applicable reactivity plan. 2) IF leakage less than 10 gpm, THEN perform EITHER of the following using 2102.004, Power Operations: • RCS boration using 2104.003, Chemical Addition, Attachment R, RCS Boration from the RWT or BAMT. • RCS boration using 2104.003, Chemical Addition, Exhibit 3, Normal RCS Boration at Power. 3) IF leakage greater than or equal to 10 gpm THEN perform RCS boration using 2104.003, Chemical Addition, Attachment R, RCS Boration from the RWT or BAMT using 2102.004, Power Operations. C. WHEN Reactor shutdown AND 2202.001, Standard Post Trip Actions completed, THEN **GO TO** Step 16.

Termination Criteria: When Letdown is restored and the SRO has addresses Tech Specs or at the discretion of the lead examiner.

Op-Test No.: 2017-1	Scenario #3	Event No.: 5
Event Description: Feedwater pump ‘A” Lube oil controller temperature input fails high.		

Time	Position	Applicant's Actions or Behavior
Triggered the same time as event 3.	ANY	Announce annunciators: 2K03-D8 TURB BRG OIL TEMP HI 2K03-E8 TURB BRG METAL TEMP HI 2K03-D11 TURB BRG OIL TEMP HI 2K03-E11 TURB BRG METAL TEMP HI
Examiner Note: 2K03-D8 and 2K03-D11 have the same guidance below. 2K03-E8 and 2K03-E11 have similar guidance but the oil temperature annunciators are more applicable.		
	ANY	Implement Annunciator Corrective Action OP-2203.012C Annunciator 2K03 Corrective Action 2.1 Dispatch Operator to locally check MFP turbine (2K-2A) Bearing temperature, oil flows and pressure. Refer to Main Feedwater Pump and FWCS Operations (2106.007).
Cue: When contacted as the NLO, then report oil flows and pressure are normal but temperatures are elevated.		
	BOP	2.2 Check MFP turbine (2K-2A) Bearing Inlet Oil temperature: • Computer point T0374 (available on PMS 2P-1A screen) • MFP Bearing/Oil Temperature recorder 2TRS-0325 (2TE-0374) - #5, 2K-2A LO TO BRG
	BOP	2.3 Validate alarm using trending capability of PMS/PDS – 2P-1A screen and/or results of local inspection. 2.3.1 IF alarm is determined to be invalid, THEN no further action required.

Op-Test No.: 2017-1	Scenario #3	Event No.: 5
Event Description: Feedwater pump ‘A” Lube oil controller temperature input fails high.		

Time	Position	Applicant's Actions or Behavior
	BOP	2.4 Check MFP LO Temp controller (2TIC-5283) operating properly: 2.4.1 IF MFP LO Temp controller (2TIC-5283) NOT operating properly, THEN perform the following: A. Place MFP LO Temp controller (2TIC-5283) in manual. B. Control MFP LO Temp controller (2TIC-5283) to maintain temperature less than 135°F.
	BOP	2.5 IF necessary, THEN verify CCW aligned to in service Lube Oil cooler per Component Cooling Water System Operations (2104.028). **Examiners Note: CCW alignment verification should not be required.**
	BOP	2.6 Shift LO coolers as necessary using Main Feedwater Pump and FWCS Operations (2106.007). **Examiners Note: Shifting LO coolers is not necessary.**
	BOP	2.7 IF bearing oil temperature can NOT be lowered, THEN reduce load on MFW pump 2P-1A IAW Power Operations (2102.004). **Examiners Note: Temperature can be lowered.**
	BOP	3.0 TO CLEAR ALARM 3.1 Reduce MFP Turbine 2K-2A Bearing Inlet supply oil temperature < 135°F.

Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed temperature instrument.
Termination Criteria: 2K03-D8 TURB BRG OIL TEMP HI alarm is clear or at lead examiner's discretion.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Report 2A-1 bus Lockout.
Cue: When contacted as a NLO to investigate 2A-1, report there is an acrid odor and the overcurrent flags are dropped.		
	SRO	Direct BOP/ATC to trip reactor.
	ATC BOP	Trip the Reactor.
Enter and implement EOP 2202.001, Standard Post Trip Actions.		
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required. 2. Open Safety Function Tracking page.
Reactivity Control	ATC	3. Check Reactivity Control established as follows: A. Reactor power lowering. B. Check startup rate is negative. C. ALL CEAs fully inserted by observing ANY of the following: 1) CEA Rod bottom lights illuminated. 2) CEAC 1 indicates ALL CEAs fully inserted. 3) CEAC 2 indicates ALL CEAs fully inserted.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Check Main Turbine tripped by BOTH of the following: • ALL Main Stop Valves closed. • Generator megawatts indicate zero. B. Generator Output breakers open. C. Perform EITHER of the following as required: **(Not met, perform contingency)** 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462 **C. Close MSIVs: (Contingency Action)** • **2CV-1010-1** • **2CV-1060-2** D. At least ONE 6900v AC bus energized E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized. **(Not met, perform contingency)**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries	BOP	**Evaluator Note: Contingency Actions cannot be accomplished, neither DG is available: #1 EDG has a loss of lube oil and #2 EDG had an overspeed trip on the start signal. NO 4160v or 480v Vital AC bus is energized.** **F. Perform the following: (Contingency Actions)** **1) IF de-energized 4160v Vital AC bus available AND associated EDG available, THEN verify associated EDG supplying bus. (EDG's are not available)** **2) IF NEITHER DG available, THEN start AACG AND align to associated 4160v Vital bus using 2104.037, Alternate AC Diesel Generator Operations, Attachment E. (AAC overspeed)** **3) Check at least ONE 4160v and 480v Vital AC bus energized.** G. BOTH DGs secured. H. At least ONE 125v Vital DC bus energized: • 2D01 - SPDS point E2D01 • 2D02 - SPDS point E2D02

Cue: If contacted as a NLO to investigate #1 EDG, report lube oil strainer gasket has failed and #1 EDG has tripped on low oil pressure.

Cue: If contacted as a NLO to investigate #2 EDG, overspeed tripped, there is damage to the linkage to the fuel racks, and cannot be reset.

Cue: If requested as Work Management for AAC status, then report it will take 12 hours to be ready to start due to a faulty overspeed device.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
RCS Inventory Control	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: • 10 to 80%. • Trending to setpoint. **(May not be met due to RCS leak, may be trending up due to RCS heat up, review contingencies)** B. RCS MTS 30°F or greater.
RCS Inventory Control	SRO	**Direct the following as necessary:** **A. Perform as necessary:** **1) <u>IF</u> SIAS actuated on PPS inserts, <u>THEN</u> GO TO Step 6.** **2) Verify PZR Level Control system restoring level to setpoint.**
RCS Pressure Control	ATC	6. Check RCS Pressure Control: • 1800 to 2250 psia. • Trending to setpoint. **(May not be met due to RCS leak or heatup, perform contingency as required)** • Normal PZR Spray and heater controlling pressure **(Not met due to Loss of power, perform contingency)** • Valid CNTMT Spray NOT in progress.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
RCS Pressure Control	SRO	**Direct the following contingency actions as necessary:** **6. Perform as necessary:** **D. <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.** • **RCP A Spray Valve (2CV-4651)** • **RCP B Spray Valve (2CV-4652)** **E. <u>IF</u> ALL RCPs stopped <u>AND</u> RCS pressure control required, <u>THEN</u> initiate Aux spray using 2202.010 Attachment 48, RCS Pressure Control.** **G. Verify PZR Pressure Control system restoring pressure to setpoint.**
Core Heat Removal	ATC	7. Check Core Heat Removal by forced circulation: A. At least ONE RCP running. **(RCPs will be secured due Loss of power and CRS should perform the contingency)**
	ATC	**Direct the contingency for step 7. A** **A. IF ALL RCPs stopped, THEN perform the following:** **1) Verify BOTH PZR Spray valves in MANUAL and closed.** **2) GO TO Step 8.**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal	ANY	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level. **(Not met, perform contingency)** B. Check MFW in RTO **(Not met, contingency is satisfied)** C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check RCS TC 540 to 555°F. **(May not be met perform contingency if not met.)** E. Check SG pressure 950 to 1050 psia. **(Not met perform contingency)**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal	ANY	**A. Perform the following: (Contingency Actions)** **1) IF SG level lowering, THEN verify EFAS actuated.** **B. Verify EITHER of the following:** • **BOTH MFW pumps tripped.** • **SG levels controlling at setpoint** **D. Perform as necessary:** **1) IF TC greater than 555° F, THEN perform the following:** **a) Verify level being restored to at least one SG.** **b) Verify SDBCS restoring T_C 540°F to 555°F using 2105.008 Exhibit 3, SDBCS Emergency Operation.** **c) IF SDBCS NOT restoring T_C, THEN check MSSVs operating to control SG pressure 1050 psia to 1100 psia.** **E. Perform as necessary:** **2) Verify SDBCS restoring SG pressure 950 psia to 1050 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation.** **4) IF SG pressure greater than 1050 psia, THEN check MSSVs operating to control SG pressure 1050 psia to 1100 psia.** **Examiner Note: SG pressure cannot be control from the control room due to the loss of power.**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
Cntmt	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: • CNTMT Area **(Not met due to RCS leak)** • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room. 11. Direct NLOs to perform 2202.010 Attachment 47, Field Operator Post trip actions. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL critical alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** **15. IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following:** **A. Notify control room staff of safety functions NOT satisfied.** **B. GO TO Exhibit 8, Diagnostic Actions.**
	SRO	Diagnose Functional Recovery EOP 2202.009
		Enters and Implements Functional Recovery Procedure, 2202.009
		NOTE Parameters in brackets [ ] reflect normal values corrected for harsh CNTMT environment with CNTMT temperature greater than 200°F or CNTMT radiation greater than 10^5 R/hr.
	SRO	*1. Notify Shift Technical Advisor to perform Safety Function Status Checks for appropriate success paths at the following times: • Initially after appropriate success paths identified • Every 15 minutes thereafter.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	SRO	2. Record present time: • Time _____________.
	SRO	*3. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	*4. Check RCS pressure greater than 1400 psia.
	SRO	*5. Verify the following for any operating RCP: A. CSAS NOT actuated. B. Proper seal staging. C. CCW aligned. **Examiner Note: No RCPs are operating**
	SRO	*6. IF SIAS or MSIS actuated, THEN perform the following: **Examiner Note: SIAS and MSIS should not be actuated.**
	SRO	7. IF CCW in service to provide SG Sample Cooler cooling, THEN perform the following: A. IF SG "A" has indicated water level, THEN verify the following SG 'A' Sample Valves open: • 2CV-5850 • 2CV-5852-2 B. IF SG "A" has indicated water level, THEN verify the following SG 'A' Sample Valves open: • 2CV-5858 • 2CV-5859-2 C. Notify Chemistry to sample available SGs for activity. **Examiner Note: CCW is not available**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	SRO	8. Check ALL available Hydrogen Analyzers in service using 2104.044, Containment Hydrogen Control Operations. **(Not met, perform contingency)**
	ANY	**8. Verify all available Hydrogen Analyzers in service within 70 minutes from start of event.** *** Record time from Entry Section step 2:** **Time______________**
	SRO	9. Open Functional Recovery Success Path Tracking page.
	SRO	10. Notify Control Board Operators to perform the following: A. Monitor floating steps. B. Verify actuated ESFAS components using 2202.010 Exhibit 9, ESFAS Actuation.
	ANY	11. Determine safety function status as follows: A. Check Reactivity Control satisfied by EITHER of the following: • Maximum of ONE CEA NOT fully inserted and Reactor power lowering. • Reactor power less than 10-1% and stable or lowering. **Examiners note: Reactivity will be satisfied.**

Op-Test No.: 2017-1 Scenario #3 Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	ANY	B. Check Vital DC Auxiliaries satisfied: 1) At least ONE 125v Vital DC bus energized: • 2D01-SPDS point E2D01 • 2D02-SPDS point E2D02 2) At least ONE 120v Vital AC bus energized: • 2RS1 - SPDS point E2RS1 or E2RS1RS3 • 2RS2 - SPDS point E2RS2 or E2RS2RS4 • 2RS3 - SPDS point E2RS3 or E2RS1RS3 • 2RS4 - SPDS point E2RS4 or E2RS2RS4 **Examiners note: Vital DC will be satisfied.**
	ANY	C. Check Vital AC Auxiliaries satisfied: 1) At least ONE 4160v Vital AC bus (2A3/2A4) energized. **Examiners note: Vital AC will NOT be satisfied.**
	ANY	D. Check RCS Inventory Control satisfied: 1) CVCS maintaining PZR level 10 to 80% [40 to 70%] and level stable or trending to setpoint. 2) RCS MTS 30°F or greater. 3) RVLMS LVL 03 or higher elevation indicates WET. **Examiners note: Inventory Control will NOT be satisfied due to power loss.**

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		
Time	**Position**	**Applicant's Actions or Behavior**
	ANY	E. Check RCS Pressure Control satisfied: 1) RCS pressure maintained within P-T limits, refer to Attachment 1, P-T Limits. **Examiners note: P-T limits should be satisfied.**
	ANY	F. Check RCS and Core Heat Removal satisfied: 1) At least ONE intact SG available for Heat Removal by EITHER of the following: • Level 10 to 90% [20 to 90%] with FW available. • Level being restored with total FW flow of 485 gpm or greater. 2) IF ANY RCP operating, THEN RCS ΔT less than 10°F and NOT rising. 3) IF ALL RCPs secured, THEN RCS ΔT less than 50°F and NOT rising. 4) RCS T_C less than 555°F and NOT rising. 5) RCS MTS 30°F or greater. 6) RVLMS LVL 01 indicates WET. **Examiners note: RCS and Core Heat Removal may not be satisfied due to Tc.**

Op-Test No.: 2017-1 Scenario #3 Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	ANY	G. Check CNTMT Isolation satisfied: 1) CNTMT parameters normal: a) "CNTMT RADIATION HI" annunciator (2K10-A6) clear. b) NO unexplained rise in CNTMT radiation. c) CNTMT pressure less than 18.3 psia. 2) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 3) NO unexplained rise in Secondary Systems Radiation monitor trends: • Main Steam lines • SG Sample • Condenser Off Gas **Examiners note: Not met due to the RCS leak.**
	ANY	H. Check CNTMT Temperature and Pressure Control satisfied: 1) CNTMT pressure less than 16 psia. 2) CNTMT temperature less than 140°F. **Examiners note: CNTMT Temperature and Pressure Control should be satisfied.**
	ANY	12. Locally remove danger tags and close the following breakers. • 2B51-E4 “LTOP RELIEF ISOL 2CV-4730-1” • 2B51-K2 “LTOP RELIEF ISOL 2CV-4741-1”

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		

Time	Position	Applicant's Actions or Behavior
Cue: When contacted as a NLO to close the LTOP relief isolation valves, after 2 min have the booth operator close the LTOP breakers, then report the 2B51-E4, and 2B51-K2 are closed		
		*13. Check ALL Safety Function acceptance criteria satisfied. **Examiners note: Perform Contingency Actions.**
	SRO	***13. Perform the following:** **A. Determine appropriate success paths using Success Path Decision Trees.** **B. Initiate success paths for ALL Safety Functions in the following order:** **1) Jeopardized.** **2) Challenged.** **3) Satisfied.** **C. <u>IF</u> higher priority Safety Function jeopardized <u>AND</u> lower priority safety function success path in progress, <u>THEN</u> GO TO appropriate success path for highest priority safety function in jeopardy.** **D. <u>WHEN</u> success path implemented for EACH Safety Function, <u>THEN</u> RETURN TO Step 14 of Entry procedure.** **Examiner Note: The SRO will complete the safety functions in order of hierarchy; MVAC is the highest "Jeopardized" safety function.** **SRO determines that an Offsite source and Startup transformer are available and selects MVAC-1.**
Enters and Implements MVAC-1, Startup Transformers		

Op-Test No.: 2017-1 Scenario #3 Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	BOP	1. Verify BOTH of the following: • XFMR Feeder Breaker switches for ANY de-energized bus in PTL AND breakers open. • XFMR Feeder Breaker switches for ANY de-energized power source in PTL AND breakers open. • 2H13, SU #2 Feeder to 2H1 • 2H14, Unit Aux Feeder to 2H1 • 2H15, SU #3 Feeder to 2H1 • 2H23, SU #2 Feeder to 2H2 • 2H24, Unit Aux Feeder to 2H2 • 2H25, SU #3 Feeder to 2H2 • 2A111, SU #2 Feeder to 2A1 • 2A112, Unit Aux Feeder to 2A1 • 2A113, SU #3 Feeder to 2A1 • 2A211, SU #2 Feeder to 2A2 • 2A212, Unit Aux Feeder to 2A2 • 2A213, SU #3 Feeder to 2A2
	ANY	2. Check offsite power available using 2C10 indications and System Dispatcher.

Note:

Voltage indication for SU XFMRs may indicate SU XFMRs available with associated disconnect or breaker open.

<table>
<tr><td colspan="3">Op-Test No.: 2017-1 Scenario #3 Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).</td></tr>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>ANY</td><td>3. Check EITHER SU XFMR energized from offsite power AND meets the below listed criteria for the respective transformer:
SU XFMR #3 meets EITHER of the following voltage criteria:
Greater than or equal to 22.7 KV, regulator out of service (E22ATor E9664).
Greater than or equal to 20.9 KV with regulator in service (E22AT).
<table>
<tr><th>Regulated Voltage</th><th>Unregulated Voltage</th></tr>
<tr><td>SPDS E2ST3R
PMS E9664</td><td>SPDS E22AT</td></tr>
</table>
Examiner Note: SU XFMR #3 is not available.</td></tr>
<tr><td></td><td></td><td>SU XFMR #2 with ALL of the following requirements satisfied:
Voltage greater than or equal to 161 KV with voltage regulator out of service OR voltage greater than or equal to 146 KV (E161ST2) with voltage regulator in service using the following indications:
<table>
<tr><th>Regulated Voltage</th><th>Unregulated Voltage</th></tr>
<tr><td>SPDS EST2R
PMS E4013</td><td>SPDS E161ST2</td></tr>
</table>
EITHER of the following 161 KV transmission lines in service:
ANO-Russellville East
ANO-Pleasant Hill
SU2 load shedding enabled.
No Unit 1 buses powered from SU2.
SU2 voltage regulator 3% reduction disabled.</td></tr>
</table>

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		
Time	**Position**	**Applicant's Actions or Behavior**
Cue: If contacted as the dispatcher and requested report that SU2 voltage regulator is not in the 3% reduction mode and the ANO Russellville East and Pleasant Hill East transmission lines are in service. **Cue: If contacted as a NLO then report that SU2 load shedding is enabled.** **Cue: When contacted as Unit 1, report that you are NOT energizing any buses from XFMR #2.**		
	BOP	4. Energize 6900 and 4160v Non-vital buses from available SU XFMR as follows: A. Check SU XFMR #3 available. **Examiner Note: SU XFMR #3 is not available perform contingency**
NOTE Due to SU XFMR #2 limitations it may be desirable to maintain 4160v Vital buses on DGs.		
	BOP	**A. IF SU XFMR #2 available, THEN perform the following:** **1) Energize electrical buses using 2202.010 Attachment 29, Startup XFMR #2 Usage.** **2) WHEN offsite power has been restored from SU XFMR #2, THEN GO TO Step 6.** **3) Do NOT continue.**
Go to Step 1 of Att. 29.		
	BOP	A. IF ONLY Unit 2 energizing buses from SU XFMR #2 AND Auto XFMR energized from 500 KV, THEN perform the following: B. Locally verify SU XFMR #2 load shed circuit enabled. • Key Lock Switch (143-2H09) at 2H-13 in NORMAL. • Key Lock Switch (143-2A16) at 2A-111 in NORMAL.

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		
Time	**Position**	**Applicant's Actions or Behavior**
Cue: If contacted as the AO, then report after 2 min report that the Key switches (143-2H09) at 2H-13 and (143-2A16) at 2A-111 are in normal. **Cue: When contacted as Unit 1, report that you are NOT energizing any buses from XFMR #2.**		
	BOP	B. Verify Unit 1 is NOT energizing ANY buses from SU XFMR #2.
	BOP	C. IF AFW pump 2P75 in service to satisfy Heat Removal safety function, THEN exit this attachment AND restore electrical busses to SU XFMR #2 as directed by Operations Management and Design Engineering. **Examiner Note: 2P-75 is not running.**
	BOP	D. IF 2A1 to be energized, THEN place handswitches for the following breakers in PTL: BREAKER / DESCRIPTION 2A102 / 2A1 to 2B1 2A104 / 2A1 to 2B7 2B324 / 2C-5A 2B123 / 2P33A 2B721 / 2P33C **Examiner Note: This step is NA, NOT energizing 2A1**
	BOP	E. IF 2A2 to be energized, THEN place handswitches for the following breakers in PTL: BREAKER / DESCRIPTION 2A202 / 2A2 to 2B2 2B424 / 2C-5B 2B223 / 2P33B

Op-Test No.: 2017-1	Scenario #3	Event No.: 6 & 7
Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).		

Time	Position	Applicant's Actions or Behavior
	BOP	F. Energize required Non-vital buses 2A1, 2A2, 2H1, and 2H2 from SU XFMR #2 as follows: 1) IF energizing 2A1, THEN perform the following: **Examiner Note: 2A1 is the faulted bus and will NOT be energized.** 2) IF energizing 2A2, THEN perform the following: a) Place synch switch for 2A2 Feeder breaker in ON b) Close SU XFMR Feeder breaker 2A211 to energize bus 2A2. c) Check voltage indicated on 2A2. d) Place synch switch for 2A2 Feeder breaker in OFF. e) Remove synch switch from SU XFMR Feeder breaker 2A211. **Examiner Note: Energizing 2A2**
	BOP	3) IF energizing 2H1, THEN perform the following: **Examiner Note: Not energizing 2H1.**
	BOP	4) IF energizing 2H2, THEN perform the following: **Examiner Note: Not energizing 2H2.**
CAUTION • Minimum Non-vital bus voltage during SU XFMR #2 loading is 3640v on 4160v Non-vital buses. • Minimum Non-vital bus voltage during SU XFMR #2 loading is 6010v on 6900v buses. • Minimum 480v Vital bus voltage is 436v when 4160v Vital buses energized.		
	BOP	G. IF desired to energize 4160v Vital bus 2A3, THEN perform the following: **Examiner Note: Not energizing 2A-3.**

Op-Test No.: 2017-1 Scenario #3 Event No.: 6 & 7

Event Description: (6) 2A-1 4160 Volt vital bus lockout, which will propagate to a SU#3 transformer lockout (LOOP). (7) #1 EDG loss of lube oil, #2 EDG Overspeed trip and AAC Diesel Generator is Out of Service (Station Blackout).

Time	Position	Applicant's Actions or Behavior
	BOP	H. IF desired to energize 4160v Vital bus 2A4, THEN perform the following: 1) Place synch switch for 2A4 Normal Feeder breaker in ON. 2) Hold Normal Feeder breaker (2A409) in closed position for 3 seconds. 3) Check voltage indicated on 2A4. 4) Place synch switch for 2A4 Normal Feeder breaker in OFF. 5) Remove synch switch from 2A4 Normal Feeder breaker 2A409.
CRITICAL TASK: Energize at least one vital AC bus prior to Margin to Saturation lowering below 30 degrees F.		
Returns to Step 6 of MVAC-1		
	SRO	*6. Check BOTH 4160v Vital buses energized. **(Not met)**
	SRO	***6. IF ESF equipment on energized train fails AND ESF equipment on de-energized train needed to satisfy a safety function, THEN crosstie 4160v Vital buses using 2107.002, ESF Electrical System Operation.** **Examiner Note: Crosstie should not be required.**
	ANY	7. Check acceptance criteria for Maintenance of Vital AC Power satisfied: • At least ONE 4160v Vital bus (2A3/2A4) energized.
	SRO	Transition to the next jeopardized or challenged safety function IC
Termination criteria: 4160v Vital bus 2A4 is energized or at the discretion of the lead examiner.		

Op-Test No.: 2017	Scenario # 3	Event No: 8
Event Description: 2CV-1026-2 and 2CV-1076 do not respond to EFAS signal.		

Time	Position	Applicant's Actions or Behavior
	ANY	Recognize 2CV-1026-2 is not cycling based on SG level.
	ANY	Recognize 2CV-1076-2 is not cycling based on SG level.
Examiner Note: This action should be completed during SPTAs if it is not recognized until the Functional recovery procedure the crew should use steps to restore feedwater from 2P-7A to prevent water hammering the SG feed ring.		
	BOP	Update 2CV-1026-2 and 2CV-1076 not opening as required then operate both valve to restore SG levels.
Critical Task: Restore Feedwater prior to both SG levels reaching 70” wide range.		
Termination criteria: When 2CV-1026-2, or 2CV-1039-1 open or at the discretion of the lead examiner.		

8.0 REACTOR DRAIN TANK OPERATIONS

8.1 Lowering RDT Level - Normal Method

NOTE

If the RDT is vented to atmosphere, RDT level response can be improved by verifying Containment sump level less than or equal to 50%. This improves RDT level response due to uncovering the RDT vent line inside the Containment sump.

8.1.1 Verify system aligned IAW System Alignment Verification section of 1015.001, Conduct of Operations.

* 8.1.2 IF NOT vented to atmosphere,
THEN use applicable “Adding N2 to RDT” step of this procedure to maintain greater than 1 psig nitrogen overpressure in RDT. (CR-ANO-2-2000-0208)

* 8.1.3 Monitor the following:

- Reactor Drain Tank level (2LIS-2200/L2200)
- Reactor Drain Tank pressure (2PIS-2200/P2200)

8.1.4 Verify at least ONE BMS Holdup Tank Inlet valve open:

- 2T-12A Inlet 2CV-2230 (2HS-2230)
- 2T-12B Inlet 2CV-2231 (2HS-2231)
- 2T-12C Inlet 2CV-2232 (2HS-2232)
- 2T-12D Inlet 2CV-2233 (2HS-2233)

8.1.5 Open the following valves:

- RDT Pump Suction 2CV-2201-2 (2HS-2201-2)
- RDT Pump Suction 2CV-2202-1 (2HS-2202-1)

8.1.6 Start ONE or BOTH Reactor Drain Pumps:

- RDT Pump 2P-41A (2HS-2205)
- RDT Pump 2P-41B (2HS-2204)

(Step 8.1 Continued on next page)

8.1 (Continued)

NOTE
Reactor Drain Pumps automatically secure at 20.8% RDT level (2LIS-2200).

* 8.1.7 Cycle Reactor Drain Pump(s) to maintain greater than 1 psig in the Reactor Drain Tank (2PIS-2200/P2200):

- RDT Pump 2P-41A (2HS-2205)
- RDT Pump 2P-41B (2HS-2204)

8.1.8 WHEN Reactor Drain Tank reaches desired level, THEN ensure Reactor Drain Pump(s) stopped:

- RDT Pump 2P-41A (2HS-2205)
- RDT Pump 2P-41B (2HS-2204)

8.1.9 Close the following valves:

- RDT Pump Suction 2CV-2201-2 (2HS-2201-2)
- RDT Pump Suction 2CV-2202-1 (2HS-2202-1)

Facility: ANO-2	Scenario No.: 4 (Modified)	Op-Test No.: 2017-1

Examiners:	Operators:

Initial Conditions: ~4% MOL; RED Train Maintenance Week.

Turnover: ~4%. 260 EFPD. EOOS indicates ‘Minimal Risk’. RED Train Maintenance Week. Steam Bypass valve in auto local setpoint of 1000 psia. Reactor power was reduced to ~4% for Turbine CV EH leak repair and DEFAS cabinet repair. Power is being maintained at 3 to 5%.

Evolution scheduled: Shift loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) N (SRO)	Shift Loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle. **OP-2104.029, Service Water System Operations**
2	CV4816	C (ATC) C (SRO)	Letdown flow control valve 2CV-4816 will fail closed. **OP-2203.012L, Annunciator 2K12 Corrective Action** **OP-2104.002, Chemical and Volume Control.**
3	XSG2PT10411	I (BOP) I (SRO) TS (SRO)	2PT-1041-1 SG-A pressure detector fails low. **OP-2203.012D, Annunciator 2K04 Corrective Action** **OP-2105.001, CPC/CEAC Operations**
4	DI_C40_S72B ESFCIAS1 K04-C01 K07-C01	C(BOP) C(ATC) C(SRO) TS(SRO)	Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. **OP-2203.039, Inadvertent CIAS**
5	RCP2P32DUPP RCP2P32DMID	C (ATC) C (SRO)	Two seals on ‘D’ RCP fail **OP-2203.025, RCP Emergencies**
6	RCP2P32DLOW RCLOCATCD	M (ALL)	Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts. **OP-2202.001, SPTAs,** **OP-2202.003, Loss of Coolant Accident**
7	CVC2P36ASIAS CVC2P36CSIAS CVC2P36LOLVL	C (ATC) C (SRO)	Backup Charging pumps fail to start on low level or SIAS **OP-2202.010, Standard Attachments.**
8	SIS2P89ASS	C (BOP) C (SRO)	2P-89A High Pressure Safety Injection (HPSI) pump shaft shear. **OP-2202.010, Standard Attachments.**

End Point	RCS cooldown commenced IAW the LOCA EOP.

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

Target Quantitative Attributes (Section D.5.d)	Actual Attributes
Malfunctions after EOP entry (1-2)	2
Abnormal Events (2-4)	4
Major Transients (1-2)	1
EOPs entered requiring substantive actions (1-2)	1
EOP contingencies requiring substantive actions (0-1)	0
Critical Tasks (2-3)	3

Critical Task	Justification	
Component Cooling Water (CCW) to RCPs must be restored within 10 minutes of the loss of cooling water.	Exceeding operating limits has the potential to degrade the RCS pressure boundary. RCPs should be maintained in an available condition for last-resort use if needed. If RCPs are allowed to operate for 10 minutes without CCW flow. OP-1015.050 requires RCPs not meeting operating limits to be secured within 10 minutes.	• 1015.050 Time Critical Operation action program, Attachment C • CE EPGB Simulator CTs: CT-23, Trip any RCP exceeding operating limits (LOCA-04) • AOP OP-2203.039 Inadvertent CIAS.
Commence an RCS cooldown within 30 minutes of entry into OP-2202.003, LOCA EOP.	Cooling down and depressurizing the RCS removes decay heat and lowers the DP at the break, slowing the leak rate and reducing makeup volume required. SDC entry conditions are also required for long-term cooling.	• CE EPGB Simulator CTs: CT-20, Cool down and depressurize RCS (LOCA-09) • CR-ANO-2-2010-948, Critical task criteria
'D' RCP must be secured within 10 min of the reactor trip.	The out-of-limits condition could result in shaft seal damage, and then shaft seal failure could result in increased RCS leakage out the seal to the containment atmosphere, which would worsen the event severity.	• 1015.050 Time Critical Operation action program, Attachment C • CE EPGB Simulator CTs: CT-23, Trip any RCP exceeding operating limits. • CR-ANO-2-2010-948, Critical task criteria

Scenario #4 Objectives

1) Evaluate individual ability to shift Service Water returns.
2) Evaluate individual response to a failure a letdown flow control valve.
3) Evaluate individual response to a failure of Steam Generator pressure transmitter.
4) Evaluate individual response to a failure of a Containment Isolation Actuation Isolation signal.
5) Evaluate individual response to Reactor Coolant Pump seal failures.
6) Evaluate individual and crews ability to mitigate a Loss of Coolant Accident.
7) Evaluate individual ability to monitor operation of Engineered Safety Features equipment and respond to Back up Charging pumps fail to start on low level or SIAS.
8) Evaluate individual ability to monitor operation of Engineered Safety Features equipment and respond to a High Pressure Safety Injection pump Shaft Shear.

SCENARIO #4 NARRATIVE

Simulator session begins with the plant at ~4% power. [Site OE: CR-ANO-2-2016-1993 EH Leak causes power reduction and manual turbine trip. ICES # 323174]

When the crew has completed their control room walk down and brief, the BOP will shift Loop 1 Service Water return from the ECP to Lake Dardanelle using OP-2104.029 Service Water System Operations.

After the BOP has shifted the Loop 1 Service Water returns from the ECP to Lake Dardanelle, the letdown flow control valve 2CV-4816 will fail closed. The ATC will recognize that the flow control valve has failed closed and use the Annunciator Corrective action and Chemical Volume control procedure to shift letdown flow control valve and restore letdown. [Site OE: CR-ANO-2-2014-347, 2CV-4816 would not respond to an open command from the control room.]

When letdown has been placed back in service or when cued by lead examiner, the ‘A’ Steam Generator pressure safety channel pressure instrument, 2PT-1041-1, will fail low. This will trip one of the four PPS channels for low SG pressure trip. Alarms for RPS channel trip/pre-trip, MSIS pre-trip and channel ‘A’ operator insert (2C03) trip and pre-trip light will be lit. The SRO will refer to the ACA 2203.012D and enter tech specs 3.3.1.1, 3.3.2.1, 3.3.3.5, and 3.3.3.6. The BOP will place Channel ‘A’ PPS in bypass for point 11 SG pressure low, point 19 SG1 delta-P high, and point 20 SG2 delta-P. The crew will have one hour to place these points in bypass before exceeding the tech spec LCO. [Site OE: CR-ANO-2-1988-0025, CR-ANO-2-1994-398, Steam Generator pressure transmitter failed low.]

SCENARIO #4 NARRATIVE (continued)

When the appropriate Tech spec has been entered and 'A' PPS channel is placed in bypass and cued by lead examiner; An Inadvertent Containment Isolation will occur on the green train causing the green train CCW to RCPs valve and the Main Chilled water to containment valves to close. The SRO will enter Inadvertent CIAS AOP, OP 2203.039. The crew should restore Component Cooling Water (CCW) to RCPs. The SRO will enter Tech Spec 3.6.3.1 for the overridden Containment Isolation valve. The ATC will cycle charging pump to control pressurizer level. The crew should minimize CEA movement due to the loss of cooling. The BOP will start all containment coolers and align Service Water to maintain Containment temperature and pressure in the required band. The SRO should call for maintenance assistance to correct inadvertent green train Containment isolation. [Industry OE: SEN 268 Invalid Safety Injection with Failure to Reset, Site OE: CR-ANO-2-2013-005 Inadvertent SIAS, CCAS, And CIAS.]

When the actions of inadvertent CIAS have been completed or at the lead examiners cue 'D' RCP seals will fail. The SRO should enter the RCP emergencies AOP, 2203.025 due to the first failed seal. The SRO will contact operations management and continue plant operation based on their recommendation. When the second seal fails the Crew should trip the reactor and secure 'D' RCP. The crew may also secure 'A' or 'B' RCP to balance RCS flows. [Time critical operator action per OP-1015.050 Time Critical Operator action program secure RCP exceeding operating limits] [Industry OE: SER 36-80 Byron Jackson Reactor Coolant Pump Seal Failure, SOER 82-5, RCP Seal Failures]

The Crew will implement Standard Post Trip Actions (SPTA) EOP, 2202.001. During SPTAs, the third seal on 'D' RCP will fail and a Loss of Coolant Accident will commence. The crew may actuate SIAS and CCAS due to the RCS leak. The crew will restore service water to Component Cooling water (CCW). The CRS should direct Steam Generator pressure be lowered using Auto Local control of the Steam Dump Bypass Control System (SDBCS) to maintain MTS as RCS pressure lowers. [PRA item # 9 restore service water to CCW] [Site OE: CR-ANO-2-2013-2254, SDBCS Master controller would not control in automatic]

The SRO will diagnose either an Excess RCS leakage and enter Excess RCS leakage AOP, 2203.016, or if SIAS is actuated diagnose Loss of Coolant Accident (LOCA). If Excess RCS is diagnosed the SRO should implement the floating step for leakage greater than 44 gpm then actuate SIAS and CCAS and re-diagnose LOCA. The ATC should recognize the backup charging pump fail to start on low level and SIAS. The ATC will start the backup charging pumps. The crew should determine that 2P-89A HPSI pump has degraded discharge pressure, and start 2P-89C. The ATC will commence cool down of the RCS and control RCS pressure to restore pressurizer level. The BOP will override Service Water to Component Cooling Water and Auxiliary Cooling Water. [Industry OE: SEN-220, SEN-216, & SEN-182, RCS leakage events.]

Simulator Instructions for Scenario 4

Reset simulator to MOL ~4 % power.
Place MINIMAL RISK, Green Train Protected and RED Train Maintenance Week signs on 2C11.
Ensure the SDBCS master is in A/L with a setpoint of 1000 psi
Ensure both main feedwater pumps recirc valves are throttled to ~1gal/rpm

T5 =Reactor Trip

T6 = SIAS-2

Event No.	Malf. No.	Value/ Ramp Time	Event Description
1			Shift Loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle. **OP-2104.029, Service Water System Operations**
2	CV4816 Trigger = T1	0	Letdown flow control valve 2CV-4816 will fail closed. **OP-2203.012L, Annunciator 2K12 Corrective Action** **OP-2104.002, Chemical and Volume Control.**
3	XSG2PT10411 Trigger = T2	0	2PT-1041-1 SG-A pressure detector fails low. **OP-2203.012D, Annunciator 2K04 Corrective Action** **OP-2105.001, CPC/CEAC Operations**
4	DI_C40_S72B ESFCIAS1 K04-C01 K07-C01 Trigger = T3	active active ON ON	Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. **OP-2203.039, Inadvertent CIAS**
5	RCP2P32DUPP RCP2P32DMID Trigger = T4	100% 100%/ delay = 2 min.	Two seals on ‘D’ RCP fail **OP-2203.025, RCP Emergencies**
6	RCP2P32DLOW RCLOCATCD Trigger = T5	100%/ delay 2 min. 180 gpm/ delay 3 min.	Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts. **OP-2202.001, SPTAs,** **OP-2202.003, Loss of Coolant Accident**
7	CVC2P36ASIAS CVC2P36CSIAS CVC2P36LOLVL	active	Backup Charging pumps fail to start on low level or SIAS **OP-2202.010, Standard Attachments.**
8	SIS2P89ASS Trigger = T6	Active / delay = 30 secs.	2P-89A High Pressure Safety Injection (HPSI) pump shaft shear. **OP-2202.010, Standard Attachments.**

Simulator Operator CUEs		
		Shift Loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle. **OP-2104.029, Service Water System Operations**
Cue: If contacted as Chemistry to adjust chemical injection as necessary, then respond as requested.		
Cued by lead examiner	Trigger T1	Letdown flow control valve 2CV-4816 will fail closed. **OP-2203.012L, Annunciator 2K12 Corrective Action** **OP-2104.002, Chemical and Volume Control.**
Cue: When contacted as NLO, then report Rad monitor flow is zero gpm. **Cue: If contacted as a NLO, then report 2CVC-139 is open.** **Cue: When contacted as NLO, then report Rad monitor flow is 1 gpm.** **Cue: When contacted as the WWM, then report that I&C will start planning a work package to repair the control valve.**		
Cued by lead examiner	Trigger T2	2PT-1041-1 SG-A pressure detector fails low. **OP-2203.012D, Annunciator 2K04 Corrective Action** **OP-2105.001, CPC/CEAC Operations**
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed Steam Generator pressure instrument.		
Cued by lead examiner	Trigger T3	Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train.
Cue: If the contacted as the System Engineering or WMM center, then comply with the request to collect charging header nozzle data. **Examiner Cue: If the applicant tries to assess 2C-39 ESFAS panel then inform the applicant that all the lights on 2C-39 are on.** **Cue: If the contacted as the WWM, then report that I&C will start investigating the inadvertent CIAS** **Cue: If the contacted as the WWM to monitor CEDM coil temperatures, then report that I&C will monitor CEDM coil temperatures.** **Cue: If the contacted as the System Engineering for assistance, then state you will start investigating the issues.**		
Cued by lead examiner	Trigger T4	‘Two seals on ‘D’ RCP fail.

Cue: If the contacted as Operations Management the acknowledge the information about the failed seal.		
Reactor Trip	Trigger T5	Third 'D' RCP seal fails and a 180 gpm RCS leak starts.
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.** **Cue: When contacted as Chemistry, then report you will sample both S/G for activity.**		
SIAS	Trigger T6	2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.
Cue: If contacted as NLO to investigate 2P-89A HPSI pump, then after 2 min. report the coupling for 2P-89A HPSI pump has failed.		

Op-Test No.: 2017	Scenario #4	Event No.: 1
Event Description: Shift Loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	BOP	10.2.1 **NOTIFY** Chemistry to adjust chemical injection as necessary. 10.2.2 **ENSURE** Cooling Tower blowdown adjusted as desired using 2104.008, Circulating Water System Operation.
Cue: If contacted as Chemistry to adjust chemical injection as necessary, then respond as requested.		
	BOP	10.2.3 **ENSURE** at least ONE of the following open to establish a return path: • Cooling Tower Makeup 2CV-1540 (2HS-1540) • Squeeze valve 2CV-1460 using Cooling Tower Basin level controller (2LIC-1207A) (may be throttled)
	BOP	10.2.4 **<u>IF</u>** CCW/ACW in service, **<u>THEN</u> ENSURE** CCW/ACW Return Isol valves open: • Loop 1 CCW/ACW Return Isol 2CV-1543-1 (2HS-1543-1) • Loop 2 CCW/ACW Return Isol 2CV-1542-2 (2HS-1542-2)
	BOP	10.2.5 **CLOSE** selected SW Return to ECP: • Loop 1 Emerg Pond RTN 2CV-1541-1 (2HS-1541-1) • Loop 2 Emerg Pond RTN 2CV-1560-2 (2HS-1560-2)
	BOP	10.2.6 **<u>WHEN</u>** selected loop SW Return to ECP valve begins closing, **<u>THEN</u> ENSURE** associated SW Return to Lake valve begins opening: • SW Return Hdr #1 to Dardanelle (2CV-1481-1) • SW Return Hdr #2 to Dardanelle (2CV-1480-2)

Op-Test No.: 2017	Scenario #4	Event No.: 1

Event Description: Shift Loop 1 Service Water return from the Emergency Cooling Pond (ECP) to the Lake Dardanelle.

Time	Position	Applicant's Actions or Behavior
	BOP	10.2.7 **<u>IF</u>** Cooling Tower Basin level controller (2LIC-1207A) placed in MANUAL in step 10.1, **<u>THEN</u> PLACE** Cooling Tower Basin level controller in AUTO.
	BOP	*10.2.8 **MONITOR** Cooling Tower Basin level (2LIC-1207A). *10.2.9 **MONITOR** Main Chiller temperatures using OPS-B11, Inside AO Log. *10.2.10 **MONITOR** Loop 2 CCW temperature (2TIS-5209 or T5209).

Termination criteria: When Loop 1 Service Water returns is shifted or at lead examiner's discretion.

Op-Test No.: 2017	Scenario #4	Event No.: 2
Event Description: Letdown flow control valve 2CV-4816 will fail closed.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ATC	Announce annunciators: 2K12-J1 RADMONITOR FLOW LO
Enter 2203.012L, Annunciator 2K12 Corrective action.		
	ATC	2.1 IF due to intentional Operator action (i.e. plant cooldown Letdown isolated) OR expected system response (i.e. diverting), THEN no action required. **Examiner Note: Step 2.1 is N/A.**
	ATC	Direct a NLO to check flow. 2.2 Locally check flow on 2FIS-4807. **Examiner Note: Step 2.2 is N/A due to pump trip.**
Cue: When contacted as NLO, then report Rad monitor flow is zero gpm.		
	ATC	2.3 Verify letdown flow (2FIS-4801) greater than 28 gpm. Refer to Chemical and Volume Control (2104.002). **Examiner Note: ATC should recognize flow is less than 28 gpm and then determine it is because 2CV-4816 is closed.**
	ATC	2.4 Verify L/D to Rad monitor (2CV-4804) open.
	ATC	2.5 IF Letdown Flow controller (2HIC-4817) NOT controlling in AUTOMATIC, THEN perform the following: 2.5.1 Place Letdown Flow controller (2HIC-4817) in MANUAL. 2.5.2 Stabilize flow. **Examiner Note: Letdown flow controller is operating properly.**
	ATC	2.6 IF EITHER Letdown Flow Control valve (2CV-48l6 or 2CV-48l7) faulty, THEN place other valve in service using Chemical and Volume Control (2104.002).

Op-Test No.: 2017	Scenario #4	Event No.: 2
Event Description: Letdown flow control valve 2CV-4816 will fail closed.		

Time	Position	Applicant's Actions or Behavior
Enter 2104.002, Chemical and Volume Control.		
CAUTION **During operation with both Letdown Flow Control valves in service, Letdown flow and pressure oscillations may increase. (CR-ANO-2-2007-00013)**		
	ATC	9.7 Shifting Letdown Flow Control valves 9.7.1 Verify 2F-3A/B Inlet Isolation valve (2CVC-139) open. **Examiner Note: 2CVC-139 is normally maintained fully open.**
Cue: If contacted as a NLO, then report 2CVC-139 is open.		
	ATC	9.7.2 Place Letdown Flow controller (2HIC-4817) in MANUAL IAW applicable steps of this procedure section.
	ATC	9.4 Shifting Letdown Flow controller (2HIC-4817) from AUTOMATIC to MANUAL 9.4.1 At Letdown Flow controller (2HIC-4817) match MANUAL signal to AUTOMATIC signal. 9.4.2 At Letdown Flow controller (2HIC-4817) transfer controller from AUTOMATIC to MANUAL. *9.4.3 Adjust Letdown Flow controller (2HIC-4817) as needed until desired flow is achieved.
	ATC	9.7.3 Isolate Letdown using Letdown Flow controller (2HIC-4817).
	ATC	9.7.4 Place Letdown Flow controller (2HS-4817) to desired position: • 2CV-4816 • 2CV-4817 • BOTH
	ATC	9.7.5 Place Letdown Pressure controller (2PIC-4812) in Manual IAW applicable steps of this procedure section.

Op-Test No.: 2017	Scenario #4	Event No.: 2
Event Description: Letdown flow control valve 2CV-4816 will fail closed.		

Time	Position	Applicant's Actions or Behavior
	ATC	9.7.6 Using Letdown Pressure controller (2PIC-4812) verify selected Letdown Back Pressure Control valve(s) (2CV-4810/2CV-4811) fully open.
	ATC	9.7.7 Slowly raise Letdown flow using Letdown Flow controller (2HIC-4817).
	ATC	9.7.8 Using Letdown Pressure controller (2PIC-4812) slowly close 2CV-4810/2CV-4811 to establish desired backpressure: • IF RCS pressure < 450 psia, THEN maintain L/D backpressure (2PIC-4812) above saturation for letdown temperature (2TI-4820). • IF RCS pressure > 450 psia, THEN maintain L/D backpressure at setpoint (normal setpoint is 350 psig).
	ATC	9.7.9 WHEN letdown pressure at desired setpoint, THEN Letdown Pressure controller (2PIC-4812) may be placed in AUTO.
	ATC	9.7.10 Place Letdown Flow controller (2HIC-4817) in AUTO as desired IAW applicable steps of this procedure section.
	ATC	Direct a NLO to: 9.7.11 Establish 0.5 to 1.5 gpm flow through Rad Monitor Flow Indicator (2FIS-4807) IAW Letdown Line Radiation Monitor Flow Control section of this procedure.

Cue: When contacted as NLO, then report Rad monitor flow is 1 gpm.

NOTE

Attachment F should be performed when restoring Letdown after long shutdown or maintenance performed on flow control components. Test should also be performed if valve being placed in service has not been tested in the last 3 months; minimum setpoint has appeared to drift or is in question. (CR-2-2010-2459)

Op-Test No.: 2017	Scenario #4	Event No.: 2
Event Description: Letdown flow control valve 2CV-4816 will fail closed.		

Time	Position	Applicant's Actions or Behavior
	ATC	9.7.12 IF required, THEN perform Attachment F, Verification Of Minimum Letdown Flow.
Cue: When contacted as the WWM, then report that I&C will start planning a work package to repair the control valve.		
Termination criteria: The alternate flow control valve has been placed in service or at lead examiner's discretion.		

Op-Test No.: 2017	Scenario #4	Event No.: 3
Event Description: 2PT-1041-1 SG-A pressure detector fails low., Tech Spec for SRO		

Time	Position	Applicant's Actions or Behavior
Cued by Lead Examiner	ANY	Announce annunciators: • 2K04-A4 CH A RPS/ESF/PRETRIP/TRIP • 2K04-B3 PPS Channel TRIP • 2K04-E4 MSIS Pretrip.
	ANY	Report Low SG pressure pretrip/trip on PPS insert.
Enter 2203.012D, Annunciator 2K04 Corrective Action.		
	ATC	Compare all four channels and report 2PT-1041-1 failed low.
	SRO	**2K04-A4 CH A RPS/ESF/PRETRIP/TRIP applicable actions:** 2.1 Refer to PPS insert on 2C03 to determine cause. 2.2 Compare all Channels to validate alarm. 2.6 IF channel failed, THEN refer to Tech Specs 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6, and TRM 3.3.1.1. **2K04-B3 PPS Channel TRIP applicable actions:** 2.1 Determine which RPS or ESFAS trips have occurred on PPS inserts. 2.3 IF channel failed, THEN refer to Tech Specs 3.3.1.1 and 3.3.2.1 and TRM 3.3.1.1.

Op-Test No.: 2017	Scenario #4	Event No.: 3
Event Description: 2PT-1041-1 SG-A pressure detector fails low., Tech Spec for SRO		

Time	Position	Applicant's Actions or Behavior
		<u>2K04-E4 PPS Channel TRIP applicable actions:</u> 2.1 <u>IF</u> testing in progress AND channel bypassed, THEN no further action required. 2.2 <u>IF</u> pressure reduction is a planned evolution (i.e., plant C/D), <u>THEN</u> depress Low S/G Pressure Setpoint Reset pushbutton on Channel 1 PPS insert. 2.3 <u>IF</u> channel failed, <u>THEN</u> place in bypass using CPC/CEAC Operations (2105.001). 2.4 Refer to the following Tech Specs: • 3.3.2.1 • 3.3.3.5 • 3.3.3.6
	SRO	Direct BOP to bypass the associated functional units: • Steam Generator 1 Pressure - Low • Steam Generator 1 DP • Steam Generator 2 DP

Op-Test No.: 2017	Scenario #4	Event No.: 3
Event Description: 2PT-1041-1 SG-A pressure detector fails low., Tech Spec for SRO		

Time	Position	Applicant's Actions or Behavior
	BOP	Bypass the points 3, 4 and 5 on Channel B: 11.1 Refer to Tech Spec 3.3.1.1, 3.3.2.1, 3.3.3.5, 3.3.3.6 and TRM 3.3.1.1. 11.2 Circle channel and functional units (points) to be bypassed below: Channel to be bypassed: A B C D Points to be bypassed: 1 2 3 4 5 6 7 8 9 10 11 12 13 16 17 18 19 20 11.3 Enter appropriate Tech Spec/TRM actions. 11.4 Verify points to be bypassed <u>NOT</u> bypassed in ANY other channel. 11.5 Place desired points in BYPASS for selected channel on 2C23. **Examiner Note: SRO must enter LCO 3.3.1.1 action 2, 3.3.2.1 action 10, 3.3.3.5, and 3.3.3.6 action 1.**
	ANY	Annunciator 2K04-F3 PPS TEST/SECURITY will alarm while opening PPS door Annunciator 2K04-C3 PPS CHANNEL BYPASSED remains in alarm Verify correct channels in bypass.
	SRO	Contact work management.
Cue: When contacted as the WWM, then report that I & C planner will begin planning work on failed Steam Generator pressure instrument.		
Termination Criteria: Affected channel parameters placed in bypass or at lead examiner's discretion.		

Op-Test No.: 2017	Scenario #4	Event No.: 4
Event Description: Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce alarms for CIAS ACT 2K04-C1 and 2K07-C1 and CCW DISCH FLOW LO 2K-11 A1, A3, A5, A7
Examiner note: CCW DISCH FLOW LO alarm is an entry criteria to both RCP emergencies and Inadvertent CIAS. The SRO may enter RCP emergencies to restore CCW to the RCPs but after restoration of CCW to the RCPs, the SRO should complete the actions in Inadvertent CIAS		
Enter and Implement AOP 2203.039, Inadvertent CIAS.		
	SRO	*1. IF Reactor tripped, THEN verify 2202.001, Standard Post Trip Actions complete. **Examiner note: The Reactor will not be tripped.**
	SRO	2. Record start time. ___________
<u>**NOTE**</u> **A CIAS actuation will align RCP controlled bleedoff to the Quench tank, which could adversely affect seal performance.**		
	ANY	*3. Monitor RCP seals for proper performance.
	ANY	4. Check CNTMT pressure has NOT exceeded 18.3 psia.
	SRO	*5. IF CCW to RCPs can NOT be restored within 10 minutes, THEN perform the following: **Examiner note: The SRO will pass by this step to restore CCW to the RCPs.**
	ANY	6. Restore CCW to RCPs as follows: A. Check ALL Controlled Bleedoff temperatures less than 180°F.

Op-Test No.: 2017	Scenario #4	Event No.: 4
Event Description: Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
NOTE • **If an automatic containment isolation valve is overridden following an actuation, then TS 3.6.3.1 applies. If both valves in a single penetration are overridden, then TS 3.0.3 applies until administrative requirements can be completed for posting a dedicated operator.** • **Penetration 2P60 (CCW) is isolated by 2CV-5254-2 and 2CV-5255-1. Penetration 2P-52 (CCW) is isolated by 2CV-5236-1 and check valve 2CCW-38.**		
	BOP	B. Restore CCW to RCPs as follows: 1) Override and open RCP CCW Supply valve (2CV-5236-1). 2) Override and open RCP CCW Return valve (2CV-5254-2). 3) Override and open RCP CCW Return Header Isolation valve (2CV-5255-1).
Critical Task: Component Cooling Water (CCW) to RCPs must be restored within 10 minutes of the loss of cooling water.		
	SRO	C. <u>IF</u> ANY of the following valves are overridden, • RCP CCW Supply (2CV-5236-1) • RCP CCW Return (2CV-5255-1) • RCP CCW Return (2CV-5254-2) <u>THEN</u> refer to TS 3.6.3.1. **Examiner note: The SRO must enter 3.6.3.1 for Containment Isolation Valves due to the CCW to RCP valves being overridden which renders the ability to close inoperable.**

Op-Test No.: 2017	Scenario #4	Event No.: 4
Event Description: Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.		

Time	Position	Applicant's Actions or Behavior
	SRO	D. IF BOTH of the following valves are overridden, • RCP CCW Supply (2CV-5254-2) • RCP CCW Return (2CV-5255-1) THEN refer to TS 3.0.3. **Examiner note: TS 3.0.3 is not applicable.**
	ANY	*7. Check ALL RCP bearing and motor temperature annunciators clear: • "UPPER THRUST BRG METAL TEMP HI" (2K11-B1/B3/B5/B7). • "LOWER THRUST BRG METAL TEMP HI" (2K11-B2/B4/B6/B8). • "STATOR WDG TEMP HI" (2K11-A2/A4/A6/A8).
NOTE **The loss of Chilled Water to the CEDM coolers may raise the probability of a CEA dropping during movement.**		
	ANY	*8. Minimize CEA movement.
	ATC	*9. Maintain PZR Level within 5% of setpoint as follows: A. Cycle Charging pumps as needed. B. Record charging header data using 2202.010, Standard Attachment 44, Charging Header Data.
Cue: If the contacted as the System Engineering or WMM center, then comply with the request to collect charging header nozzle data.		
	ATC	*10. Maintain VCT level 60 to 75%, refer to 2104.003, Chemical Addition.

Op-Test No.: 2017	Scenario #4	Event No.: 4

Event Description: Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
NOTE **CNTMT temperature and pressure may rise due to loss of Main Chilled Water.**		
	ANY	*11. Check CNTMT temperature and pressure stable. **Examiner note: CNTMT temperature and pressure will be rising due to chilled water isolation.**
	BOP	***11. IF CNTMT temperature OR pressure rising, THEN perform the following:** **A. Verify CNTMT Coolers aligned as follows:** **1) ALL available CNTMT Cooling fans running:** • **2VSF-1A** • **2VSF-1B** • **2VSF-1C** • **2VSF-1D** **2) BOTH SW Cooling Inlet valves open:** • **2CV-1511-1** • **2CV-1510-2** **3) BOTH SW Cooling Outlet valves open:** • **2CV-1519-1** • **2CV-1513-2**
	ANY	**B. Refer to TS 3.6.1.4 Internal Pressure, Air Temperature and Relative Humidity.**
	SRO	12. Reset CIAS on PPS panels as follows: **Examiner note: CIAS inadvertently actuated thus can not be reset by the operators, they may attempt to reset CIAS but it will not reset.**

Examiner note: 2C-39 ESFAS panel is not fully modeled in the simulator. If the applicant tries to assess the status of the panel then give them the following cue.

Examiner Cue: If the applicant tries to assess 2C-39 ESFAS panel then inform the applicant that all the lights on 2C-39 are on.

Op-Test No.: 2017 Scenario #4 Event No.: 4

Event Description: Inadvertent Containment Isolation Actuation Signal (CIAS) on the Green Train. Tech Spec for SRO.

Time	Position	Applicant's Actions or Behavior
Cue: If the contacted as the WWM, then report that I&C will start investigating the inadvertent CIAS		
	SRO	12. IF CIAS actuation can NOT be reset, THEN GO TO Step 14.
	SRO	14. IF CIAS actuation can NOT be reset, THEN perform the following: A. Check Plant in Mode 1 or 2.
	ANY	B. Minimize CEA movement. C. Notify I&C to monitor CEDM coil temperatures. D. IF I&C NOT available, THEN refer to 2105.009 Exhibit #2, CEA #01 Upper Gripper Coil Temperature Measurement to determine CEDM coil temperatures. E. Contact System Engineer for assistance. F. IF coil temperatures are projected to be >450°F for an extended period AND restoration of CEDM Cooling is NOT imminent, THEN commence a Plant Shutdown. G. IF CEDM System Engineer NOT available, AND coil temperatures exceed 500°F, THEN perform the following: 1) Trip Reactor. 2) GO TO 2202.001, Standard Post Trip Actions. H. WHEN CIAS has been reset, THEN continue with this procedure.
Cue: If the contacted as the WWM to monitor CEDM coil temperatures, then report that I&C will monitor CEDM coil temperatures. **Cue: If the contacted as the System Engineering for assistance, then state you will start investigating the issues.**		
Termination Criteria: When Service water has been aligned to the CNTMT coolers or at the discretion of the lead examiner.		

Op-Test No.: 2017	Scenario #4	Event No.: 5
Event Description: Two seals on ‘D’ RCP fail		

Time	Position	Applicant's Actions or Behavior
Cued by lead examiner	ANY	Announce 2K-11 G-3 RCP bleedoff flow hi lo alarm.
	ANY	Determine that ‘D’ RCP is the affected RCP and one seal is failed.
Enter 2203.025, RCP Emergencies.		
	SRO	*1. **CHECK** the following criteria for EACH RCP satisfied: D. Seal Stage ∆P greater than 50 psid.
	SRO	**D. GO TO Step 6.**
	ANY	*6. **CHECK** ∆P across EACH RCP Seal stage greater than 50 psid.
	ANY	*6. **PERFORM** the following: A. **IF** ONLY ONE stage failed, **THEN** **PERFORM** the following: 1) **MONITOR** RCP Controlled Bleedoff flow and temperature. 2) **NOTIFY** Operations Management. **Examiner note: The other second RCP seals will fail after a 2 minute delay.**
Cue: If the contacted as Operations Management acknowledge the information about the failed seal.		

Op-Test No.: 2017		Scenario #4	Event No.: 5
Event Description: Two seals on 'D' RCP fail			
Time	**Position**	**Applicant's Actions or Behavior**	
	ANY	B. **IF** TWO stages failed on ONE pump, **THEN PERFORM** the following: 1) **IF** in Mode 1 OR 2, **THEN PERFORM** the following: a) Refer to applicable reactivity plan. **Examiner note: Reactor power is low enough a down power is not required.**	
	ATC	b) **COMMENCE** plant shutdown using EITHER of the following: • 2203.053, Rapid Power Reduction • 2102.004, Power Operations **Examiner note: Reactor power is low enough a down power is not required the ATC should trip the reactor.**	
	ATC	c) After reactor tripped, **STOP** ANY affected RCP.	
Critical Task: 'D' RCP must be secured within 10 min of the reactor trip.			
	ATC	d) **IF** only ONE RCP affected, **AND** desired to balance reactor coolant loop temperatures, **THEN ENSURE** ONE RCP secured in EACH loop. e) **IF** RCP 2P32A OR 2P32B stopped, **THEN ENSURE** associated PZR Spray valve in MANUAL and closed: • 2CV-4651 • 2CV-4652	
	ALL	f) **GO TO** 2202.001, Standard Post Trip Actions.	
Termination Criteria: Reactor tripped and 'D' RCP secured or at lead examiner's discretion.			

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
		Enter EOP 2202.001, Standard Post Trip Actions.
	SRO	1. Notify Control Board Operators to perform the following: A. Monitor safety functions using Exhibit 7, CBO Reactor Trip Checklist. B. Perform post trip contingencies as required 2. Open Safety Function Tracking page.
Reactivity control safety function	ATC	3. Check Reactivity Control established as follows: _____A. Reactor power lowering. B. Check startup rate is negative. _____C. ALL CEAs fully inserted by observing ANY of the following: 1) CEA Rod bottom lights illuminated. 2) CEAC 1 indicates ALL CEAs fully inserted. 3) CEAC 2 indicates ALL CEAs fully inserted.
Vital Auxiliaries safety function	BOP	4. Check Maintenance of Vital Auxiliaries satisfied: A. Check Main Turbine tripped by BOTH of the following: • ALL Main Stop Valves closed. • Generator megawatts indicate zero. B. Generator Output breakers open. **(Generator output breakers will be closed due to plant alignment, should perform contingency to open them)** **B. Open Generator Output breakers:** • **5130** • **5134**

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
Vital Auxiliaries safety function	BOP	C. Perform EITHER of the following as required: 1) Check the following valves closed: • MSR 2E-12A Steam Supply From SG A (2CV-0400) • MSR 2E-12B Steam Supply From SG B (2CV-0460) 2) No flow indicated on the following MSR second stage flow instruments: • 2FI-0402 • 2FI-0462 D. At least ONE 6900v AC bus energized. E. At least ONE 4160v Non-vital AC bus energized. F. BOTH 4160v Vital AC buses energized G. BOTH DGs secured. H. At least ONE 125v Vital DC bus energized: • 2D01 - SPDS point E2D01 • 2D02 - SPDS point E2D02
RCS Inventory Control Safety function	ATC	5. Check RCS Inventory Control established as follows: A. PZR level: ___ • 10 to 80%. ___ • Trending to setpoint. **(Will not be met due to LOCA Event #6, perform contingency)** ____B. RCS MTS 30°F or greater.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
RCS Inventory Control Safety function	SRO	Direct the following as necessary: **A. Perform as necessary:** **1) IF SIAS actuated on PPS inserts, THEN GO TO Step 6.** **2) Verify PZR Level Control system restoring level to setpoint. (Not Met)** **Examiner Note: Applicant may recognize the backup charging pumps failed to start automatically and start them. If not they will be started by verifying actuated equipment in the LOCA EOP.**
RCS Pressure Control Safety function	BOP	6. Check RCS Pressure Control: ___ • 1800 to 2250 psia. ___ • Trending to setpoint. **(May not be met due to LOCA Event #6, perform contingency)** • Normal PZR Spray and heaters controlling pressure. • Valid CNTMT Spray NOT in progress.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
RCS Pressure Control Safety function	SRO	Direct the following actions as necessary: **6. Perform as necessary:** **A. <u>IF</u> RCS pressure lowers to less than 1400 psia, <u>THEN</u> trip ONE RCP in EACH loop.** **D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed.** • **RCP A Spray Valve (2CV-4651)** • **RCP B Spray Valve (2CV-4652)** **E. <u>IF</u> ALL RCPs stopped <u>AND</u> RCS pressure control required, <u>THEN</u> initiate Aux spray using Attachment 48, RCS Pressure Control.** **F. <u>IF</u> RCS pressure lowers to 1650 psia or less, <u>THEN</u> perform the following:** **1) Verify SIAS actuated on PPS inserts.** **2) GO TO Step 7.** **G. Verify PZR Pressure Control system restoring pressure to setpoint.**
Core Heat Removal safety function.	ATC	7. Check Core Heat Removal by forced circulation: ____ A. At least ONE RCP running. B. CCW flow aligned to RCPs. ____ C. Loop delta T less than 10°F. ____ D. RCS MTS 30°F or greater. E. Check SW aligned to CCW. **(Not met)** F. IF SIAS or MSIS actuated, THEN maintain SW header pressure greater than 85 psig.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	SRO	**Direct the contingency for step 7. E** **E. IF CCW available, THEN restore SW to CCW, refer to 2202.010 Exhibit 5, CCW/ACW/SW Alignment.**
		Perform 2202.010, Exhibit 5 (CCW/ACW/SW Alignment)
	BOP	1. IF SW suction NOT aligned to lake, THEN **RETURN TO** procedure in effect.
	BOP	2. IF SW NOT aligned to CCW AND CCW available, THEN perform the following: A. IF RCP seal temperatures less than 180°F, THEN restore SW to CCW by performing the following: 1). Override and open at least ONE SW to CCW/ACW Return valve: • 2CV-1543-1 • 2CV-1542-2
		CAUTION Supplying ACW flow and CCW cooling from a single SW pump may result in low SW header pressure.
	BOP	2). Override and throttle open at least ONE SW to CCW /Main Chillers Supply valve: • 2CV-1530-1 • 2CV-1531-2 3). Maintain SW header pressure greater than 85 psig.
		EOP 2202.001, Standard Post Trip Actions.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
RCS Heat Removal Safety Function	BOP/ATC	8. Check RCS Heat Removal: A. Check SG available by BOTH of the following: • At least ONE SG level 10 to 90%. • FW maintaining SG level B. Check MFW in RTO **(MFW will not be in Reactor Trip Override (RTO) due to steam generator levels being at setpoint, and the contingencies are satisfied if steam generator levels are controlling near the setpoint)** C. Check Feedwater line intact by the following: • SG level stable or rising. • NO unexplained step changes or erratic FW flow. • NO unexplained step changes or erratic Condensate flow. D. Check RCS T_C 540°F to 555°F E. Check SG pressure 950 to 1050 psia. F. IF MSIVs open, AND desired, THEN place SDBCS Master Controller in Auto/Local with setpoint of 960 psia using 2105.008 Exhibit 3, SDBCS Emergency Operation. **Examiner Note: Due to the RCS mass loss the crew may lower the SDBCS setpoint to gain additional margin to saturation.**
Perform 2105.008, Exhibit 3 (SDBCS Emergency Operation)		
	BOP/ATC	1.0 IF BOTH MSIV's closed, THEN GO TO step 5.0. **Examiner Note: This step is NA.**

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
Exhibit 3	BOP/ATC	2.0 Perform the following to determine availability of SDBCS valves: 2.1 IF the following conditions satisfied, THEN SDBCS Master controller (2PIC-0300) available: • SDBCS controlling S/G pressure at setpoint in automatic • EMERGENCY OFF (2K02-A14) annunciator clear • Instrument air available • IF using Turbine Bypass valves, THEN CONDENSER INTERLOCK (2K02-B14) clear 2.2 IF the following conditions satisfied, THEN SDBCS Downstream ADV/Turbine Bypass valves available: • Instrument air available • EMERGENCY OFF (2K02-A14) annunciator clear • Power available to selected controllers/valves • IF using Turbine Bypass valves, THEN CONDENSER INTERLOCK (2K02-B14) clear

NOTE

- The SDBCS Master controller cannot be set less than 650 psi.
- Computer points FR1030 and FR1130 can be useful to monitor steam flow.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
Exhibit 3	BOP/ATC	3.0 IF SDBCS Master controller (2PIC-0300) available per step 2.0 AND use desired, THEN perform the following: 3.1 Place permissive handswitch for desired SDBCS Downstream ADV/Turbine Bypass valves in MANUAL: • 2CV-0301 Permissive (2HS-0301) • 2CV-0302 Permissive (2HS-0302) • 2CV-0303 Permissive (2HS-0303) • 2CV-0306 Permissive (2HS-0306) • 2CV-0305 Permissive (2HS-0305) 3.2 Verify SDBCS Master controller (2PIC-0300) in LOCAL using R/L button. 3.3 Adjust SDBCS Master controller (2PIC-0300) to desired setpoint
EOP 2202.001, Standard Post Trip Actions.		

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
Containment Safety Function	ANY	9. Check CNTMT parameters: A. Temperature and Pressure: • Temperature less than 140°F. • Pressure less than 16 psia. B. Check CNTMT Spray pumps secured. C. NO CNTMT radiation alarms or unexplained rise in activity: 1) CAMS alarms: • "CNTMT PART/GAS RAD HI/LO" annunciator (2K10-B6) clear. 2) RCS leakage alarms: • "AREA RADIATION HI/LO" annunciator (2K11-B10) clear. **(Not met due to LOCA Event #6)** • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. 3) Check the following radiation monitors trend stable: **(Not met due to LOCA Event #6)** • CNTMT Area • CAMS • Process Liquid D. NO secondary system radiation alarms or unexplained rise in activity: 1) "SEC SYS RADIATION HI" annunciator (2K11-A10) clear. 2) Secondary Systems Radiation monitors trend stable: • Main Steam lines • SG Sample • Condenser Off Gas

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	SRO	10. Notify STA to report to control room. 11. Direct NLOs to perform 2202.010 Attachment 47, Field Operator Post Trip Actions. 12. Verify Reactor trip announced on Plant page. 13. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
Cue: If contacted as the STA to report to the control room, acknowledge the request. **Cue: If contacted as a NLO to perform Attachment 47 Field Operator Post Trip Actions, acknowledge request.**		
	SRO	14. Direct control board operators to acknowledge ALL annunciators and announce ALL critical alarms.
	SRO	15. Check ALL safety function acceptance criteria satisfied. **(All safety functions are not satisfied, perform contingency)** 15. IF ANY safety function acceptance criteria NOT satisfied, THEN perform the following: A. Notify control room staff of safety functions NOT satisfied. B. GO TO Exhibit 8, Diagnostic Actions.
Diagnose Loss of Coolant Accident EOP 2202.003 or Excess RCS leakage AOP 2203.016 depending if SIAS is actuated.		
	SRO	If Excess RCS leakage is diagnosed, Enter and perform floating step # 9
	SRO	■ 9. IF RCS leakage greater than 44 gpm AND in Mode 3, 4, OR 5, THEN perform the following:
	ATC/BOP	B. Actuate SIAS. C. Actuate CCAS.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	SRO	D. GO TO 2202.010 Exhibit 8, Diagnostic Actions.
Examiner note: The SRO may discuss Tech Spec 3.4.6.2 for RCS leakage.		
Enter and implement Loss of Coolant Accident EOP 2202.003		
	SRO	* 1. Confirm diagnosis of LOCA as follows: A. Check SFSC acceptance criteria satisfied every 15 minutes. **(Normally performed by the STA)** B. IF CCW in service to provide SG Sample Cooler cooling, THEN perform the following: 1) Verify SG Sample valves open. • 2CV-5852-2 • 2CV-5859-2 • 2CV-5850 • 2CV-5858 2) Notify Chemistry to sample SGs for activity. C. IF SGs indicate primary to secondary leakage within TS limits, THEN continue with this procedure using SG with lowest leak rate for cooldown.
Cue: When contacted as Chemistry, then report you will sample both S/G for activity.		
	SRO	* 2. Notify SM to refer to Technical Specifications and 1903.010, Emergency Action Level Classification.
	SRO	3. Open Placekeeping Page.
	SRO	4. Record present time: Time ____________________
	ANY	5. Verify SIAS and CCAS actuated on PPS inserts.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	SRO	6. Notify Control Board Operators to perform the following: A. Monitor floating steps. B. Verify actuated ESFAS components using 2202.010, Exhibit 9, ESFAS Actuation.
2202.010, Exhibit 9, ESFAS Actuation		

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
Exhibit 9 ESFAS actuation.	BOP/ATC	*1.0 IF any abnormalities noted for affected ESFAS actuation, THEN notify CRS. 2.0 IF SIAS, THEN verify the following: ☐ Red Train RWT Outlet (2CV-5630-1) open. ☐ Red Train HPSI Pump in service with proper discharge pressure and flow. **(Will be running without proper discharge pressure and 2P-89C should be started)** ☐ Red Train HPSI Injection MOVs open. ☐ Red Train Service Water Pump in service with proper discharge pressure. ☐ Red Train LPSI Pump (2P60A) in service with proper discharge pressure and flow. ☐ Red Train LPSI Injection MOVs open. ☐ Green Train RWT Outlet (2CV-5631-2) open. ☐ Green Train HPSI Pump in service with proper discharge pressure and flow. ☐ Green Train HPSI Injection MOVs open. ☐ Green Train Service Water Pump in service with proper discharge pressure. ☐ Green Train LPSI Pump (2P60B) in service with proper discharge pressure and flow. ☐ Green Train LPSI Injection MOVs open. ☐ Available Charging Pumps in service with proper discharge pressure and flow. **(Backup Charging pumps will not be running and should be started)** ☐ Service Water Outlet Valves open for #1 and #2 EDGs. 3.0 IF CCAS, THEN verify the following: ☐ Red Train CNTMT Coolers in service. ☐ Service Water aligned to Red Train CNTMT Coolers. ☐ Red Train Bypass Dampers open. ☐ Green Train CNTMT Coolers in service. ☐ Service Water aligned to Green Train CNTMT Coolers. ☐ Green Train Bypass Dampers open.

Cue: If contacted as NLO to investigate 2P-89A HPSI pump, then after 2 min. report the coupling for 2P-89A HPSI pump has failed.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
Exhibit 9 ESFAS actuation	BOP	4.0 IF CSAS, THEN verify the following: ☐ Red Train CSS Pump (2P35A) in service with proper discharge pressure and flow. ☐ Red Train CSS Header Isolation (2CV-5612-1) open. ☐ Green Train CSS Pump (2P35B) in service with proper discharge pressure and flow. ☐ Green Train CSS Header Isolation (2CV-5613-2) open. ☐ Main Feedwater Block valves closed. ☐ MSIVs closed. ☐ Main Feed pumps tripped. ☐ Condensate pumps secured. ☐ Heater Drain pumps secured. 5.0 IF MSIS, THEN verify the following: ☐ MSIVs closed. ☐ Main Feedwater Block valves closed. ☐ Red Train Service Water Pump in service with proper discharge pressure. ☐ Green Train Service Water Pump in service with proper discharge pressure. ☐ Main Feed pumps tripped. ☐ Condensate pumps secured. ☐ Heater Drain pumps secured.
Loss of Coolant Accident EOP 2202.003		
	ANY	*7. Verify the following for any operating RCP: A. CSAS NOT actuated. B. Proper seal staging.
	ANY	■8. Check CCW aligned to RCPs.
	ANY	■9. Check RCS pressure greater than 1400 psia. **(May not be met, if not met perform contingency if required)**

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	ANY	■**9. Perform the following:** **A. IF RCS pressure less than 1400 psia, THEN perform the following:** **1) Verify maximum of ONE RCP running in EACH loop.** **2) <u>IF</u> RCP 2P32A or 2P32B stopped, <u>THEN</u> verify associated PZR Spray valve in MANUAL and closed.** **B. IF NPSH requirements violated OR RCS MTS less than 30°F, THEN perform the following:** **1) Stop ALL RCPs.** **2) Verify BOTH PZR Spray valves in MANUAL and closed.**
	ANY	■10. Restore ESF/Non-ESF systems post-SIAS using 2202.010 Attachment 51, Post ESFAS Actuation System Restoration.
2202.010 Standard Attachments, Attachment 51, Post ESFAS Actuation System Restoration.		
	BOP	1. Verify at least ONE SW pump running on EACH loop.

<u>CAUTION</u>

Operation of loaded DG without Service Water for greater than three minutes may cause engine damage.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	ANY	2. IF ANY EDG in operation, THEN perform the following: A. Check running EDG SW Outlet valve open: • 2DG-1 SW Outlet (2CV-1503-1) • 2DG-2 SW Outlet (2CV-1504-2) B. IF running EDG Service Water valve did NOT open automatically, THEN open valve with Control Room handswitch.
	ANY	C. IF SW Outlet valve can NOT be opened from Control Room, THEN locally perform the following for the affected DG: **Examiner Note: This step is NA**
NOTE **Manual operator for 2CV-1504-2 located in locked box near valve.**		
	ANY	3. Verify SW pump suction aligned to Lake.
	ANY	4. IF SW pump suction can NOT be aligned to Lake, THEN perform the following: **Examiner Note: This step is NA**
	ANY	5. IF NEITHER 2A1 OR 2A2 energized from offsite power, SGTR STEP 10 THEN perform the following: **Examiner Note: This step is NA**
	ANY	*6. IF BOTH 4160v Vital buses 2A3 AND 2A4 energized from offsite power, THEN start SW pumps as needed to maintain SW header pressure.
	ANY	7. IF NO 4160V busses energized, THEN return to procedure in effect. **Examiner Note: This step is NA**

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
	ANY	*8. IF only ONE 4160v Vital bus energized from offsite power AND additional SW pump start desired to maintain SW header pressure, THEN perform the following: **Examiner Note: This step is NA**
	ANY	9. IF EITHER 4160v Vital Bus supplied by EDG, THEN verify only one SW pump running on train supplied by EDG. **Examiner Note: This step is NA**
	ANY	*10. Maintain Service Water header pressure greater than 85 psig while performing the following using 2202.010 Exhibit 5, CCW/ACW/SW Alignment: A. IF Loop 2 CCW available, THEN restore Service Water to Component Cooling Water. **(Already restored)** B. Restore Service Water to Auxiliary Cooling Water.
Perform 2202.010, Exhibit 5 (CCW/ACW/SW Alignment)		
	ANY	1. IF SW suction NOT aligned to lake, THEN RETURN TO procedure in effect. **Examiner Note: This step is NA**
	ANY	2. IF SW NOT aligned to CCW AND CCW available, THEN perform the following: **Examiner Note: This step is NA**
	ANY	3. IF CCW flow NOT aligned to RCPs AND offsite power available, THEN perform the following: **Examiner Note: This step is NA**

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	ANY	4. IF SW NOT aligned to ACW, THEN perform the following: A. Verify at least ONE SW to CCW/ACW Return valve open: • 2CV-1543-1 • 2CV-1542-2 B. Override and throttle open ACW Supply valves: • 2CV-1425-1 • 2CV-1427-2 C. Maintain SW header pressure greater than 85 psig.
Loss of Coolant Accident EOP 2202.003		
		■11. <u>IF</u> Circ Water flow lost to the Main Condenser, <u>THEN</u> perform the following: **Examiner Note: This step is NA**
	ANY	*12. Verify Safety Injection flow to RCS as follows: A. Check total HPSI flow acceptable using 2202.010 Exhibit 2, HPSI Flow Curve. B. Check total LPSI flow acceptable using 2202.010 Exhibit 3, LPSI Flow Curve.
	ANY	■13. Check SG levels greater than 22.2%.
<u>NOTE</u> **A rise in SG level when feeding with Emergency Feedwater Pump 2P7B is confirmation of 2P7B feed capability.**		
	BOP	14. Align feedwater as follows: A. Verify EFW pump 2P7B capable of feeding intact SG using 2202.010 Attachment 46, Establishing EFW Flow.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
	BOP	B. IF running, THEN stop EFW pump 2P7A by overriding and closing (2CV-0340-2). C. Verify running MFW pump secured. D. Verify ALL MFW Block valves closed.
	ANY	15. Isolate LOCA as follows: A. Check for intact CCW system: • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. • CCW Surge Tanks level stable. B. Verify RCS Sample Isolation valves closed: • 2SV-5833-1 • 2SV-5843-2 C. Check for intact CCW system: • "PROC LIQUID RADIATION HI/LO" annunciator (2K11-C10) clear. • CCW Surge Tanks level stable.
	ANY	D. Verify non-actuated valve positions using 2202.010 Attachment 17, LOCA Isolation. **Examiner note: The SRO may elect to prioritize this attachment to be performed later in the event.**
	ANY	16. Check LOCA limited to CNTMT: • CNTMT Sump level rising. • CNTMT temperature, dewpoint, and pressure greater than pre-LOCA values. • Aux Building area radiation levels stable. • Aux Building Sump level less than 53%. • Waste Tanks 2T20A and 2T20B levels stable.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third 'D' RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
	ANY	■17. Check CNTMT isolation parameters: A. CNTMT pressure trend has NOT exceeded 18.3 psia. B. "CNTMT RADIATION HI" annunciator (2K10-A6) clear.
	ANY	■18. Check CNTMT pressure trend has NOT exceeded 23.3 psia.
NOTE **Continued CNTMT Spray operation may be desirable to reduce offsite doses from airborne activity in CNTMT.**		
	ANY	*19. IF CNTMT Spray operating, THEN terminate CNTMT Spray as follows: **Examiner note: CNTMT Spray should not be operating.**
	BOP	20. Verify ALL available miscellaneous CNTMT Building ventilation operating using 2202.010 Exhibit 13, Miscellaneous Containment Building Ventilation.
Perform 2202.010, Exhibit 13, Miscellaneous Containment Building Ventilation		

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8

Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.

Time	Position	Applicant's Actions or Behavior
	BOP	1.0 Verify ALL available CNTMT Building Recirculation Fans in operation: • 2VSF-31A • 2VSF-31B • 2VSF-31C • 2VSF-31D 2.0 Verify ALL available Reactor Cavity Cooling Fans in operation: • 2VSF-34A • 2VSF-34B 3.0 Verify a maximum of three CEDM Shroud Cooling Units in operation: • 2VSF-35A • 2VSF-35B • 2VSF-35C • 2VSF-35D
Loss of Coolant Accident EOP 2202.003		
	ANY	■21. Check ALL AC and Vital DC buses energized.
	ANY	■22. Check IA pressure greater than 65 psig.
	ANY	23. Check for isolated LOCA: • RCS pressure controlled. • RCS leakage less than available Charging pump capacity. **Examiner note: LOCA is not considered isolated.**
	SRO	**23. IF LOCA NOT isolated, THEN GO TO Section 3, Unisolated LOCA.**
	SRO	■1. Perform controlled cooldown to 275°F TC as follows: A. Check RCS TC greater than 275°F.

Op-Test No.: 2017	Scenario #4	Event No.: 6, 7, & 8
Event Description: Third ‘D’ RCP seal fails and a 180 gpm RCS leak starts, Backup Charging pumps fail to start on low level or SIAS, and 2P-89A High Pressure Safety Injection (HPSI) pump shaft shear.		

Time	Position	Applicant's Actions or Behavior
	ATC	B. Reset Low PZR Pressure and Low SG Pressure setpoints during cooldown and depressurization. C. Verify maximum of ONE RCP running in EACH loop. D. IF RCP 2P32A or 2P32B stopped, THEN verify associated PZR Spray valve in MANUAL and closed. E. Monitor cooldown rate as follows: • Record RCS TC and PZR temperature using 2202.010 Attachment 8, RCS Cooldown Table. • Plot RCS pressure versus RCS TC using 2202.010 Attachment 1, P-T Limits every 15 minutes. F. Initiate RCS cooldown using SDBCS bypass valves or ADVs.
Critical Task: Commence an RCS cooldown within 30 minutes of entry into OP-2202.003, LOCA EOP.		
	BOP	G. Control S/G levels with EITHER of the following: • EFW using 2202.010 Attachment 46, Establishing EFW Flow • AFW using 2202.010 Attachment 52, Establishing AFW Flow H. Secure running MFW pump. I. Close ALL MFW Block valves. J. Verify maximum of one condensate pump in service. K. Maintain condensate header pressure less than 700 psig using condensate pump recircs and MFW pump recircs.
Termination criteria: When the need for a cooldown has been determined or at the discretion of the lead examiner.		

10.2 Shifting Service Water Loop Return to Lake Dardanelle

10.2.1 **NOTIFY** Chemistry to adjust chemical injection as necessary.

10.2.2 **ENSURE** Cooling Tower blowdown adjusted as desired using 2104.008, Circulating Water System Operation.

10.2.3 **ENSURE** at least ONE of the following open to establish a return path:

- Cooling Tower Makeup 2CV-1540 (2HS-1540)
- Squeeze valve 2CV-1460 using Cooling Tower Basin level controller (2LIC-1207A) (may be throttled)

10.2.4 **IF** CCW/ACW in service,
THEN ENSURE CCW/ACW Return Isol valves open:

- Loop 1 CCW/ACW Return Isol 2CV-1543-1 (2HS-1543-1)
- Loop 2 CCW/ACW Return Isol 2CV-1542-2 (2HS-1542-2)

10.2.5 **CLOSE** selected SW Return to ECP:

- Loop 1 Emerg Pond RTN 2CV-1541-1 (2HS-1541-1)
- Loop 2 Emerg Pond RTN 2CV-1560-2 (2HS-1560-2)

10.2.6 **WHEN** selected loop SW Return to ECP valve begins closing,
THEN ENSURE associated SW Return to Lake valve begins opening:

- SW Return Hdr #1 to Dardanelle (2CV-1481-1)
- SW Return Hdr #2 to Dardanelle (2CV-1480-2)

10.2.7 **IF** Cooling Tower Basin level controller (2LIC-1207A) placed in MANUAL in step 10.1,
THEN PLACE Cooling Tower Basin level controller in AUTO.

* 10.2.8 **MONITOR** Cooling Tower Basin level (2LIC-1207A).

* 10.2.9 **MONITOR** Main Chiller temperatures using OPS-B11, Inside AO Log.

* 10.2.10 **MONITOR** Loop 2 CCW temperature (2TIS-5209 or T5209).