Facility: Indian Point Unit 2 Date of Examination: July 12, 2010

Examination Level: RO ☐ **SRO X** Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	**Review WCR-1** 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc.
Conduct of Operations	N, R	**Determine Location for Spent Fuel Assembly** 2.1.42 Knowledge of new and spent fuel movement procedures.
Equipment Control	N, R	**Initiate a Temporary Procedure Change** 2.2.6 Knowledge of the process for making changes to procedures.
Radiation Control	M, R, P	**Review/Approve a Liquid Radiation Release Permit** 2.3.11 Ability to control radiation releases.
Emergency Procedures/Plan	D	**Classify Security Event** 2.4.28 Knowledge of procedures relating to a security event (non-safeguards information).

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

INDIAN POINT UNIT 2 NRC ~~RO~~ SRO EXAMINATION

CONDUCT OF OPERATIONS: Review WCR-1 The candidate will be given a copy of WCR-1, Reactivity Summary Sheet prepared by an RO for review. The candidate will review the calculation and find an error. The candidate should NOT sign Reviewed By and return the form.

- This is a New JPM
- SRO Only

CONDUCT OF OPERATIONS: Determine Location for Spent Fuel Assembly This JPM gives the candidate a spent fuel assembly with initial enrichment and burnup. The spent fuel assembly must be moved in the pit. The candidate must determine the spent fuel pit location zone.

- This is a New JPM
- The SRO Only

EQUIPMENT CONTROL: Initiate a Temporary Procedure Change. This JPM will initiate a Temporary Procedure Change for 2-AOP-ROD-1. The procedure is missing a step to place the P-A converter in Manual before depressing the UP-Down buttons. (Note this step does exist in other locations in the procedure)

- This is a New JPM
- SRO Only.

RADIATION CONTROL: Review a Liquid Radiation Release Permit. This JPM has modified values from the existing bank version. The permit will have inaccurate information.

- This is a Modified Bank JPM
- SRO Only.

EMERGENCY PROCEDURES/PLAN: Respond to a Security Event. The candidate will be notified that a security event is in progress. The candidate must respond in accordance with 0-AOP-SEC-1 and classify the event. Once the event is classified, the candidate will have 15 minutes to complete the NY State Part 1 form.

- This is a Modified Bank JPM.
- SRO Only.

SRO
ADMIN

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to Review a Manual Reactivity Summary Calculation.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

An Instant SRO Candidate has prepared a Manual Reactivity Summary Calculation in accordance with 2-WCR-1 for training evaluation qualification.

You are directed to Review the Manual Reactivity Summary Calculation.

Current Plant Conditions:

- Reactor Power – 100%
- Control bank D rods are at 223
- Boron Concentration – 970
- EFPD – 327
- MTC (NuPOP) – 14.3 pcm/°F
- ITC – 16.5 pcm/°F
- Estimated Shift Reactivity due to core burnup – 71 gallons primary water

TASK STANDARD:

Manual Reactivity Summary Calculation Reviewed.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain current revision of 2-WCR-1	Obtains Current Copy of Procedure	
3.	Check Given Data on the form	Check Data on Form Entered correctly	
4.	Check Graph RCS-4 HSD Boron Conc.	Checks 1255 Entered Correctly	
5.	Check A. Power Coefficient Value	Value Correct at 16.09 pcm/%	
6.	Check B Boron Worth	Value Correct at 7.86 pcm/ppm	
7.	Check C. Boration	Value Correct at 3.19 gal/ppm	
8.	Check D. Dilution	Value Correct at 66.9 gal/ppm	
9.	Check E. Rod Worth	Value Correct at 2.7 pcm/step	
10.	Check G. MWD/MTU	Value Correct at 12000 MWD/MTU	
11.	Check Boron for 1°F change	Value correct at 6 gal	
12.	Check Dilution for 1°F change	Value correct at 122 gal	
13.	Check Rod Step for 1°F change	Value Correct at 5 steps	
14.	Check Megawatts for 1°F change	Value Correct at 10	
16.	Check Desired Rod Position 10%	Value Correct at 203 steps	
●17.	Check Boron Addition to compensate for 10%	Determines Value Incorrect. Correct value should be 54	
.	Note candidate may stop at this point because calculation is Unsatisfactory		
18.	Check Desired Rod Position 30%	Value Correct at 182	
19.	Check Boron Addition to compensate for 30%	Value Correct at 89	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
20.	Check Desired Rod Position 50%	Value Correct at 172	
21.	Check Boron Addition to compensate for 50%	Value Correct at 188	
●22.	Inform Preparer that Calculation is incorrect and that he has failed the JPM		
	JPM Complete		

KEY

DATE: TODAY
(Page 1 of 3)

Reactivity Summary

1. Reactor Operator performs calculations during midnight shift Saturday night for Sunday.
2. The STA (Preferred) or CRS will independently verify the calculations (or inputs if computer generated)
3. On-coming Reactor Operators will present items 5 – 12 during the formal crew turnover meetings.
4. Linear interpolation between burnup values is permitted on RV-11.
5. Reactor power 100 %
6. RCS Boron Concentration 970 PPM
7. HSD Boron Concentration (RCS-4) 1255 PPM
8. Boron for 1°F change (C * H/B) 6 Gal
9. Dilution for 1°F change (D * H/B) 122 Gal
10. Rod Steps for 1°F change (H/E) 5 Steps
11. Megawatts for 1°F change 10 * I/A 10 MW
12. Estimated Shift Reactivity additions due to core burn up 71 Gal PW/Boron
    Compute average PPM change per shift using change over several days and convert to required PW/Boron or Total Dilutions/Borations in X shifts divided by X.

RAPID POWER REDUCTION (NO XENON change)	DESIRED ROD POSITION STEPS (RV-11)	BORON ADDITION TO COMPENSATE PWR Defect less Rods
10%	203	54
30%	182	89
50%	172	188

Performed by / Date _____ Reviewed by _____

Reactivity Values		
A. Power coefficient (RV-2) (10% Range from current power)	16.09	pcm/%
B. Boron worth (RV-3)	7.86	pcm/ppm
C. Boration (Dilution/Boration Tables)	3.19	gal/ppm
D. Dilution (Dilution/Boration Tables)	66.9	gal/ppm
E. Rod Worth (RV-1) (10 Step Range)	2.7	pcm/step
F. EFPDs (obtained from previous 2-WCR-1 OR Reactor Engineering)	327.15	EFPD
G. MWD/MTU (F X 36.68)	12000	MWD/MTU
H. Moderator Temperature Coefficient (Online NuPOP)	14.3	pcm/°F
I. Isothermal Temperature Coefficient (Online NuPOP)	16.5	pcm/°F

2-WCR-1
Rev 8

PAGE 9 Indian Point Unit 2 Boration - Dilution Tables

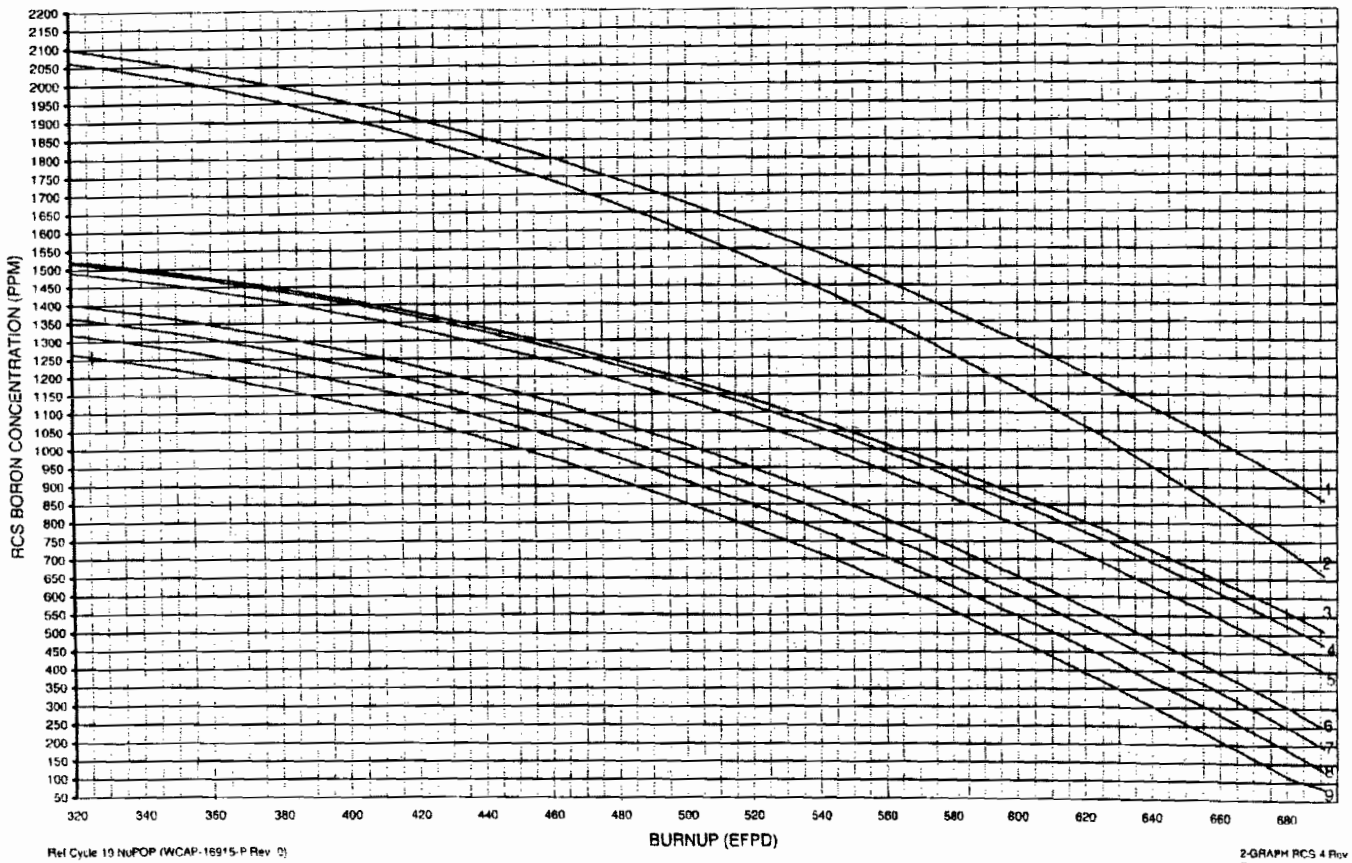
PPM BORON CONC.	REQD GAL OF ACID TO BORATE 1 PPM	REQD GAL OF WATER TO DILUTE 1 PPM	REQD GAL OF ACID TO BORATE 2 PPM	REQD GAL OF WATER TO DILUTE 2 PPM	REQD GAL OF ACID TO BORATE 5 PPM	REQD GAL OF WATER TO DILUTE 5 PPM	REQD GAL OF ACID TO BORATE 10 PPM	REQD GAL OF WATER TO DILUTE 10 PPM	REQD GAL OF ACID TO BORATE 20 PPM	REQD GAL OF WATER TO DILUTE 20 PPM	REQD GAL OF ACID TO BORATE 50 PPM	REQD GAL OF WATER TO DILUTE 50 PPM
810	3.17	80.10	6.33	160.20	15.83	401.30	31.66	805.20	63.33	1620.50	158.44	4129.90
820	3.17	79.10	6.33	158.30	15.83	396.40	31.67	795.30	63.36	1600.50	158.52	4077.90
830	3.17	78.10	6.34	156.40	15.84	391.60	31.69	785.70	63.39	1581.00	158.60	4027.20
840	3.17	77.20	6.34	154.50	15.85	387.00	31.70	776.30	63.42	1561.90	158.68	3977.70
850	3.17	76.30	6.34	152.70	15.86	382.40	31.72	767.10	63.46	1543.30	158.76	3929.50
860	3.17	75.40	6.35	150.90	15.87	377.90	31.74	758.10	63.49	1525.20	158.84	3882.40
870	3.17	74.50	6.35	149.20	15.87	373.60	31.75	749.30	63.52	1507.40	158.92	3836.40
880	3.18	73.70	6.35	147.50	15.88	369.30	31.77	740.80	63.55	1490.10	159.00	3791.50
890	3.18	72.90	6.36	145.80	15.89	365.20	31.78	732.40	63.58	1473.20	159.08	3747.70
900	3.18	72.10	6.36	144.20	15.90	361.10	31.80	724.20	63.61	1456.60	159.15	3704.80
910	3.18	71.30	6.36	142.60	15.91	357.10	31.82	716.20	63.65	1440.40	159.23	3662.90
920	3.18	70.50	6.36	141.10	15.91	353.20	31.83	708.40	63.68	1424.60	159.31	3622.00
930	3.18	69.70	6.37	139.50	15.92	349.40	31.85	700.70	63.71	1409.10	159.39	3582.00
940	3.19	69.00	6.37	138.10	15.93	345.70	31.86	693.20	63.74	1394.00	159.47	3542.80
950	3.19	68.30	6.37	136.60	15.94	342.00	31.88	685.90	63.77	1379.10	159.55	3504.50
960	3.19	67.60	6.38	135.20	15.95	338.50	31.89	678.70	63.80	1364.60	159.63	3467.00
970	3.19	66.90	6.38	133.80	15.95	335.00	31.91	671.70	63.84	1350.40	159.71	3430.30
980	3.19	66.20	6.38	132.40	15.96	331.50	31.93	664.80	63.87	1336.50	159.79	3394.30
990	3.19	65.50	6.39	131.10	15.97	328.20	31.94	658.00	63.90	1322.80	159.87	3359.10
1000	3.20	64.80	6.39	129.80	15.98	324.90	31.96	651.40	63.93	1309.50	159.95	3324.70
1020	3.20	63.60	6.40	127.20	15.99	318.50	31.99	638.60	64.00	1283.50	160.11	3257.80
1040	3.20	62.40	6.40	124.80	16.01	312.40	32.02	626.30	64.06	1258.60	160.27	3193.60
1060	3.20	61.20	6.41	122.40	16.03	306.50	32.05	614.40	64.13	1234.60	160.43	3131.90
1080	3.21	60.00	6.42	120.10	16.04	300.80	32.09	603.00	64.19	1211.60	160.59	3072.50
1100	3.21	59.00	6.42	118.00	16.06	295.30	32.12	591.90	64.25	1189.30	160.76	3015.30
1120	3.21	57.90	6.43	115.80	16.07	290.00	32.15	581.30	64.32	1167.90	160.92	2960.20
1140	3.22	56.90	6.44	113.80	16.09	284.90	32.18	571.10	64.38	1147.20	161.08	2907.10
1160	3.22	55.90	6.44	111.80	16.11	280.00	32.22	561.20	64.45	1127.30	161.24	2855.80
1180	3.22	55.00	6.45	110.00	16.12	275.20	32.25	551.60	64.51	1108.00	161.41	2806.40
1200	3.23	54.00	6.45	108.10	16.14	270.60	32.28	542.40	64.58	1089.40	161.57	2758.60

SYSTEM TEMPERATURE = 547 DEGF

KEY

CONTROLLED

INDIAN POINT STATION UNIT NO.2 CYCLE 19
MINIMUM SHUTDOWN BORON CONCENTRATION



GRAPH BASED ON THE FOLLOWING

- ONE STUCK HOT (52 RODS INSERTED)
- NO CREDIT TAKEN FOR XENON
- CREDIT TAKEN FOR 80% OF THE FULL POWER EQUILIBRIUM SAMARIUM WORTH AS A FUNCTION OF BURNUP
- A 100 PPM SAFETY FACTOR IS INCLUDED
- MINIMUM BORON VALUES FOR 300 DEG F AND BELOW INCLUDE ADDITIONAL BORON TO ACCOUNT FOR AN INADVERTENT RCS BORON DILUTION WHILE ON SDC SYSTEM
- INCLUDES EFFECT OF MAX THEORETICAL HYDIDE DEPLETION AS A FUNCTION OF BURNUP
- GRAPH INCLUDES SHUTDOWN MARGIN REQUIRED BY GRAPH RPC 6
- REQUIRED BORON CONCENTRATION IS ON OR ABOVE THE CURVE FOR THE EXISTING BURNUP AND STUCK RANGE
- GRAPH IS VALID FOR AN EOL CORE BURNUP OF 691 EFPDS AND BEYOND

KEY

1 88F - 299 F
2 300F - 399F
3 300F - 339F (RHR NOT IN SERVICE)
4 340F - 399F (RHR NOT IN SERVICE)
5 400F - 479F
6 480F - 499F
7 500F - 519F
8 520F - 539F
9 540F - UP

RE APPROVED: C. Zipp
EFFECTIVE DATE: 4/19/03

Ref Cycle 19 NuPOP (WCAP-16915-P Rev 0)

O:\SITE RXE\Cy 19 Graphs U2\BOL\graphRCS_4cy19.xls

2-GRAPH RCS 4 Rev 68
Page 2 of 2

KEY

Indian Point Unit 2 Cycle 19

TOTAL POWER DEFECT (pcm) AS A FUNCTION OF POWER AND BORON CONCENTRATION AT MOL/EOL (20000 MWD/MTU)

Boron Conc. (ppm)	POWER LEVEL (%) 0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
0	0.0	153.5	297.6	433.4	562.3	685.2	803.3	917.4	1028.5	1137.1	1244.1	1349.9	1455.0	1559.8	1664.5	1769.4	1874.5	1979.8	2085.2	2190.6	2295.6
50	0.0	152.3	295.1	429.9	557.7	679.7	796.9	910.0	1020.1	1127.8	1233.6	1338.3	1442.2	1545.8	1649.2	1752.7	1856.3	1960.2	2064.1	2168.0	2271.5
100	0.0	151.0	292.7	426.5	553.3	674.4	790.6	902.8	1011.9	1118.6	1223.4	1327.0	1429.7	1532.0	1634.1	1736.3	1838.6	1941.0	2043.5	2145.9	2248.0
150	0.0	149.8	290.4	423.1	549.0	669.2	784.5	895.8	1003.9	1109.6	1213.4	1315.9	1417.5	1518.6	1619.5	1720.3	1821.2	1922.2	2023.3	2124.3	2224.9
200	0.0	148.6	288.2	419.9	544.9	664.1	778.5	888.9	996.1	1100.9	1203.7	1305.1	1405.6	1505.5	1605.1	1704.6	1804.2	1903.9	2003.5	2103.1	2202.4
250	0.0	147.4	286.0	416.7	540.8	659.1	772.6	882.2	988.5	1092.3	1194.1	1294.5	1393.9	1492.7	1591.1	1689.4	1787.6	1885.9	1984.2	2082.4	2180.3
300	0.0	146.3	283.8	413.6	536.8	654.3	766.9	875.6	981.0	1083.9	1184.8	1284.1	1382.5	1480.1	1577.4	1674.4	1771.4	1868.4	1965.3	2062.1	2158.7
350	0.0	145.2	281.7	410.6	532.9	649.5	761.3	869.2	973.8	1075.7	1175.6	1274.0	1371.3	1467.9	1564.0	1659.8	1755.5	1851.2	1946.8	2042.3	2137.5
400	0.0	144.2	279.7	407.7	529.1	644.9	755.9	862.9	966.6	1067.7	1166.7	1264.1	1360.4	1455.9	1550.8	1645.5	1740.0	1834.4	1928.8	2022.9	2116.8
450	0.0	143.1	277.7	404.8	525.4	640.4	750.6	856.8	959.7	1059.9	1158.0	1254.4	1349.7	1444.1	1538.0	1631.5	1724.8	1818.0	1911.1	2003.9	2096.5
500	0.0	142.1	275.8	402.0	521.8	636.0	745.4	850.8	952.8	1052.2	1149.4	1245.0	1339.3	1432.7	1525.4	1617.8	1710.0	1801.9	1893.7	1985.4	2076.6
550	0.0	141.2	273.9	399.3	518.3	631.7	740.3	844.9	946.2	1044.7	1141.0	1235.7	1329.0	1421.4	1513.2	1604.4	1695.4	1786.2	1876.8	1967.1	2057.2
600	0.0	140.2	272.1	396.7	514.8	627.5	735.3	839.2	939.6	1037.4	1132.9	1226.6	1319.0	1410.4	1501.1	1591.3	1681.2	1770.8	1860.2	1949.3	2038.1
650	0.0	139.3	270.3	394.1	511.5	623.3	730.5	833.5	933.3	1030.2	1124.9	1217.7	1309.2	1399.7	1489.3	1578.5	1667.2	1755.7	1843.9	1931.8	2019.4
700	0.0	138.4	268.5	391.5	508.2	619.3	725.7	828.1	927.0	1023.2	1117.0	1209.0	1299.6	1389.1	1477.8	1565.9	1653.6	1740.9	1828.0	1914.7	2001.0
750	0.0	137.5	266.8	389.0	504.9	615.4	721.0	822.7	920.9	1016.3	1109.3	1200.5	1290.2	1378.8	1466.5	1553.6	1640.2	1726.4	1812.3	1897.9	1983.0
800	0.0	136.6	265.2	386.6	501.8	611.5	716.5	817.4	914.9	1009.5	1101.8	1192.2	1281.0	1368.7	1455.4	1541.5	1627.1	1712.2	1797.0	1881.4	1965.4
850	0.0	135.7	263.5	384.2	498.7	607.7	712.0	812.3	909.0	1002.9	1094.4	1184.0	1272.0	1358.7	1444.6	1529.6	1614.2	1698.3	1782.0	1865.2	1948.1
900	0.0	134.9	261.9	381.9	495.7	604.0	707.6	807.2	903.3	996.5	1087.2	1176.0	1263.1	1349.0	1433.9	1518.0	1601.5	1684.6	1767.2	1849.4	1931.1
950	0.0	134.1	260.3	379.6	492.7	600.4	703.4	802.2	897.6	990.1	1080.1	1168.1	1254.4	1339.5	1423.4	1506.6	1589.1	1671.1	1752.7	1833.8	1914.4
1000	0.0	133.3	258.8	377.3	489.8	596.8	699.1	797.4	892.1	983.9	1073.2	1160.4	1245.9	1330.1	1413.2	1495.4	1577.0	1657.9	1738.4	1818.5	1898.0
970											1077.3				1419.5				1746.9		1907.9

RE - Approved

10-27-09

Effective Date

Ref. Cycle 19 NuPOP (MOL, EOL - 20000 MWD/MTU)
Rev. 47

2-GRAPH-RV-2

Time: 15 minutes
Administrative

2-WCR-1

File: 2000820122-1.doc
Task Number: 2000820122

KEY

INDIAN POINT ENERGY CENTER
UNIT NO. 2 - CYCLE 19

Bank Overlap Remaining Rod Worth

D - Bank Steps	Worth PCM
223	0.0
213	27.4
203	89.4
193	180.8
182	271.1
183	281.1
172	365.9
173	375.4
163	459.4
153	532.9
143	596.8
133	652.1
123	699.6
113	739.9
100	784.3
93	810.9
83	870.0
73	952.2
63	1044.1
53	1136.1
43	1225.0
33	1309.1
23	1386.0
13	1452.4
3	1505.9
0	1519.6
C - Bank Steps	
113	1554.7
100	1592.4

$\frac{27.4}{10} = 2.7$

RE APPROVED

10-27-09
EFFECTIVE DATE

KEY

Ref. Cycle 19 NuPOP HZP (MOL/EOL - 20000 MWD/MTU)
Rev. 57

2 - Graph - RV-1

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIATING CUES:

An RO

~~An Instant SRO Candidate~~ has prepared a Manual Reactivity Summary Calculation in accordance with 2-WCR-1 for training evaluation qualification.

You are directed to Review the Manual Reactivity Summary Calculation.

Current Plant Conditions:

- Reactor Power – 100%
- Boron Concentration – 970
- EFPD – 327
- MTC (NuPOP) – 14.3 pcm/°F
- ITC – 16.5 pcm/°F
- Estimated Shift Reactivity due to core burnup – 71 gallons primary water

TASK STANDARD:

Manual Reactivity Summary Calculation Reviewed.

Critical Cue

DATE: TODAY
(Page 1 of 3)

Reactivity Summary

1. Reactor Operator performs calculations during midnight shift Saturday night for Sunday.
2. The STA (Preferred) or CRS will independently verify the calculations (or inputs if computer generated)
3. On-coming Reactor Operators will present items 5 – 12 during the formal crew turnover meetings.
4. Linear interpolation between burnup values is permitted on RV-11.
5. Reactor power ___100___ %
6. RCS Boron Concentration ___970___ PPM
7. HSD Boron Concentration (RCS-4) ___1255___ PPM
8. Boron for 1°F change (C * H/B) ___6___ Gal
9. Dilution for 1°F change (D * H/B) ___122___ Gal
10. Rod Steps for 1°F change (H/E) ___5___ Steps
11. Megawatts for 1°F change 10 * I/A ___10___ MW
12. Estimated Shift Reactivity additions due to core burn up ___71___ Gal PW/Boron
    Compute average PPM change per shift using change over several days and convert to required PW/Boron or Total Dilutions/Borations in X shifts divided by X.

RAPID POWER REDUCTION (NO XENON change)	DESIRED ROD POSITION STEPS (RV-11)	BORON ADDITION TO COMPENSATE PWR Defect less Rods
10%	203	29
30%	182	89
50%	172	188

RO TODAY
Performed by / Date

Reviewed by

Reactivity Values		
A. Power coefficient (RV-2) (10% Range from current power)	16.09	**pcm/%**
B. Boron worth (RV-3)	7.86	**pcm/ppm**
C. Boration (Dilution/Boration Tables)	3.9	**gal/ppm**
D. Dilution (Dilution/Boration Tables)	66.9	**gal/ppm**
E. Rod Worth (RV-1) (10 Step Range)	2.7	**pcm/step**
F. EFPDs (obtained from previous 2-WCR-1 OR Reactor Engineering)	327.15	**EFPD**
G. MWD/MTU (F X 36.68)	12000	**MWD/MTU**
H. Moderator Temperature Coefficient (Online NuPOP)	14.3	**pcm/°F**
I. Isothermal Temperature Coefficient (Online NuPOP)	16.5	**pcm/°F**

File:
Task Number:

SRO
ADMIN

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to determine Spent Fuel Pit Region(s) each fuel assembly can be moved to.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

Three fuel assemblies in the spent fuel pit need to be moved to facilitate an inspection of the spent fuel racks in those areas.

Fuel Assembly Data

Fuel Assembly 1
- Initial Enrichment 4.5 W/o
- Burnup 52,000 MWD/MTU
- In Spent Fuel Pit since April 2005
- Number of IFBA Rods 0

Fuel Assembly 2
- Initial Enrichment 4.6 W/o
- Burnup 32000 MWD/MTU
- In Spent Fuel Pit since March 2010
- Number of IFBA Rods 0

Fuel Assembly 3
- Initial Enrichment 4.95 W/o
- Burnup 0 MWD/MTU (New Fuel Assembly)
- Ins Spent Fuel Pit since January 2010
- Number of IFBA Rods 24

Your are directed to determine the Spent Fuel Pit Region(s) each fuel assembly can be moved to.

TASK STANDARD:

Acceptable Storage Regions identified for each fuel assembly.

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Tech Spec Section 3.7.13 and Basis	Obtains TS	
✹3.	Candidate evaluates Fuel Assembly 1	Determines 1-1, 1-2, 2-1, 2-2	
✹4.	Candidate evaluates Fuel Assembly 2	Determines 1-2, 2-2 Peripheral Cells	
✹5.	Candidate evaluates Fuel Assembly 3	Determines 1-1 Checkerboard, 1-2 and 2-2 Peripheral Cells	
	JPM Complete		

ANSWER KEY

	Region 1-1	Region 1-2	Region 2-1	Region 2-2
Assembly 1	YES	YES	YES	YES
Assembly 2	YES	YES	NO	PERIPHERAL
Assembly 3	CHECKERBOARD	YES	NO	PERIPHERAL

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

_____

Description of reviewed information:

_____

INITIATING CUES:

Three fuel assemblies in the spent fuel pit need to be moved to facilitate an inspection of the spent fuel rack in that area.

Fuel Assembly Data

Fuel Assembly 1
- Initial Enrichment 4.5 W/o
- Burnup 52,000 MWD/MTU
- In Spent Fuel Pit since April 2005
- Number of IFBA Rods 0

Fuel Assembly 2
- Initial Enrichment 4.6 W/o
- Burnup 32000 MWD/MTU
- In Spent Fuel Pit since March 2010
- Number of IFBA Rods 0

Fuel Assembly 3
- Initial Enrichment 4.95 W/o
- Burnup 0 MWD/MTU (New Fuel Assembly)
- Ins Spent Fuel Pit since January 2010
- Number of IFBA Rods 24

TASK STANDARD:

Acceptable Storage Regions identified for each fuel assembly.

SRO.
ADMIN

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to write a TPC for 2-AOP-ROD-1.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

During Simulator Training the crew observed that a step to place the P/A converter switch to manual before depressing the UP-DOWN pushbuttons was not included in the section for realigning a misaligned rod.

You are directed to prepare a TPC per IP-SMM-AD-102 step 6.5 for 2-AOP-ROD-1 to add a step for placing the P/A converter to Manual.

MERLIN is out of service for maintenance

TASK STANDARD:

TPC is completed for 2-AOP-ROD-1.

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Correct procedures	Obtains IP-SMM-AD-102 and 2-AOP-ROD-1	
3.	Observe NOTE before step 6.5.1	Observes Note	
✹4.	Determine change is NOT change of Intent	Review Definition 4.4	
✹5.	Determine the change is an Editorial TPC per step 4.23.3	Review step 4.23.3	
6.	Obtain DRN from MERLIN **CUE: Merlin is out of service**	Enter DRN number using 24 hour clock format "MMDDYYHHMM"	
7.	Review MERLIN to ensure new DRN will NOT conflict with existing DRNs/TPC against the procedure **CUE: MERLIN is out of service; no DRN/TPC exist for 2-AOP-ROD-1**	No action required	
✹8.	Enter new text as close as possible to the affected text.	Enter "Place and hold P/A converter toggle switch in MANUAL" after step 4.133	
✹9.	Place Revision Bars adjacent to change text	Manually enter Revision Bar	
✹10.	Place DRN number on Rev Bar	Enter DRN on Rev Bar	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
✸11.	Enter the following information on Attachment 10.2: • Procedure Title • Procedure Number • Existing Revision Number • Procedure Activity • Revision Summary • RPO Department • Writer	See Attached Key	
✸12.	If issuing an Editorial TPC enter corresponding reason for Editorial Change in Revision Summary	Enter "Step 4.6.11" in Revision Summary See Attached Key	
✸13.	Mark all boxes NO in Implementation Requirements: • Implementation Plan • Formal Training • Special Handling Required	All NO boxes checked See Attached Key	
✸14.	From Attachment 1 determine required reviews: • Technical Review **NO** • Cross Disciplinary Review **NO** • PAD **NO** • CRS/SM **YES** • User Validation **NO** • RPO **YES**	Correct boxes checked See Attached Key	
✸15.	Sign Writer Line of Attachment 10.2	Signs Writer Line	
	JPM Complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

IPEC IMPLEMENTING PROCEDURE PREPARATION, REVIEW, AND APPROVAL	IP-SMM-AD-102 Rev: 6
	Page 34 of 40

ATTACHMENT 10.2 **IPEC PROCEDURE REVIEW AND APPROVAL**

(Page 1 of 1)

Procedure Title: Rod Control and Indication Malfunction

Procedure No: 2-AOP ROD-1 Existing Rev: 6 New Rev: NA DRN No: MMDDYYHHMM

Procedure Activity (MARK Applicable)	☐ Converted To IPEC, Replaces:	Temporary Procedure Change (MARK Applicable)
☐ NEW PROCEDURE ☐ GENERAL REVISION ☐ PARTIAL REVISION ☒ EDITORIAL REVISION ☐ VOID PROCEDURE ☐ SUPERSEDED	Unit 1 Procedure No: Unit 2 Procedure No: Unit 3 Procedure No:	☒ EDITORIAL Temporary Procedure Change (Enter Step Number in Revision Summary) ☐ ADVANCE Temporary Procedure Change ☐ CONDITIONAL Temporary Procedure Change Terminating Condition:
☐ RAPID REVISION	Document in Microsoft Word: ☐ Yes ☐ No	☐ VOID DRN/TPC No(s):

Revision Summary ☐ N/A - See Revision Summary page.

Add step to place P/A converter switch to Manual to allow operation of P/A converter for misaligned rod recovery per IP-SMM-AD-102 step 4.6.11

Implementation Requirements

Implementation Plan? ☐ Yes ☒ No Formal Training? ☐ Yes ☒ No Special Handling? ☐ Yes ☒ No

RPO Dept: Operations Writer (Print Name/ Ext/ Sign): Name / Extension / Signature

Review and Approval (Per Attachment 10.1, IPEC Review And Approval Requirements)

1. ☐ Technical Reviewer: (Print Name/ Signature/ Date)
2. ☐ Cross-Disciplinary Reviewers:
   Dept: Reviewer: (Print Name/ Signature/ Date)
   Dept: Reviewer: (Print Name/ Signature/ Date)
3. RPO Responsibilities: (Print Name/ Signature/ Date)
   - ☐ PAD required and is complete (PAD Approver and Reviewer qualifications have been verified)
   - ☐ Previous exclusion from further LI-100 Review is still valid
   - ☒ PAD not required due to type of change
4. ☐ Non-Intent Determination Complete: (Print Name/ Signature/ Date)

   NO change of purpose or scope
   NO reduction in the level of nuclear safety
   NO voiding or canceling of a procedure, unless requirements are incorporated into another procedure or the need for the procedure was eliminated via an alternate process
   NO change to less restrictive acceptance criteria
   NO change to steps previously identified as commitment steps
   NO deviation from the Quality Assurance Program Manual
   NO change that may result in deviations from Technical Specifications, FSAR, plant design requirements, or previously made commitments
5. ☒ On-Shift Shift Manager/CRS: (Print Name/ Signature/ Date)
6. ☐ User Validation: User: Validator:
7. ☐ Special Handling Requirements Understood: (Print Name/ Signature/ Date)

KEY

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • An urgent failure alarm will occur if the affected rod is in <u>any</u> bank except Shutdown Bank C or D when the rod is moved due to <u>all</u> lift coil disconnect switches being open in the unaffected group. • If the rod fails to move, continuation through the procedure will reset the master cycler and <u>all</u> appropriate switches.	
4.126 __ Insert affected rod while maintaining TAVE on program (as applicable) until group step counter matches that recorded in Step 4.111.	
4.127 __ Is affected rod in Shutdown Bank C or Shutdown Bank D?	__ **GO TO** Step 4.129.
4.128 __ **GO TO** Step 4.137.	
4.129 __ Is affected rod a group 2 rod?	1. __ **IF** group 2 step counter reading is lower than group 1 step counter reading in affected bank, **THEN GO TO** Step 4.131. 2. __ **GO TO** Step 4.133.
4.130 __ Is group 2 step counter reading equal to group 1 step counter reading in affected bank?	
4.131 __ Insert affected rod one step.	
NOTE If the master cycler pulses past the group of concern, step sequencing will **NOT** be maintained. To prevent this, small "bumps" of the in-hold-out switch are necessary to only "pulse" the intended group.	
4.132 __ Withdraw affected rod one step.	
4.133 __ Is affected rod in a control bank?	__ **GO TO** Step 4.137.
4.133.1 Place and hold P/A Converter Switch in MANUAL 4.134 __ DEPRESS Up-Down pushbuttons to obtain bank position recorded in step 4.111.	DEN MADDYHH RM
4.135 __ RELEASE P/A converter toggle switch.	

KEY

ATTACHMENT 10.2 **IPEC PROCEDURE REVIEW AND APPROVAL**

(Page 1 of 1)

Procedure Title: _____

Procedure No: _____ Existing Rev: _____ New Rev: _____ DRN No: _____

Procedure Activity (MARK Applicable)	☐ Converted To IPEC, Replaces:	**Temporary Procedure Change** (MARK Applicable)
☐ NEW PROCEDURE ☐ GENERAL REVISION ☐ PARTIAL REVISION ☐ EDITORIAL REVISION ☐ VOID PROCEDURE ☐ SUPERSEDED	Unit 1 Procedure No: _____ Unit 2 Procedure No: _____ Unit 3 Procedure No: _____	☐ EDITORIAL Temporary Procedure Change (Enter Step Number in Revision Summary) ☐ ADVANCE Temporary Procedure Change ☐ CONDITIONAL Temporary Procedure Change Terminating Condition: _____
☐ RAPID REVISION	Document in Microsoft Word: ☐ Yes ☐ No	☐ VOID DRN/TPC No(s): _____

Revision Summary ☐ N/A - See Revision Summary page.____

_____

_____

Implementation Requirements

Implementation Plan? ☐ Yes ☐ No Formal Training? ☐ Yes ☐ No Special Handling? ☐ Yes ☐ No

RPO Dept: _____ Writer (Print Name/ Ext/ Sign): _____

Review and Approval (Per Attachment 10.1, IPEC Review And Approval Requirements)

1. ☐ Technical Reviewer: _____ (Print Name/ Signature/ Date)
2. ☐ Cross-Disciplinary Reviewers:
   Dept: _____ Reviewer: _____ (Print Name/ Signature/ Date)
   Dept: _____ Reviewer: _____ (Print Name/ Signature/ Date)
3. RPO Responsibilities: _____ (Print Name/ Signature/ Date)
   - ☐ PAD required and is complete (PAD Approver and Reviewer qualifications have been verified)
   - ☐ Previous exclusion from further LI-100 Review is still valid
   - ☐ PAD not required due to type of change
4. ☐ Non-Intent Determination Complete: _____ (Print Name/ Signature/ Date)

   NO change of purpose or scope
   NO reduction in the level of nuclear safety
   NO voiding or canceling of a procedure, unless requirements are incorporated into another procedure or the need for the procedure was eliminated via an alternate process
   NO change to less restrictive acceptance criteria
   NO change to steps previously identified as commitment steps
   NO deviation from the Quality Assurance Program Manual
   NO change that may result in deviations from Technical Specifications, FSAR, plant design requirements, or previously made commitments
5. ☐ On-Shift Shift Manager/CRS: _____ (Print Name/ Signature/ Date)
6. ☐ User Validation: User: _____ Validator: _____
7. ☐ Special Handling Requirements Understood: _____ (Print Name/ Signature/ Date)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- An urgent failure alarm will occur if the affected rod is in any bank except Shutdown Bank C or D when the rod is moved due to all lift coil disconnect switches being open in the unaffected group.
- If the rod fails to move, continuation through the procedure will reset the master cycler and all appropriate switches.

4.126__ Insert affected rod while maintaining TAVE on program (as applicable) until group step counter matches that recorded in Step 4.111.	
4.127__ Is affected rod in Shutdown Bank C or Shutdown Bank D?	__ **GO TO** Step 4.129.
4.128__ **GO TO** Step 4.137.	
4.129__ Is affected rod a group 2 rod?	1.__ **IF** group 2 step counter reading is lower than group 1 step counter reading in affected bank, **THEN GO TO** Step 4.131. 2.__ **GO TO** Step 4.133.
4.130__ Is group 2 step counter reading equal to group 1 step counter reading in affected bank?	
4.131__ Insert affected rod one step.	

NOTE

If the master cycler pulses past the group of concern, step sequencing will **NOT** be maintained. To prevent this, small "bumps" of the in-hold-out switch are necessary to only "pulse" the intended group.

4.132__ Withdraw affected rod one step.	
4.133__ Is affected rod in a control bank?	__ **GO TO** Step 4.137.
4.134__ DEPRESS Up-Down pushbuttons to obtain bank position recorded in step 4.111.	
4.135__ RELEASE P/A converter toggle switch.	

SRO
ADMIN

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

Review a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to review a radioactive liquid release in accordance with SOP-5.1.5

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. The Unit is operating at 100% power.
2. All radiation monitors are operable.
3. Waste Distillate Storage Tank #14 is to be discharged, tank level, as reported by the NPO, is 71 inches.
4. WDST has been isolated and on recirc for the past 5 hours.
5. R-54 is aligned to #14 WDST.
6. A Manual Radioactive Liquid Release Permit was prepared by the FSS.
7. You are directed to review and approve the Liquid Release Permit in accordance with 2-SOP-5.1.5. STOP
8. Additional Data:

May or May not approve?

Permit Number	100300
Tank ID	14 WDST
Initial Tank Level	71
Pre-release volume	16,351
Recirculation Rate	150 gpm
Recirc Start-	Today 5 hours ago
Recirc Stop	Today Now
Chem Sample Number	3906
Sample Date/Time	Today 15 minutes ago
Total Gamma Activity	4.0E-5 → units ?
ADC	5.31E-7
ppm Boron in tank	632
Pump Configuration	6 CWPs in Fast, 3 SWPs, 0 RWPs

TASK: You are BOP or US review the

TASK STANDARD:

Radioactive liquid waste release calculation reviewed and release permit (Attachment 1 to SOP-5.1.5) approved.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation **Time Commenced: _____**		
2.	Review Precautions and Limitations CUE: When requested, inform operator all P&Ls are satisfied	Precautions and Limitations Reviewed	
3.	Determine required recirculation time for the tank to be released	Determine minimum recirculation time to be 218 minutes from Table 1	
●4.	Determine Total Dilution Flow CUE: 6 CWP Fast Speed 3 SWP 0 RWP	Sum flowrate based on current pump combinations. Calculate 855,000 gpm **Determines data correct on permit**	
5.	Assign Permit Number **CUE:** Permit Number 100300	Initial Conditions	

Review a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
6.	Review data on Attachment 1 CUE: Permit Number 100300 Tank ID 14 WDST Initial Tank Level 71 Pre-release volume 16,351 Recirculation Rate 150 gpm Recirc Start- Today 5 hours ago Recirc Stop Today Now Chem Sample Number 3906 Sample Date/Time Today 15 minutes ago Total Gamma Activity 4.0E-5 ADC 5.31E-7 ppm Boron in tank 632	Supplied with Initial condition. Check data on form	
7.	Verify from Chemistry total gamma activity without noble gas is less than 5.0E-5 µCi/ml. CUE: Chemist reports total gamma activity < 5.0E-5 µCi/ml. If requested, R54 activity is 2.4E-5µCi/cc	Simulate Contact Chemist Provide as part of Summary	
8.	Record Available Dilution Flowrate	Previously calculated 855,000 gpm	
●9.	Calculate pounds of Boron in Tank and Maximum Allowable Chemical Release Rate	Performs calculation determines 86 (±1) pounds of boron and Chem release rate 1352 (±2) **Determines data correct on permit**	
●10.	Calculate the Permissible Radioactive Release Rate	Performs calculation determines rad. Release rate 11350 (±5) **Determines data NOT correct on permit**	

Review a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Candidate may terminate JPM at this time due to identified error		
11.	Determine most restrictive release rate	Identifies Pump Capacity 250 most restrictive **Determines data correct on permit**	
12.	Determine effluent rad monitor in service and calculate maximum alarm	Calculates Max Alarm Setpoint 1.816E-3 **Determines data correct on permit**	
13.	Determine permit improperly completed and **does not** sign Release Authorized By block	**Does Not** Sign Release Authorized By block	

Review a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

ANSWER KEY
EXAMPLE RADIOACTIVE LIQUID RELEASE PERMIT
(Page 1 of 1)

PERMIT # 10300 TANK ID 14 WDST INITIAL Tank Level: 71 (Inches) 16351 Volume (V), gal

RECIRC RATE : 150 gpm

Recirc Start: 7/14/10 (Date) 00:00 (Time)

Recirc Stop: 7/14/10 (Date) 05:00 (Time)

Chemistry Sample No. 3906 Sample Collection : 7/14/10 (Date) 04:30 (Time)

Gamma Activity without Gas and Tritium is less than the admin limit of SMM-CY-001: **Yes** / No

Total Gamma Activity **4.0E-5** µCi/ml Allowed Diluted Concentration (ADC) **5.31E-7** µCi/ml

TOTAL DILUTION FLOW (T) **855,000** (GPM) From: 6 Unit 2 Circulators, 0 Unit 3 Circulators, 3 Service Water Pumps

BORON: 632 (ppm B) x 16351 (tank vol (V), gal) x 8.33E-6 = **86**

Maximum Chemical Release Rate (Rc) = (**855,000** (Avail Dil Flow (B), gpm) x 1 ppm) ÷ 632 (ppm B) = **1352**

Value on candidate copy is incorrect. These are the correct values

Radioactive Release Rate: (Rr) = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **4.0E-5** (Gamma Act (C), uCi/ml) = **11350** gpm

Most Restrictive Release Rate (R) = **250** gpm (pump capacity most limiting)

Rad Monitor # **54** SOURCE CHECKED **X** OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATT 3)

Maximum Alarm Setpoint = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **250** (Most Restrictive Release Rate (R), gpm) = **1.816E-3** uCi/ml

Actual Alarm Setpoint = **4.0E-4** uCi/ml Warn Setpoint = **3.0E-4** uCi/ml

DISCHARGE FLOW METER & RECORDER OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATTACHMENT 3)

Release Authorized By: _____ _____ (Date)

RELEASE INITIATED: _____ (Date) _____ (Time)

RELEASE TERMINATED: _____ (Date) _____ (Time)

FINAL TK LEVEL: _____ (Inches) _____ gal TOTAL VOLUME RELEASED _____ gal

Remarks:

Blankout put after the

ATTACHMENT 1
EXAMPLE RADIOACTIVE LIQUID RELEASE PERMIT
(Page 1 of 1)

PERMIT # 10300 TANK ID 14 WDST INITIAL Tank Level: 71 (Inches) 16351 Volume (V), gal

RECIRC RATE : 150 gpm

Recirc Start: 7/14/10 (Date) 00:00 (Time)

Recirc Stop: 7/14/10 (Date) 05:00 (Time)

Chemistry Sample No. 3906 Sample Collection : 7/14/10 (Date) 04:30 (Time)

Gamma Activity without Gas and Tritium is less than the admin limit of SMM-CY-001: **Yes** / No

Total Gamma Activity **4.0E-5** µCi/ml Allowed Diluted Concentration (ADC) **5.31E-7** µCi/ml

TOTAL DILUTION FLOW (T) **855,000** (GPM) From: 6 Unit 2 Circulators; 0 Unit 3 Circulators; 3 Service Water Pumps

BORON: 632 (ppm B) x 16351 (tank vol (V), gal) x 8.33E-6 = **86** pounds

Maximum Chemical Release Rate (Rc) = (**855,000** (Avail Dil Flow (B), gpm) x 1 ppm) ÷ 632 (ppm B) = **1352** gpm

Radioactive Release Rate: (Rr) = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **5.0E-4** (Gamma Act (C), uCi/ml) = **908** gpm

Most Restrictive Release Rate (R) = **250** gpm (pump capacity most limiting)

Rad Monitor # **54** SOURCE CHECKED **X** OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATT 3)

Maximum Alarm Setpoint = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **250** (Most Restrictive Release Rate (R), gpm) = **1.816E-3** uCi/ml

Actual Alarm Setpoint = **4.0E-4** uCi/ml Warn Setpoint = **3.0E-4** uCi/ml

DISCHARGE FLOW METER & RECORDER OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATTACHMENT 3)

Release Authorized By: _____ _____ (Date)

RELEASE INITIATED: _____ (Date) _____ (Time)

RELEASE TERMINATED: _____ (Date) _____ (Time)

FINAL TK LEVEL: _____ (Inches) _____ gal TOTAL VOLUME RELEASED _____ gal

Remarks:

INITIATING CUES:

1. The Unit is operating at 100% power.

2. All radiation monitors are operable.

3. Waste Distillate Storage Tank #14 is to be discharged, tank level, as reported by the NPO, is 71 inches.

4. WDST has been isolated and on recirc for the past 5 hours.

5. R-54 is aligned to #14 WDST.

6. A Manual Radioactive Liquid Release Permit was prepared by the FSS.

7. You are ~~directed to~~ assigned the USAS to review and approve the Liquid Release Permit in accordance with 2-SOP-5.1.5.

8. Additional Data:

Permit Number	100300
Tank ID	14 WDST
Initial Tank Level	71
Pre-release volume	16,351
Recirculation Rate	150 gpm
Recirc Start-	Today 5 hours ago
Recirc Stop	Today Now
Chem Sample Number	3906
Sample Date/Time	Today 15 minutes ago
Total Gamma Activity	4.0E-5
ADC	5.31E-7
ppm Boron in tank	632
Pump Configuration	6 CWPs in Fast, 3 SWPs, 0 RWPs

TASK STANDARD:

Radioactive liquid waste release calculation reviewed and release permit (Attachment 1 to SOP-5.1.5) approved. don't approve identify bad data

Conferring

SRO ADMIN

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

This is a Time Critical task. You have 15 MINUTES from the time you are told to begin until you classify the event. You have 15 MINUTES from the time you classify the event until you complete the radiological emergency data form.

When I tell you to begin, you are to classify the event and complete the Radiological Emergency Data Form as required by the Emergency Plan Implantation Procedures.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

Both Units are operating at 100% power. The CCR is notified of a credible threat via the NRC ENS line. The CCR is responding per AOP-SEC-1. During their response, Security CAS notifies the CCR that

- The security fences north of the dry cask storage area have been breached.
- The Aux Boiler Feed Pump Building door has been found open

METEOROLOGICAL CONDITIONS:

Wind Speed:	1.7 meters/second
Wind Direction:	097 degrees @ 10 meters
Stability Class:	C

TASK STANDARD:

As the Shift Manager, classify the event. Complete and return to me the required Radiological Emergency Data Form as required by the Emergency Plan.

✱ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Obtain correct procedure IP-EP-120 **Time Commenced: _____**		
✱2.	The SM shall evaluate Plant Status Sheet to determine IF a GE, SAE, ALERT or NUE classification applies, AND IF so, determine the highest classification and declare it. **Note: Declaration must be made within 15 minutes of start of JPM** **Time Declaration Made: _____**	**EAL (8.1.7) SAE**	
✱3.	Complete and Approve "New York State Radiological Emergency Data Form, Part 1" **Note: MUST BE COMPLETED WITHIN 15 MINUTES OF DECLARATION** Obtain filled out Radiological Emergency Data Form, Part "1" from MEANS and retain as part of JPM package. **Time IP-EP-115 Form 1 completed: _____**	Complete IP-EP-115 Form 1 Verify Data using Radiological Emergency Data Form Information, item #s 4, 5, 7, 8, 11, 12 & 13	
4.	Initiate County, State AND NRC notification in accordance with IP-EP-130 CUE: Acknowledge as communicator when requested to commence notifications.	Request for CCR comunicator	

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Radiological Emergency Data Form Information

EAL# (**8.1.7**), Intrusion into a plant vital area by a hostile force.

Reactor Status:	Operational
Plant Status:	Stable
Release Status:	No Release
Wind Speed:	1.7 meters/second
Wind Direction:	097 degrees @ 10 meters
Stability Class:	C

New York State

Indian Point Energy Center
RADIOLOGICAL EMERGENCY DATA FORM - PART 1 Notification # 1

This is the Indian Point Energy Center with a Part 1 Notification on: TODAYS DATE

1. Reactor Status:
This is an: (EXERCISE) ACTUAL EMERGENCY at: UNIT 2 UNIT 3 (BOTH UNITS)
Unit 2 (Operational) Shutdown (Date) TODAY (Time) CURRENT TIME (24 hr clock)
Unit 3 (Operational) Shutdown (Date) TODAY (Time) CURRENT TIME (24 hr clock)

2. The Emergency Classification is: C
A. Unusual Event B. Alert (C.) Site Area Emergency
D. General Emergency E. Emergency Terminated
This Emergency Classification declared on: TODAY (Date) at TIME OF DECLARATION (Time 24 hr clock)

3. EAL#: 8.1.7 INTRUSION INTO A PLANT VITAL AREA BY A HOSTILE FORCE

4. Release of Radioactive Materials due to the Classified Event: A
(A.) No Release B. Release BELOW Federal limits To Atmosphere To Water
C. Release ABOVE Federal limits To Atmosphere To Water D. Unmonitored release requiring evaluation

5. Wind Speed: 1.7 Meters/Sec at elevation 10 meters

6. Wind Direction: (From) 197 Degrees at elevation 10 meters

7. Stability Class: A B (C) D E F G

8. The following Protective Actions are recommended to be implemented as soon as practicable: A
(A.) NO NEED for PROTECTIVE ACTIONS outside the site boundary
B. EVACUATE and IMPLEMENT the KI PLAN for the following Sectors
C. SHELTER-IN-PLACE and IMPLEMENT the KI PLAN for the following Sectors
All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM
2 miles around 5-miles downwind 5 miles around 10-miles downwind Entire EPZ
In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

ANSWER KEY

9. Reported by – Communicator: _____ Telephone # _____
(Communicator's Name)

10. Emergency Director Approval: Signature Date/Time: TODAYS DATE/TIME
(Director's Name)

File: (JPM030EP-12.doc)
Parent Task # 1500010503

Difficulty: 3
IP-EP-120

Time: 30 minutes
Administrative

THIS IS A TIME CRITICAL JOB PERFORMANCE MEASURE
15 minutes from instructions to begin to Classification to make declaration
15 minutes from Classification to starting Notification

They should know this?

INITIATING CUES:

Both Units are operating at 100% power. The CCR is notified of a credible threat via the NRC ENS line. The CCR is responding per AOP-SEC-1. During their response, Security CAS notifies the CCR that

- The security fences north of the dry cask storage area have been breached.
- The Aux Boiler Feed Pump Building door has been found open

METEOROLOGICAL CONDITIONS:

Wind Speed:	1.7 meters/second
Wind Direction:	097 degrees @ 10 meters
Stability Class:	C ← How is this normally

TASK ~~STANDARD:~~ or Initiating Cue

As the Shift Manager, classify the event. Complete and return to me the required Radiological Emergency Data Form as required by the Emergency Plan.

New York State

Indian Point Energy Center

RADIOLOGICAL EMERGENCY DATA FORM - PART 1 Notification # ____

This is the Indian Point Energy Center with a Part 1 Notification on:_____

1.

Reactor Status:

This is an: EXERCISE ACTUAL EMERGENCY at: UNIT 2 UNIT 3 BOTH UNITS

Unit 2 Operational

(Date)_____ (Time) _____ (24 hr clock)

Shutdown

Unit 3 Operational

(Date) _____ (Time) _____ (24 hr clock)

Shutdown

2. The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency D. General Emergency E. Emergency Terminated

This Emergency Classification declared on: _____ at _____

(Date) (Time 24 hr clock)

3. EAL#: _____

4. Release of Radioactive Materials due to the Classified Event:

A. No Release B. Release BELOW Federal limits To Atmosphere To Water

C. Release ABOVE Federal limits To Atmosphere To Water D. Unmonitored release requiring evaluation

5. Wind Speed: _____ Meters/Sec at elevation 10 meters

6. Wind Direction: (From) _____ Degrees at elevation 10 meters

7. Stability Class: A B C D E F G

8.

The following Protective Actions are recommended to be implemented as soon as practicable:

A. NO NEED for PROTECTIVE ACTIONS outside the site boundary

B. EVACUATE and IMPLEMENT the KI PLAN for the following Sectors

C. SHELTER-IN-PLACE and IMPLEMENT the KI PLAN for the following Sectors

All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM

2 miles around 5-miles downwind 5 miles around 10-miles downwind Entire EPZ

In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

9. Reported by – Communicator: _____ Telephone # _____

(Communicator's Name)

10. Emergency Director Approval: _____ Date/Time: _____

(Director's Name)

New York State

Indian Point Energy Center
RADIOLOGICAL EMERGENCY DATA FORM - PART 1

Notification # 1

This is the Indian Point Energy Center with a Part 1 Notification on: TODAYS DATE

1. Reactor Status:
This is an: EXERCISE ACTUAL EMERGENCY at: UNIT 2 UNIT 3 BOTH UNITS

Unit 2 Operational Shutdown (Date) TODAY (Time) CURRENT TIME (24 hr clock)

Unit 3 Operational Shutdown (Date) TODAY (Time) CURRENT TIME (24 hr clock)

2. The Emergency Classification is: C

A. Unusual Event B. Alert C. Site Area Emergency D. General Emergency E. Emergency Terminated

This Emergency Classification declared on: TODAY (Date) at TIME OF DECLARATION (Time 24 hr clock)

3. EAL#: 8.1.7 INTRUSION INTO A PLANT VITAL AREA BY A HOSTILE FORCE

4. Release of Radioactive Materials due to the Classified Event: A

A. No Release B. Release BELOW Federal limits To Atmosphere To Water

C. Release ABOVE Federal limits To Atmosphere To Water D. Unmonitored release requiring evaluation

5. Wind Speed: 1.7 Meters/Sec at elevation 10 meters

6. Wind Direction: (From) 197 Degrees at elevation 10 meters

7. Stability Class: A B C D E F G

8. The following Protective Actions are recommended to be implemented as soon as practicable: A

A. NO NEED for PROTECTIVE ACTIONS outside the site boundary

B. EVACUATE and IMPLEMENT the KI PLAN for the following Sectors

C. SHELTER-IN-PLACE and IMPLEMENT the KI PLAN for the following Sectors

All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM

2 miles around 5-miles downwind 5 miles around 10-miles downwind Entire EPZ

In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

9. Reported by – Communicator: _____ Telephone # _____
(Communicator's Name)

10. Emergency Director Approval: Signature Date/Time: TODAYS DATE/TIME
(Director's Name)

New York State

Indian Point Energy Center
RADIOLOGICAL EMERGENCY DATA FORM - PART 1 Notification # ____

This is the Indian Point Energy Center with a Part 1 Notification on:_____

1. Reactor Status:
This is an: EXERCISE ACTUAL EMERGENCY at: UNIT 2 UNIT 3 BOTH UNITS
Unit 2 Operational
(Date)_____ (Time) _____ (24 hr clock)
Shutdown
Unit 3 Operational
(Date) _____ (Time) _____ (24 hr clock)
Shutdown

2. The Emergency Classification is: A. Unusual Event B. Alert C. Site Area Emergency D. General Emergency E. Emergency Terminated

This Emergency Classification declared on: _____ at _____
(Date) (Time 24 hr clock)

3. EAL#: _____

4. Release of Radioactive Materials due to the Classified Event:
A. No Release B. Release BELOW Federal limits To Atmosphere To Water
C. Release ABOVE Federal limits To Atmosphere To Water D. Unmonitored release requiring evaluation

5. Wind Speed: _____ Meters/Sec at elevation 10 meters

6. Wind Direction: (From) _____ Degrees at elevation 10 meters

7. Stability Class: A B C D E F G

8. The following Protective Actions are recommended to be implemented as soon as practicable:
A. NO NEED for PROTECTIVE ACTIONS outside the site boundary
B. EVACUATE and IMPLEMENT the KI PLAN for the following Sectors
C. SHELTER-IN-PLACE and IMPLEMENT the KI PLAN for the following Sectors
All remaining Areas MONITOR the EMERGENCY ALERT SYSTEM
2 miles around 5-miles downwind 5 miles around 10-miles downwind Entire EPZ
In the following Sectors: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
NOTE: OFFSITE AUTHORITIES SHOULD CONSIDER SHELTER-IN-PLACE + TAKE KI IF EVACUATION IS NOT FEASIBLE

9. Reported by – Communicator: _____ Telephone # _____
(Communicator's Name)

10. Emergency Director Approval: _____ Date/Time: _____
(Director's Name)

Facility: Indian Point Unit 2 Date of Examination: July 12, 2010

Examination Level: **RO X** SRO ☐ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	**Calculate Shutdown Margin** with Untrippable Rod 2.1.25 Ability to interpret reference materials such as graphs, curves, tables etc. 2.1.19 Ability to use plant computers to evaluate system or component status
Conduct of Operations	N, S	**Perform IR NIS COL (Control Room)** 2.1.29 Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.
Equipment Control	N, R	**Tagout 21 Safety Injection Pump** 2.2.13 Knowledge of tagging and clearance procedures.
Radiation Control	M, R, P	**Calculate a Liquid Radiation Release Permit** 2.3.11 Ability to control radiation releases.
Emergency Procedures/Plan		Not Applicable for RO

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

INDIAN POINT UNIT 2 NRC RO EXAMINATION

CONDUCT OF OPERATIONS: Calculate Shutdown Margin – The candidate will be given a set of conditions and asked to calculate Shutdown Margin. This is accomplished using any computer with access to the IPEC intranet to obtain current plant data from the On-Line NuPOP. The data is entered in the SDM calculation section of WRC-1.

- This is a New JPM
- RO Only

CONDUCT OF OPERATIONS: Perform IR NIS COL (Control Room) – The candidate is directed to perform the control room section of the IR NIS Check Off List. One switch will be out of position. The candidate must identify this switch and inform the CRS.

- This is a New JPM
- RO Only

EQUIPMENT CONTROL: Tagout 21 Safety Injection Pump – The candidate will be given plant prints and associated procedures and directed to prepare a manual tagout for the 21 Safety Injection Pump for seal replacement. NOTE: Manual tagout JPMs exist in the JPM Bank; however, this component (21 Safety Injection Pump) is new and has not been used before.

- This is a New JPM
- RO Only

RADIATION CONTROL: Calculate a Liquid Radiation Release Permit. This JPM has modified values from the existing bank version

- This is a Modified Bank JPM
- RO Only

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to Calculate Shutdown Margin with an Untrippable Rod.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

During performance of 2-PT-Q089 Control Rod Exercise Test, Rod F-14 did not move. I&C has determined that the rod is mechanically bound in place (Untrippable).

The CRS has directed you to Calculate Shutdown Margin with an Untrippable Rod.

Current Plant Data:
Cycle Burnup 999 MWD/MTU
Current Boron concentration 1140 ppm
Relative Power 100%

TASK STANDARD:

Shutdown Margin Calculation complete. CRS informed of results.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation	Record Time	
2.	Obtain Correct Procedure	Obtains current revision of 2-WCR-1	
●3.	Go to Indian Point Energy Center web page and select Operations Department	Log into a computer and open Operations web page.	
●4.	On the Operations Web Page select Unit 2 NuPOP	"Click" on Unit 2 NuPOP	
●5.	Select the "Run" button to Open File	"Click" on Run button	
●6.	Observe NOTE before step 4	Observes Note to leave spreadsheet open	
●7.	When Acrobat Reader is up, select Bookmarks on the left pane then select '+' box associated with "B Supporting Excel Files" to Open the files	"Click" '+' box	
●8.	Select Table B-1, Summary of Supporting Excel Files	Select Table B-1	
●9.	Scroll down and select TPD7 File Name.xls and Select open/enable Macros.	Select TPD7	
10.	Enter current data for the following:	See Below	
●	Cycle Burnup	Enter **999**	
●	Enter specific boron concentration	Enter **1140**	
●	Enter Relative Power	Enter **100**	
●11.	Record Total Power Defect on Line #1	Record **1509**	
●12.	Go to Table B-1 Summary of Supporting Excel Files, Select Shutdown Margin and Open when prompted to open spreadsheet	Select Shutdown Margin and Click Open when prompted	
●13.	Select HZP SDM Rackup tab	Select correct tab	

Calculate Shutdown Margin with Untrippable Rod

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
14.	Multiply row 11 value by 1000 and record on Line 2	Records **5730**	
15.	Enter 900 on Line 3 to account for Untrippable rod	Enter **900**	
16.	Add lines 1 – 3 to record Shutdown Margin	Calculate **3221** 3121 or 3221	
~~17.~~	Ensure Shutdown Margin is greater than value in COLR	Determines SDM is greater than COLR	
18.	Close Unit 2 NuPOP Excel Spreadsheets Do not save data	Close Spreadsheet does not save data	
19.	JPM is complete	NA	

adjust calculation such that SDM will be < COLR

Go step 17 Based on Calc

What is value of COLR? Is it less than or greater than?

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

(Page 2 of 3)

CALCULATE SHUTDOWN MARGIN (SDM) AT POWER WITH AN UNTRIPPABLE ROD		
1.	Determine Power Defect	(+) 1509 PCM
2.	Determine control bank worth and shutdown bank worth with the most reactive rod cluster stuck out	(-) 5730 PCM
3.	In the event a rod is known to be untrippable, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth Cycle 19: (BOL=900; EOL=780)	(+) 900 PCM
4.	Shutdown Margin **{SR 3.1.1.1 bases}** (total items 1 through 3)	(-) 3121 PCM

1) IF desired to CALCULATE SDM at power with an untrippable rod, THEN GO TO the Indian Point Entergy Center web page AND select (click, using the mouse) Departments and select (click) Operations.

see Step 16

2) On the Operations page, SELECT (click) Unit 2 / Unit 2 NuPOP.

3) WAIT and when prompted, SELECT the 'Run' button to open the file.

NOTE

Leave the coefficients spreadsheet (Coeffs.xls) open while using the NuPOP.

4) WHEN the Acrobat Reader is up, SELECT Bookmarks on the left pane THEN SELECT the '+' box associated with "B Supporting Excel Files" to OPEN the files.

5) SELECT Table B-1, Summary of Supporting Excel Files.

6) To OBTAIN Power Defect, scroll down (second page) to select the 'TPD7' File Name.xls AND select open / Enable Macros.

7) ENTER current data for the following (using the 'Tab' or '↓' or click the applicable box):

   a. Cycle Burnup (MWD/MTU).

   b. Specified Boron Concentration (pcm).

   c. Relative Power (%).

   d. WHEN all the values are submitted, THEN RECORD on line #1 above, the Total Power Defect for ECP (pcm).

Answer Key

2-WCR-1
Rev 8

J Candelaria

INITIATING CUES:

During performance of 2-PT-Q089 Control Rod Exercise Test, Rod F-14 did not move. I&C has determined that the rod is mechanically bound in place (Untrippable).

The CRS has directed you to Calculate Shutdown Margin with an Untrippable Rod.

Current Plant Data:

Cycle Burnup 999 MWD/MTU
Current Boron concentration 1140 ppm
Relative Power 100%

TASK STANDARD:

Shutdown Margin Calculation complete. CRS informed of results.

Initiating Cue

NOTE:
Seems like it would be a better task to Calculate Manually SDM without Computer
Task looks perhaps TOO EASY non discriminatory

Ray ?

CALCULATE SHUTDOWN MARGIN (SDM) AT POWER WITH AN UNTRIPPABLE ROD

1.	Determine Power Defect	(+) 1509 PCM
2.	Determine control bank worth and shutdown bank worth with the most reactive rod cluster stuck out	(-) 5730 PCM
3.	In the event a rod is known to be untrippable, SDM verification must account for the worth of the untrippable rod as well as another rod of maximum worth Cycle 19: (BOL=900; EOL=780)	(+) 900 PCM
4.	Shutdown Margin **{SR 3.1.1.1 bases}** (total items 1 through 3)	(-) 3121 PCM

1) IF desired to CALCULATE SDM at power with an untrippable rod, THEN GO TO the Indian Point Entergy Center web page AND select (click, using the mouse) Departments and select (click) Operations.

2) On the Operations page, SELECT (click) Unit 2 / Unit 2 NuPOP.

3) WAIT and when prompted, SELECT the 'Run' button to open the file.

NOTE

Leave the coefficients spreadsheet (Coeffs.xls) open while using the NuPOP.

4) WHEN the Acrobat Reader is up, SELECT Bookmarks on the left pane THEN SELECT the '+' box associated with "B Supporting Excel Files" to OPEN the files.

5) SELECT Table B-1, Summary of Supporting Excel Files.

6) To OBTAIN Power Defect, scroll down (second page) to select the 'TPD7' File Name.xls AND select open / Enable Macros.

7) ENTER current data for the following (using the 'Tab' or '↓' or click the applicable box):

   a. Cycle Burnup (MWD/MTU).

   b. Specified Boron Concentration (pcm).

   c. Relative Power (%).

   d. WHEN all the values are submitted, THEN RECORD on line #1 above, the Total Power Defect for ECP (pcm).

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

Signature

Replace
Just verify
Compile lights &
Sentence

Doesn't appear
for
the
discussion

No critical
steps

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to Perform the Control Room portion of the Intermediate Range NI Check Off List.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

al Conlitos

INITIATING ~~CUES~~:

The plant is at 100% power. Intermediate Range Channel N-35 was removed from service due to erratic operations. All actions of 2-AOP-INST-1, Instrument or Controller Failures have been completed.

Repairs to Channel N-35 have been completed.

The CRS has directed you to perform the Intermediate Range Channel N35 portion of 2-COL-13.1 section 1.3

TASK STANDARD:

Section 1.3 of 2-COL-13.1 complete.

Initiating Cue

Perform Intermediate Range Check Off Test

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain current copy of procedure	Obtains 2-COL-13.1	
3.	Level Trip Switch in Normal	Switch in Normal	
4.	Operation Selector Switch in Normal	Switch in Normal	
✹5.	Test Mode Switch in Fixed	Candidate Notes Switch in Variable	
✹6.	List Test Mode Switch position in Table on Page 4 of COL	Enters Test Mode Switch in Table	
7.	Instrument Power On Light Illuminated	Light ON	
8.	Control Power On Light Illuminated	Light ON	
9.	Loss of Comp. Detector Light Extinguished	Light OFF	
10.	Loss of Comp. Volt. Light Extinguished	Light OFF	
11.	Instrument Power Fuses (2) Installed	Fuses Installed	
12.	Control Power Fuses (2) Installed	Fuses Installed	
✹13.	Notify CRS that Test Mode Switch is out of COL Position **CUE: CRS Acknowledges**	don't even install switches	
14.	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Reset simulator to any IC

Place TEST MODE switch to VARIABLE

Initial Conditions

INITIATING CUES:

The plant is at 100% power. Intermediate Range Channel N-35 was removed from service due to erratic operations. All actions of 2-AOP-INST-1, Instrument or Controller Failures have been completed.

Repairs to Channel N-35 have been completed.

The CRS has directed you to perform the Intermediate Range Channel N35 portion of 2-COL-13.1 section 1.3

TASK STANDARD:

Section 1.3 of 2-COL-13.1 complete.

Initiating Cue

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to prepare a manual tagout for 21 SI Pump for seal replacement.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

al andrews

INITIATING ~~CUES:~~

1 The eSOMS Clearance Module is unavailable.

2 The Shift Manager has determined that 21 Safety Injection Pump must be tagged out for seal replacement.

3 Clearance Number is 2C20

4 Tagout Number is SI-001.

5 You are directed to prepare a manual tagout for 21 Safety Injection Pump using EN-OP-102 and EN-OP-102-01.

TASK STANDARD:

Manual Tagout Complete and ready for review.

Initiating Cue

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation **Time Commenced: _____**		
2.	Obtain Correct Procedure	Obtains EN-OP-102 EN-OP-102-01	
3.	Ensure requirement of Attachments 9.1 and 9.2 of EN-OP-102 are followed	Review Attachment 9.1 and 9.2	
4.	Review Scope of Work	Tagout Required for emergent work	
5.	Review Tagging Requirements	Tagout Required for emergent work	
✹6.	Determine Safe Work Boundary for filter replacement	Review Plant Prints 208088 225134 208500 225134 241171 9321-2735	
7.	Boundary Valves should be reviewed for outstanding deficiencies CUE: No deficiencies exist on valves identified in tagout boundary	Determines no outstanding deficiencies	
✹8.	Complete Attachment 9.1 and 9.2 of EN-OP-102-01	See Attached Answer Key	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
*9.	Utilizing the Isolation Boundaries, Prepare the tagout For each tag include: • Tag Serial Number • Tag Type • Equipment • Equipment Description (Not required) • Equipment Location • Placement Sequence • Placement Configuration • Restoration Configuration	See attached Answer Key	
	JPM is complete		

Should ~~need to~~ list each component & required tag position & restoration each critical task?

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

ATTACHMENT 9.1 **MANUAL TAGOUT INDEX SHEET**

CLEARANCE _____

TAGOUT #	COMPONENT TO BE WORKED	DATE HUNG	DATE REMOVED
SI-001	**21 Safety Injection Pump Seal**		
	Answer Key		

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OP-102-01	REV. 6
		INFORMATIONAL USE	PAGE 6 OF 25	

Protective and Caution Tagging Forms & Checklist

ATTACHMENT 9.1 **TAGOUT COVER SHEET**

Clearance: ___ **MANUAL** 123456 **Tagout:** SI-001

Component to be worked:
21 SI Pump

Description
21 SI Pump has a seal leak. Tagout and drain pump for seal replacement

Placement Inst:
See Attached

Answer Key

Hazards:
See Attached

Restoration Inst:
See Attached

Attribute Description	Attribute Value

Work Order Number	Description

Status	Description	User	Verification Date
Prepared	Prepared		
Technical Reviewed	Reviewed		
Approved	Approved		
Tags Verified Hung	Tags Verified Hung		
Removal Approved	Removal Approved		
Tags Verified Removed	Tags Verified Removed		

Tag Serial No.	Tag Type	Equipment Equipment Description Equipment Location	Place Seq.	Placement Configuration	Place 1st Verif Date/Time	Place 2nd Verif Date/Time	Rest Seq	Restoration Configuration	Rest 1st Verif Date/Time	Place 2nd Verif Date/Time	Placement/Removal Tag Notes
1	Danger	21 Safety Injection Pump 480V Bus 5A Control Switch CCR Pnl SBF-2	1	Pullout				Auto			
2	Danger	21 Safety Injection Pump Breaker Control Fuses 480 V Room Bus 5A	2	Removed/Off				Installed/On			
3	Danger	21 Safety Injection Pump breaker 480V room Bus 5A	3	Racked Out				Racked/In			
4	Danger	MOV-850A 21 SI Pump Discharge Valve 98' PAB MCC Room	4	Closed/ Neutral				Open/ Neutral			
5	Danger	MOV-850A 21 SI Pump Discharge Valve Breaker 98' PAB MCC Room	5	OFF				OFF/Locked			
6	Danger	MOV-850A Manual Operator PAB 59' SI Pump Cell	6	Do Not Operate				Do Not Operate/ Locked			
7	Danger	SI-1807A 21 SI Pump Recirc Test Line Stop PAB 59' SI Pump Cell	7	Closed				Backseated Open/ Locked			
8	Danger	SI848A 21 Safety Injection Pump Suction Stop PAB 59' SI Pump Cell	8	Closed				Backseated Open/ Locked			
9.	Danger	SI-1843A 21 SI Pump Thrust Balance Flow Line Stop PAB 59' SI Pump Cell	9	Closed				Backseated Open			
10	Danger	SI-4274-Cap Cap Downstream of drain valve 7306 PAB 59' SI Pump Cell	10	Cap Removed				Installed			
11	Danger	SI-7306 21 SI Pump Discharge Line Drain Stop PAB 59' SI Pump Cell	11	Open				Closed			

Answer Key

12	Danger	SI-4274-Cap Cap Downstream of vent valve 4274 PAB 59' SI Pump Cell	12	Cap Removed				Installed			
13	Danger	SI-4274 21 SI Pump Casing Vent Stop PAB 59' SI Pump Cell	13	Open				Closed			

Answer Key

INITIATING CUES:

1 The eSOMS Clearance Module is unavailable.

2 The Shift Manager has determined that 21 Safety Injection Pump must be tagged out for seal replacement.

3 Clearance Number is 2C20

4 Tagout Number is SI-001.

5 You are directed to prepare a manual tagout for 21 Safety Injection Pump using EN-OP-102 and EN-OP-102-01.

TASK STANDARD:

Manual Tagout Complete and ready for review.

Calculate a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

Calculate a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to calculate a radioactive liquid release in accordance with SOP-5.1.5

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. The Unit is operating at 100% power.

2. All radiation monitors are operable.

3. Waste Distillate Storage Tank #14 is to be discharged, tank level, as reported by the NPO, is 71 inches.

4. WDST has been isolated and on recirc for the past 5 hours.

5. R-54 is aligned to #14 WDST.

6. You are directed to calculate the Radioactive Liquid Release & Prepare the Post ~~Release Permit~~ Permit in accordance with 2-SOP-5.1.5. and submit to CRS for review

8. Additional Data:

Permit Number	100300
Tank ID	14 WDST
Initial Tank Level	71
Pre-release volume	16,351 gal
Recirculation Rate	150 gpm
Recirc Start-	Today 5 hours ago
Recirc Stop	Today Now
Chem Sample Number	3906
Sample Date/Time	Today 15 minutes ago
Total Gamma Activity	4.0E-5 uci/ml
ADC	5.31E-7 uci/ml
ppm Boron in tank	632
Pump Configuration	6 CWPs in Fast, 3 SWPs, 0 RWPs

Instructor Cue

TASK STANDARD:

Radioactive liquid waste release calculation and release permit (Attachment 1 to SOP-5.1.5) complete.

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation **Time Commenced: _____**		
2.	Review Precautions and Limitations CUE: When requested, inform operator all P&Ls are satisfied	Precautions and Limitations Reviewed	
3.	Determine required recirculation time for the tank to be released	Determine minimum recirculation time to be 218 minutes from Table 1	
✹4.	Determine Total Dilution Flow CUE: 6 CWP Fast Speed 3 SWP 0 RWP	Sum flowrate based on current pump combinations. Calculate 855,000 gpm	
5.	Assign Permit Number **CUE:** Permit Number 100300	Initial Conditions	

Calculate a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
6.	Enter data on Attachment 1 CUE: Permit Number 100300 Tank ID 14 WDST Initial Tank Level 71 Pre-release volume 16,351 Recirculation Rate 150 gpm Recirc Start- Today 5 hours ago Recirc Stop Today Now Chem Sample Number 3906 Sample Date/Time Today 15 minutes ago Total Gamma Activity 4.0E-5 ADC 5.31E-7 ppm Boron in tank 632	Supplied with Initial condition.	
7.	Verify from Chemistry total gamma activity without noble gas is less than 5.0E-5 µCi/ml. CUE: Chemist reports total gamma activity < 5.0E-5 µCi/ml. If requested, R54 activity is 2.4E-5µCi/cc	Simulate Contact Chemist	
8.	Record Available Dilution Flowrate	Previously calculated 855,000 gpm	
●9.	Calculate pounds of Boron in Tank and Maximum Allowable Chemical Release Rate	Performs calculation determines 86 (±1) pounds of boron and Chem release rate 1352 (±2)	
●10.	Calculate the Permissible Radioactive Release Rate	Performs calculation determines rad. Release rate 11350 (±5)	
11.	Determine most restrictive release rate	Identifies Pump Capacity 250 most restrictive	

Calculate a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
12.	Determine effluent rad monitor in service and calculate maximum alarm	Calculates Max Alarm Setpoint 1.816E-3	
13.	Select an Alarm setpoint less than or equal to the calculated setpoint and record	Records a value less than the calculated value	
14.	Set the alarm setpoint per 2-SOP-12.3.2 CUE: If asked another operator will adjust the radiation monitor setpoint		
15	Select an Warn setpoint less than or equal to the Alarm setpoint and record	Records a value less than the Alarm value	
13.	Submit completed permit to CRS for review		
	JPM Complete		

Calculate a Liquid Radioactive Release Permit for #14 Liquid Waste Distillate Storage Tank

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

ANSWER KEY
EXAMPLE RADIOACTIVE LIQUID RELEASE PERMIT
(Page 1 of 1)

PERMIT # 10300 TANK ID 14 WDST INITIAL Tank Level: 71 (Inches) 16351 Volume (V), gal

RECIRC RATE: 150 gpm

Recirc Start: 7/14/10 (Date) 00:00 (Time)

Recirc Stop: 7/14/10 (Date) 05:00 (Time)

Chemistry Sample No. 3906 Sample Collection: 7/14/10 (Date) 04:30 (Time)

Gamma Activity without Gas and Tritium is less than the admin limit of SMM-CY-001: **Yes** / No

Total Gamma Activity **4.0E-5** µCi/ml Allowed Diluted Concentration (ADC) **5.31E-7** µCi/ml

TOTAL DILUTION FLOW (T) **855,000** (GPM) From: 6 Unit 2 Circulators, 0 Unit 3 Circulators, 3 Service Water Pumps

BORON: 632 (ppm B) x 16351 (tank vol (V), gal) x 8.33E-6 = **86** pounds

Maximum Chemical Release Rate (Rc) = (**855,000** (Avail Dil Flow (B), gpm) x 1 ppm) ÷ 632 (ppm B) = **1352** gpm

Radioactive Release Rate: (Rr) = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **4.0E-5** (Gamma Act (C), uCi/ml) = **11350** gpm

Most Restrictive Release Rate (R) = **250** gpm (pump capacity most limiting)

Rad Monitor # **54** SOURCE CHECKED **X** OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATT 3)

Maximum Alarm Setpoint = (**855,000** (Avail Dil Flow (B), gpm) x **5.31E-7** (ADC, uCi/ml)) ÷ **250** (Most Restrictive Release Rate (R), gpm) = **1.816E-3** uCi/ml

Actual Alarm Setpoint = **4.0E-4** uCi/ml Warn Setpoint = **3.0E-4** uCi/ml

DISCHARGE FLOW METER & RECORDER OPERABLE **X** YES ____ NO (IF NO, COMPLETE ATTACHMENT 3)

Release Authorized By: _____ _____ _____ (Date)

RELEASE INITIATED: _____ (Date) _____ (Time)

RELEASE TERMINATED: _____ (Date) _____ (Time)

FINAL TK LEVEL: _____ (Inches) _____ gal TOTAL VOLUME RELEASED _____ gal

Remarks:

Move to last page after year off sheet

ATTACHMENT 1
EXAMPLE RADIOACTIVE LIQUID RELEASE PERMIT
(Page 1 of 1)

PERMIT #_____ TANK ID _____ INITIAL Tank Level:___ (Inches) _____ Volume (V), gal

RECIRC RATE : _____ gpm

Recirc Start: _____ (Date) _____(Time)

Recirc Stop: _____ (Date) _____(Time)

Chemistry Sample No. _____ Sample Collection : _____ (Date) _____(Time)

Gamma Activity without Gas and Tritium is less than the admin limit of SMM-CY-001: **Yes** / No

Total Gamma Activity _____µCi/ml Allowed Diluted Concentration (ADC) _____µCi/ml

TOTAL DILUTION FLOW (T) _____(GPM) From: _____ Unit 2 Circulators _____ Unit 3 Circulators _____ Service Water Pumps

BORON: _____ (ppm B) x _____ (tank vol (V), gal) x 8.33E-6 = _____pounds

Maximum Chemical Release Rate (Rc) = (_____ (Avail Dil Flow (B), gpm) x 1 ppm) ÷ _____ (ppm B) = _____ gpm

Radioactive Release Rate: (Rr) = (_____ (Avail Dil Flow (B), gpm) x _____ (ADC, uCi/ml)) ÷ _____ (Gamma Act (C), uCi/ml) = _____ gpm

Most Restrictive Release Rate (R) = _____ gpm (pump capacity most limiting)

Rad Monitor # _____ SOURCE CHECKED _____ OPERABLE ___YES ____ NO (IF NO, COMPLETE ATT 3)

Maximum Alarm Setpoint = (_____ (Avail Dil Flow (B), gpm) x _____ (ADC, uCi/ml)) ÷ _____ (Most Restrictive Release Rate (R), gpm) = _____uCi/ml

Actual Alarm Setpoint = _____ uCi/ml Warn Setpoint = _____ uCi/ml

DISCHARGE FLOW METER & RECORDER OPERABLE ____YES ____ NO (IF NO, COMPLETE ATTACHMENT 3)

Release Authorized By: _____ _____ (Date)

RELEASE INITIATED: _____(Date) _____ (Time)

RELEASE TERMINATED: _____(Date) _____ (Time)

FINAL TK LEVEL: _____ (Inches) _____gal TOTAL VOLUME RELEASED _____gal

Remarks:

INITIATING CUES:

1. The Unit is operating at 100% power.
2. All radiation monitors are operable.
3. Waste Distillate Storage Tank #14 is to be discharged, tank level, as reported by the NPO, is 71 inches.
4. WDST has been isolated and on recirc for the past 5 hours.
5. R-54 is aligned to #14 WDST.
6. You are directed to calculate the Liquid Release Permit in accordance with 2-SOP-5.1.5. and submit to CRS for review
7. Additional Data:

Permit Number	100300
Tank ID	14 WDST
Initial Tank Level	71
Pre-release volume	16,351
Recirculation Rate	150 gpm
Recirc Start-	Today 5 hours ago
Recirc Stop	Today Now
Chem Sample Number	3906
Sample Date/Time	Today 15 minutes ago
Total Gamma Activity	4.0E-5
ADC	5.31E-7
ppm Boron in tank	632
Pump Configuration	6 CWPs in Fast, 3 SWPs, 0 RWPs

TASK STANDARD:

Radioactive liquid waste release calculation and release permit (Attachment 1 to SOP-5.1.5) complete.

Facility: Indian Point Unit 2 Date of Examination: July 12, 2010

Exam Level: RO X SRO-I ☒ SRO-U ☐ Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)			
	System / JPM Title	Type Code*	Safety Function
a.	Realign a Misaligned Rod	M, A, S	1
b.	Terminate Safety Injection after Main Steam Line Break	N, S, EN	2
c.	Depressurize the RCS during SGTR using Aux Spray	D, A, S, EN	3
d.	Transfer from AFW to Low Flow Bypass Feed.	M, L, P, S	4-S
e.	Align Recirculation Spray	N, S, EN	5
f.	Restore Power to Bus 2A using 22 EDG RO ONLY	A, N, S	6
g.	Perform Required Actions for 23 SG Pressure Channel (439B) Failing Low	D, A, S	7
h.	Adjust the Alarm setpoints for R-44 in preparation for a gaseous release	N, S	9
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
i.	Perform Required Actions to Dump Steam Locally Using the Atmospheric Steam Dump Valve for 21 SG	D, A, E	4-P
j.	Start the Appendix R SBO EDG	N	6
k.	Perform the Required Actions to Establish Backup Cooling to the Charging Pumps	D, R, E	8

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U

a. **Realign a Misaligned Control Bank Rod** in accordance with 2-AOP-ROD-1, *Rod Control Malfunctions*. One Control Bank Rod has become misaligned during power ascension with power level approximately 50%. When the candidate releases the IN-HOLD-OUT switch, the control rod will continue to withdraw. The candidate should re-enter 2-AOP-ROD-1, trip the reactor and perform the Immediate Operator Actions for a Reactor Trip.
- This is an Alternate Path JPM.
- This is a Modified Bank JPM
- Failure to properly perform this task will result in violation of TS and possible exceeding hot channel factors.

b. **Terminate Safety Injection after Main Steam Line Break**. The plant experienced a steam break outside containment upstream of the MSIVs. Following the isolation of the faulted SG, the crew would transition to E-1; then, the crew would transition to ES-1.1, *SI Termination* using the foldout page criteria. This procedure flowpath does not have SI, or Phase A reset prior to entry. The candidate will be required to perform all actions to Reset SI and Phase A signals, then Terminate SI by securing the pumps.
- This is a new JPM.
- Failure to properly perform this JPM will result in SI flow continuing and possible PTS condition.

c. **Depressurize the RCS during a SGTR using Aux Spray**. A SGTR of adequate size to cause an SI has occurred. 6.9 KV Bus 3 tripped on fault resulting in a loss of 23 RCP. All actions up to depressurize to refill the pressurizer and minimize break flow will have been completed. The PORV Block Valves will be danger tagged shut and PCV-455A (Loop 24 Spray Valve) will not open. The candidate will continue in 2-E-3, *Steam Generator Tube Rupture* and perform depressurization using Aux Spray.
- This is an Alternate Path JPM.
- This JPM directly from the JPM bank; however, it has not been used on the previous 2 NRC Exams.
- Failure to properly perform this task will result in excessive loss of RCS inventory and possible SG overfill.

d. **Transfer from AFW to Low Flow Bypass Feed**. The plant is at approximately 2-3% power. One MBFP has been started and is ready to provide flow to the SGs. In accordance with 2-SOP-21.1, *Main Feedwater System,* the candidate will transfer steam generator feedwater from the Auxiliary Feedwater System to the Main Feedwater Low Flow Bypass valves.
- A similar JPM was used on the last Unit 3 exam; however the method used was different from the method used in this JPM.
- Failure to properly perform this task will result in possible reactor trip on SG level.

e. **Align Recirculation Spray Flow**. The plant has experienced a Large Break LOCA. Transfer to recirculation has been accomplished. When the RWST has decreased to 2 feet the operating Containment Spray pump must be secured and transfer to recirculation spray flow must be accomplished in accordance with 2-ES-1.3 *Transfer to Cold Leg Recirculation*. This JPM requires the candidate to ensure proper core flow while Recirculation Spray flow is established since the Recirculation Pumps will be providing both core cooling flow and containment spray flow.
- This is a new JPM.
- Failure to properly perform this task will result in failure to meet FSAR assumptions for Iodine removal.

f. **Restore power to bus 2A using 22 EDG**. Bus 2A normal supply breaker will be tripped on overcurrent. The candidate will use 2-SOP-480V-1, *Loss Of Normal Power To Any 480v Bus.* All 3 EDGs will have automatically started and be running unloaded. All of the loads on the bus will be removed and a visual inspection of the bus performed (Local action). The bus will be re-energized from the control room using the EDG supply breaker.

- This is a New JPM.
- This is an Alternate path JPM.
- Failure to properly perform this task will result in reduction in redundant power supplies for safeguards equipment.

g. **Perform Required Actions for 23 SG Pressure Channel (439B) Failing Low (alternate Path)**. The affected Steam Pressure Transmitter provides density compensation for the steam flow channel used in the Steam Generator Water Level Control System. Steam Pressure failing Low will result in Steam Flow failing Low. The Immediate Operator actions will attempt to place the unaffected steam flow transmitter in service. The switch will not function (stuck contacts) requiring the candidate to take manual control of the feedwater regulating valve and controlling level. Additional actions include tripping bistables to remove the channel from service.

- This is a Bank JPM.
- This JPM has never been used on an ILO NRC exam.
- This is an Alternate path JPM.
- Failure to properly perform this task will result in loss of control of SG level and possible Reactor Trip.

h. **Adjust the Alarm setpoints for R-44 in preparation for a gaseous release**. In preparation for a gaseous waste release, the Warn and Alarm setpoint for Radiation Monitor 44, *Plant Vent Radio Gas*, must be changed. A Gaseous Waste Release Permit calculation indicates that the Alarm and Warn setpoint must be reset prior to the actual release. The candidate must change the Alarm and Warn setpoint to the values calculated on the Release Permit.

- This is a New JPM.
- Failure to properly perform this task may result in excessive release of radioactive gas to the environment.

i. **Perform Required Actions to Dump Steam Locally Using the Atmospheric Steam Dump Valve for 21 SG.** The JPM is part of the Appendix R actions. Instrument Air will not be available for the Atmospheric Steam Dump Valve. The candidate will be required to simulate connecting the alternate Nitrogen supply tank to the valve and control steam flow locally.

- In Plant JPM
- This is a Bank JPM.
- This JPM has not been used at Unit 2 for initial NRC exams. The Nitrogen Bottles were recently added and this JPM was written for annual requal operating exam.
- Failure to properly perform this task will result in inability to control RCS temperature during a control room evacuation.

j. **Start the Appendix R Emergency Diesel Generator**. Using 2-SOP-27.6, *Unit 2 Appendix R Diesel Generator Operation,* Start the Appendix R EDG Normal Engine Start (Parallel Mode).This is a relatively new piece of equipment. This EDG was not installed during the last NRC exam.

- In Plant JPM
- This is a New JPM.
- Failure to properly perform this task will result in not supplying electrical power during control room evacuation event.

k. **Perform the Required Actions to Establish Backup Cooling to the Charging Pumps** – This JPM is part of the Appendix R actions. The control room is evacuated and CCW is not available to the charging pumps. The candidate is directed to align backup city water cooling to the charging pumps.

- In Plant JPM
- This JPM is directly from existing bank.
- This JPM has not been used on the previous last 2 Unit 2 Initial NRC examinations. A similar JPM was used on the last Unit 3 Initial exam; however, the methodology is significantly different between units.
- Failure to properly perform this task will result in inability to maintain RCS inventory and possible core damage.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to realign misaligned rod P-6.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

The plant is at approximately 60% power during a startup. During rod withdrawal rod P-6 stepped in then stopped when the IN-HOLD-OUT switch was released. I&C identified a Moveable Gripper fuse blown. The fuse has been replaced.

The OM and Reactor Engineering have determined the rod should be realigned with the bank.

All necessary Briefs have been completed.

The Reactor Engineer has determined that the rod can be restored at normal rod speed.

You are directed to realign Rod P-6 with the bank in accordance with 2-AOP-ROD-1 starting with step 106.

TASK STANDARD:

Control Bank D rod P-6 is realigned with the remainder of the bank.

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain procedure 2-AOP-ROD-1		
3.	Will rod be realigned with the group CUE: The rod will be aligned with the group.		
4.	Is the affected rod below remainder of rods in its group?	Observes rod below remainder of rods	
5.	Observes CAUTION before step 4.108 CUE: Reactor Engineer determined there are no limits on power and rod can be withdrawn at normal manual rod speed.	Contact Reactor Engineer for limitations	
✹6.	Open lift coil disconnect switches for all rods in Control bank D except rod P-6.	All lift coil disconnect switches opened	
✹7.	Place rod bank selector switch in CBD (Control Bank D) position	Selector Switch in CBD	
8.	Record group step counter reading for affected rod group	Records rod group position (approximately 194 steps)	
9.	Manually set step counter for group containing affected rod to actual position of misaligned rod **CUE: Rod is at 161 Steps**	Adjust step counter reading to affected rod height.	
10.	Is affected rod in a control bank	Determines P-6 is in CBD	
11.	Place P/A converter display selector switch in position for appropriate bank and record position	Select CBD on P/A converter and record position	
12.	Is affected rod below remainder of rods in its group	Determines rod is below remainder of rods	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
13.	Is alarm NIS Power Range Overpower Rod Stop 106% clear?	Determines alarm is clear	
14.	Observe NOTE before step 4.118	Observes note	
*15.	Withdraw affected rod at rate specified by Reactor Engineer (Normal manual rod speed) until group step counter matches that recorded above. NOTE: Candidate may release IN_HOLD OUT switch when Urgent Failure Alarm annunciates.	Places IN-HOLD-OUT switch to OUT position	
*16.	Observes rod continue to move when IN-HOLD-OUT switch is released.	Step counters continue and IRPI continues to increase	
17.	Candidate may trip the reactor at this time or may re-enter the procedure (steps below)		
18.	Was this procedure entered due to continuous unwarranted rod motion?	Determines procedure was entered due to continuous rod motion	
19.	Is rod control in manual	Determines rod control is in manual	
20	Does continuous unwarranted rod motion still exist	Determines rod motion still exists	
*20.	Trip the reactor and GO TO E-0	Depresses Reactor Trip Pushbutton	
21.	Enter E-0	Removes placard for Immediate Operator Actions	
22	Verify Reactor Trip Observes: Reactor Trip Breakers Open Neutron flux lowering Rod bottom light lit Rod Position Indicators all < 2.5 inches	Observes the reactor is tripped	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
23.	Verify Turbine Tripped Observes all stop valves closed	Observes turbine is tripped	
24.	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Reset Simulator to IC-18

Enter Malfunction **MAL CRF002AV** (Dropped Rod), **Moving** (for moveable gripper).

Place Rod Control Mode Selector Switch in manual if necessary.

Insert rods one and withdraw one step to cause P-6 to become misaligned.

REMOVE malfunction MAL CRF002AV

Insert Malfunction **MAL CRF004A** (Uncontrolled Rod Motion Bank or Man) set STEP/MIN to **66.**

Take Snapshot if JPM is to be used more than once.

INITIATING CUES:

The plant is at approximately 60% power during a startup. During rod withdrawal rod P-6 stepped in then stopped when the IN-HOLD-OUT switch was released. I&C identified a Moveable Gripper fuse blown. The fuse has been replaced.

The OM and Reactor Engineering have determined the rod should be realigned with the bank.

All necessary Briefs have been completed.

The Reactor Engineer has determined that the rod can be restored at normal rod speed.

You are directed to realign Rod P-6 with the bank in accordance with 2-AOP-ROD-1 starting with step 106.

TASK STANDARD:

Control Bank D rod P-6 is realigned with the remainder of the bank.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to Terminate Safety Injection in accordance with 2-ES-1.1

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

A large steam break occurred outside the VC upstream of the MSIV on 24 SG.

All actions of E-0 including Attachment 1 and E-2 have been completed. The crew transitioned to E-1 and determined that the Foldout Page SI Termination criteria was satisfied and transitioned to 2-ES-1.1.

You are directed to Terminate SI in accordance with 2-ES-1.1

TASK STANDARD:

SI is terminated in accordance with ES-1.1 up to and including step 6.

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain correct procedure	ES-1.1	
3.	Review CAUTION before step 1	Reviews CAUTION	
4.	Reset SI	See Below	
	Check All CCW Pumps Running	Observes all CCW pumps running	
	Place Controls for Main and Bypass Feed Reg Valves to close	Place MFRV in Manual and lower setpoint to 0 Check Bypass FRV in close	
■	Verify Automatic Safeguards Actuation key switches on Panel SB-2 in Defeat	Train A & Train B Key Switches placed in Defeat	
■	One at a time depress SI Reset buttons	Reset Buttons depressed one at a time	
	Verify Train A & Train B Reset Note: The audible click of the relays resetting is acceptable. Candidate may go to the relays to visually observe them reset.	Audible Click heard when buttons depress	
5.	Reset Containment Isolation Phase A and B	See Below	
■	Place IVSW switches to Open	Places switches to open for: 1410 1413 SOV-3518 SOV-3519	
■	Place Containment Rad Mon WCPS Valves to OPEN	Switch to open	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Note: One Switch controls 4 Valves		
	Verify personnel and equipment hatch solenoid control switches to INCIDENT	Switches verified in incident	
■	Place control switches for all remaining Phase A isolation valves to CLOSE	Switches placed to close	
■	One at a time depress Phase A reset buttons Note: The audible click of the relays resetting is acceptable. Candidate may go to the relays to visually observe them reset.	Reset Buttons depressed one at a time	
	Verify Train A and B reset	Audible Click heard when buttons depress	
	Check Phase B actuated NO	Observes Phase B not actuated	
■6.	Establish Instrument Air to containment – Open PCV-1228	Switch for 1228 to Open	
7.	Stop SI Pumps and Place in Auto	See Below	
■	Stop SI Pumps and place in Auto	All 3 Switches to stop and returned to auto	
	Check any RHR Pumps running with suction aligned to RWST	Observes one RHR pump running aligned to RWST	
■	Stop RHR pumps and place in Auto	Switch to stop and both switches returned to Auto	
8.	Review Caution and Note before step 5	Caution and Note reviewed	
9.	Check if charging flow has been established – YES	Observes one charging pump running	
10.	Establish charging flow as necessary NOTE: Candidate may reduce charging flow and adjust HVC-142 to maintain seal in jection	Adjust as necessary No adjustment is acceptable	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
11.	Verify SI Flow Not Required	Check Subcooling > 19°and Pressurizer Level > 14%	
	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Initialize to any 100% power IC

Insert Malfunction MAL-SGN003D at 100%. Run the simulator and allow alarms to annunciate and automatic actions to occur.

Perform required actions of E-0 including attachment 1, and E-2.

Freeze the simulator. Take a snapshot if JPM is to be used more than once.

INITIATING CUES:

A large steam break occurred outside the VC upstream of the MSIV on 24 SG.

All actions of E-0 including Attachment 1 and E-2 have been completed. The crew transitioned to E-1 and determined that the Foldout Page SI Termination criteria was satisfied and transitioned to 2-ES-1.1.

You are directed to Terminate SI in accordance with 2-ES-1.1

TASK STANDARD:

SI is terminated in accordance with ES-1.1 up to and including step 6.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to depressurize the RCS to restore inventory during a SGTR.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. PORV Block Valve 535 is Stop Tagged due to inoperable motor.
2. A Steam Generator Tube Rupture occurred 20 minutes ago
3. All actions of E-0 and E-3 have been completed up to and including the RCS cooldown.
4. Ruptured SG pressure has been verified increasing with adequate RCS Subcooling
5. Bus 6 is tripped on a fault at the completion of the cooldown.
6. All necessary safeguards equipment was restarted after bus fault.
7. The CRS has directed you to depressurize the RCS in accordance with E-3 commencing with step16.

TASK STANDARD:

The RCS has been depressurized to meet the requirements of E-3.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Procedure	E-3	
3.	Check subcooling > 39°F	Observe Saturation Monitors Subcooling SAT	
4.	Check normal spray available	Identifies normal spray is available;	
5.	Spray Pressurizer with Maximum Spray	Identifies Spray Valve does not open Transitions to Step 18	
6.	Observe Note before Step 18	Observes the NOTE	
7.	Check at least one PORV available	Determines PORV available	
8.	Open one PORV	Determines PORV does not open	
	ESTABLISH AUX SPRAY		
9.	Maintain RCP Seal Injection 6 – 12 gpm	Observe Seal Injection flow meters	
10.	Secure all but one charging pump and reduce speed to minimum	Observes two charging pumps running; secures one pump and reduces speed to minimum	
●11	Close charging line flow control valve HCV-142	Adjusts potentiometer to 0% output	
●12.	Close charging stop valves 204A and 205B	Place switch for 204A to Close (204B should is closed)	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
13.	Close the Pressurizer Spray Valves	May Place PCV-455A controller to close	
●14.	Open Aux Spray Valve 212	Place switch for 212 to Open	
●15.	Initiate Aux Spray by slowly opening HCV-142	Rotate potentiometer to open valve	
16.	Adjust charging pump speed to increase spray flow	Adjust potentiometer for operating charging pump	
17.	Verify Aux Spray is established and return to step 17b	Verify pressure decreasing	
●18.	Secure depressurization when criteria met RCS Pressure < Ruptured SG pressure AND PRZR level > 14% OR PRZR level > 71% OR Subcooling < value in table for current RCS pressure	Close Aux Spray valve 212	
	Cue candidate that JPM is complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Initialize Simulator to any 100% power IC.

MAL-RCS014A at 3.5 will cause a SGTR of approximately 200 gpm in 21 SG

Allow approximately 1 minute for alarms to annunciate. Trip the reactor and perform the actions of E-0 (including Attachment 1)

Perform actions of E-3 up to and including step 15.

After Cooldown insert Malfunction MAL EPS006F (Fault on Bus 6)

Insert Malfunctions SWI PCS044E OFF (Blown fuse in controller for PCV-455A)

The above malfunction must be re-entered after each IC reset

Insert Malfunction SWI-RCS006A CLOSE POS Pressurizer Relief Valve PCV-456 Control Switch

Place Red Hold Tag on Pressurizer Block Valve 535 in Close Pull to Lock Close position.

Freeze simulator.

Take a snapshot if JPM is to be used more than once.

INITIATING CUES:

1. PORV Block Valve 535 is Stop Tagged due to inoperable motor.

2. A Steam Generator Tube Rupture occurred 20 minutes ago

3. All actions of E-0 and E-3 have been completed up to and including the RCS cooldown.

4. Ruptured SG pressure has been verified increasing with adequate RCS Subcooling

5. Bus 6 is tripped on a fault at the completion of the cooldown.

6. All necessary safeguards equipment was restarted after bus fault.

7. The CRS has directed you to depressurize the RCS in accordance with E-3 commencing with step16.

TASK STANDARD:

The RCS has been depressurized to meet the requirements of E-3.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to transfer feedwater from Aux Feed to the Low Flow Bypass Feed Regulating Valves.

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

The unit is approximately 3% power with a normal startup in progress. 21 MBFP is running. Feed flow to the SGs is being supplied by the AFW system. All chemistry parameters are in specification. The CRS is in POP-1.3 at step 4.22.4 and had directed you Transfer from AFW feed to Low Flow Bypass Feed using 2-SOP-21.1 section 4.1.9.

All requirements for entering MODE 1 have been met.

TASK STANDARD:

Feed flow is being supplied by the low flow bypass valves and AFW system has been shutdown and restored to auto-standby operation.

✹ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Procedure 2-SOP-21.1	Obtains procedure	
3.	Place HI/LO Steam Flow and Feedwater Flow Chart Scale to LO mode	Ensures switches are in LO	
4.	Adjust MBFP Speed so its discharge pressure is 50 – 100 psig LESS than SG pressure	Adjust 21 MBFP Foxboro Controller to achieve desired ΔP	
✹5.	Open all four feedwater bypass valves to 50%	Rotate LFBV potentiometers to 50%	
✹6.	Slowly raise MBFP speed to raise discharge pressure to just above SG pressure and establish flow	Adjust 21 MBFP Foxboro controller to achieve desired ΔP	
✹7.	When increase in SG level or feedwater flow is observed, throttle AFW flow	Move manual switch (Left-Right) to adjust AFW flow	
8.	When all 4 Aux Feed Reg Valves are fully closed, Shutdown the AFW system CUE: A spare operator will shutdown the AFW system	No Action necessary	
✹9.	Maintain SG levels 35 – 60% using LFBV setpoint dials.	Adjust Setpoint dials as necessary	
	JPM is Complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Select IC with Power approximately 3 – 6%.
Ensure MBFP is running. Adjust discharge pressure to approximately 150 or more LESS than SG pressure. Ensure LFBVs closed and AFW supplying SGs Stabilize SG Level

Take a snapshot if JPM is to be used more than once.

INITIATING CUES:

The unit is approximately 3% power with a normal startup in progress. 21 MBFP is running. Feed flow to the SGs is being supplied by the AFW system. All chemistry parameters are in specification. The CRS is in POP-1.3 at step 4.22.4 and had directed you Transfer from AFW feed to Low Flow Bypass Feed using 2-SOP-21.1 section 4.1.9.

TASK STANDARD:

Feed flow is being supplied by the low flow bypass valves and AFW system has been shutdown and restored to auto-standby operation.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to Align Containment Spray for Recirculation Beginning at step 21 of 2-ES-1.3

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. A large break LOCA has occurred.

2. Safety Injection and Containment Spray have been RESET in accordance with E-1, Loss of Reactor or Secondary coolant.

3. The RWST level has decreased to 2 feet and the CRS has directed you to transfer to Containment Spray recirculation in accordance with ES-1.3

4. All steps up through and including step 18 of E-1 have been completed.

5. The Service Water System is aligned for two header operation.

6. You are directed to align Containment Spray for Recirculation Spray Flow

TASK STANDARD:

Containment Spray is aligned for Recirculation.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Procedure	2-ES-1.3	
3.	Check any Containment Spray pumps running	Observe 22 Spray Pump Running	
4.	Check RWST level LESS THAN 2 feet	Observe RWST level approximately 2 feet	
●5.	Stop Containment Spray Pumps	Place control switch to stop	
●6.	Close Containment Spray Pump Discharge Valves	Place Switches for MOV 866A-D in close	
7.	Determine 21 RHR Heat Exchanger is in service	Observes valve alignment for 21 RHR HX	
●8.	Open Spray Header Valve for In Service RHR heat exchanger	Place switch for 899B to Open	
9.	Check Minimum Flow to core and containment spray	Observe indicators 946A-D	
	Candidate observes indicator 946D is reading 0 and uses Right Column and 2nd row.	Use table in ES-1.3 to verify adequate core flow	
	Check Minimum Spray flow > 960 gpm	Candidate observes recirc spray flow approximately 1800 gpm	
	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐

_____
Examinee Signature

All areas of observed weakness discussed

_____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Initialize to any 100% power IC.

Insert Malfunction MAL-RCS005A (B, C, or D)

Insert Override IND-RHR004 FI-946D Meter Signal Loop 1 "0 gpm"

Perform actions of E-0 up to step 15 including Attachment 1.

Perform actions of E-1 up to step 18.

Perform actions of ES-1.3 up to and including step 20.

Take a snapshot if JPM is to be used more than once.

INITIATING CUES:

6. A large break LOCA has occurred.

7. Safety Injection and Containment Spray have been RESET in accordance with E-1, Loss of Reactor or Secondary coolant.

8. The RWST level has decreased to 2 feet and the CRS has directed you to transfer to Containment Spray recirculation in accordance with ES-1.3

9. All steps up through and including step 18 of E-1 have been completed.

10. The Service Water System is aligned for two header operation.

TASK STANDARD:

Containment Spray is aligned for Recirculation.

RO only

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to restore power to bus 2A using 22 EDG

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

The plant is operating at 100% power.

Bus 2A normal feed breaker tripped open on overcurrent.

All actions of 2-AOP-480V-1, Loss of Normal Power to Any 480V bus have been completed up to Attachment 2 step 2.1.

The CRS has directed you to restore power to bus 2A using 2-AOP-480V-1 Attachment 2.

TASK STANDARD:

Bus 2A is Re-energized from 22 EDG.

INITIATING Cue:

■ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation. **Time Commenced: _____**		
2.	Obtain procedure	AOP-480V-1	
3.	Is bus 2A energized by 22 EDG	Determines bus 2A is not energized	
4.	Is 22 EDG running YES	Observes EDGs all running	
5.	Is white supervisory light for relay 86/2A extinguished	Determines light is extinguished	
6.	Dispatch an operator to open breakers for: MCC21 MCC23 MCC24/24A MCC28 MCC210 and Perform visual inspection of 2A CUE: Inform candidate that all breakers are opened	Contacts NPO and directs opening breakers	
■7.	Place control switches for 480V bus 2A in TPO 22 SIP 23 FCU 22 CCW Pump 22 SW Pump 25 SW Pump 22 BU Heaters	Places all control switches in TPO	
	CUE: NPO reports visual inspection of bus 2A reveal no observable damage and no smoke or unusual smell.		

TPO spell out ? Trip position ?

goes with Step #8 move

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
8.	Is there any other indication of damage on bus 2A?	Determines no other damage to bus 2A	
9.	Green flag BKR 52 EG-2A Note: Breaker will be green flagged	Observes breaker switch green flagged	
●10.	Green flag breaker 52-2A	Places BKR control switch to trip and back to auto	
●11.	Reset 480V Bus 2A lockout relay	Depress reset pushbutton observe white supervisory light for relay 86/2A illuminated	
●12.	Place 480V bus 2A BKR EDG-2A in close and release	Switch in close and released to auto	
13.	Is bus 2A energized Yes	Observes bus 2A is energized	
	JPM is Complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

Simulator Setup

Insert malfunction EPS007A 480V Bus 2A Fault.

Run Simulator.

Perform actions in 2-AOP-480V-1 up to step 2.1 of Attachment 2.

Remove Malfunction EPS007A 480V Bus 2A Fault.

Take a snapshot if JPM is to be used more than once.

INITIA~~TING~~ al Conditions CUES:

The plant is operating at 100% power.

Bus 2A normal feed breaker tripped open on overcurrent.

All actions of 2-AOP-480V-1, Loss of Normal Power to Any 480V bus have been completed up to Attachment 2 step 2.1.

The CRS has directed you to restore power to bus 2A using 2-AOP-480V-1 Attachment 2.

TASK STANDARD:

Bus 2A is Re-energized from 22 EDG.

Initiating Cue:

File:
Task Number:

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to take the appropriate actions to stabilize the plant in response to indications and annunciators.

I will describe the general system conditions. Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. Reactor at indicated power.
2. Steady State, equilibrium Xenon.
3. No equipment out of service.

TASK STANDARD:

Plant stabilized with appropriate failed equipment removed from service per the applicable procedure.

Denotes Critical Step

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	NOTE: Take simulator out of Freeze, initiate malfunction at direction of evaluator.		
	CUE: Evaluator, inform operator as the CRS to implement immediate actions of 2-AOP-INST-1, Instrument/Controller Failures		
1.	Operator takes Immediate Actions from memory **NOTE:** Immediate actions of 2-AOP-INST-1 **NOTE:** Placing Steam Flow selector switch to operable channel WILL NOT transfer control. Operator must take manually control of Feed Reg Valve and control SG Level. Manual control of SG level is Critical. **CUE:** Following Operator's implementation of Immediate Actions, as CRS, inform operator that an instrument failure has occurred and to implement 2-AOP-INST-1. **NOTE:** Candidate may take MBFP Speed control to manual due to failure of steam flow to transfer.	1. Checks parameters listed and determines that 23 S/G Pressure Channel (439B) is failed low. 2. Verify 23 S/G level control is affected 3. Select both SG transfer switches to non-affected channel 4. Take manual control of 23 Feed Reg Valve to control parameters and stabilize the plant. 5. Assures all control systems listed in step 3.1 are checked.	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
2.	Operator determines that an instrument failure has occurred	Operator identifies 23 S/G Steam Pressure Channel (439B)	
3.	Using table in 2-AOP-INST-1, operator transitions to the procedure step for Steam Pressure.	Operator identifies and transitions to procedure step for failed Steam Pressure Channel.	
4.	Check status of Channel C instrument.	Verify 23 Steam Pressure Channel C has not failed and transitions to step 4.47	
5.	Refer to appropriate Tech Spec as described in the AOP. **CUE:** Inform operator as CRS that the proper Tech Spec Tables have been referred to.	N/A	
NOTE	Review notes prior to step 4.48	Notes reviewed	
●6.	Verify placing Steam Line Pressure Comparison Bistable Trip Switches for the failed channel in trip will not cause a safety injection and trip the appropriate Bistable Trip Switches for the failed channel. **CUE:** Inform operator as CRS that ALL bistables associated with failed channel are to be tripped. A spare operator will maintain SG levels.	IAW Attachment 3 of 2-AOP-INST-1, Loop 1B Steam Line Comparison, P3<P1 and P1<P3, in White rack A-11 are placed in trip position.	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
NOTE	Review notes prior to step 4.49	Notes reviewed	
●X ✎	Verify placing Steam Flow Mismatch Bistable Trip Switch for the failed channel in trip will not cause a Rx Trip or Safety Injection and trip the appropriate Steam Flow Mismatch Bistable Trip Switch for the failed channel. **CUE:** Inform operator as CRS that ALL bistables associated with failed channel are to be tripped. A spare operator will maintain SG levels.	IAW Attachment 4 of 2-AOP-INST-1, Loop 3B SF>FWF in White rack A-11 is placed in trip position.	
8.	Return controls used to stabilize the plant to desired position **CUE:** If required, inform operator that failed channel will not be repaired at this time.	Determine that 23 Feed Reg Valve should remain in Manual	

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

SIMULATOR SET-UP

Any 100% Power IC

Insert Malfunction/Override

SWI-PCS077 B position Steam Flow Transfer Switch (failure to transfer)

Ensure 23 SG Steam Flow Channel B in Control

23 Steam Pressure Channel B Fails Low
Insert Malfunction:

XMT-SGN042A FIXED OUTPUT:
PT-439B S/G 23 PRESSURE CH 2
SEVERITY 0

Take Snapshot if JPM is to be used more than once.

INITIATING CUES:

1. Reactor at indicated power.
2. Steady State, equilibrium Xenon.
3. No equipment out of service.

TASK STANDARD:

Plant stabilized with appropriate failed equipment removed from service per the applicable procedure.

RETURN THIS TO INSTRUCTOR WHEN YOU HAVE COMPLETED

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to adjust the alarm setpoint for radiation monitor 44 in preparation for LGDT release

Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. Preparations are being made to release 23 LGDT.

2. The release permit has been prepared and requires R-44 alarm setpoint to be set at 9.00×10^{-3} µCi/cc

3. The CRS has directed you to reset R-44 Actual Alarm setpoint to 9.00×10^{-3} µCi/cc in accordance with 2-SOP-12.3.2, Digital Radiation Monitor System Operation (Local or SRD)

TASK STANDARD:

R-44 Alarm setpoint changed.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation **Time Commenced: _____**		
2.	Obtain correct procedure	Obtains 2-SOP-12.3.2	
3.	Review Precautions and Limitations	P&Ls reviewed	
●4.	Prepare SRD for data entry	Verifies remote light is lit at SRD Set Program mode key switch to ENTER DATA	
5.	Observe NOTE before step 4.9.1.2	Observes Note	
6.	Display the current setpoint: Press "CH" key Enter Channel Number "4" Press "FUNC" key Enter "0" Press "DISP" key	CH key depressed "4" entered for Channel Number FUNC key depressed "0" entered DISP key depressed	
7.	Observe Note before step 4.9.1.3	Observes Note	
●8.	Enter New Setpoint Press "CH" key Enter Channel Number "4" Press "FUNC" key Enter "0" Press "DATA" key Enter new value (three digits) without decimal point "900" Press the "EXP" key Press "DISP OP" key Enter exponent (two digits) "03" Press "ENTER" key	CH key depressed "4" entered for Channel Number FUNC key depressed "0" entered DATA key depressed 900entered for ssetpoint EXP key depressed DISP OP key depressed "03" Exponent	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
		entered ENTER key depressed	
●9.	Set program mode key switch to RUN position CUE: NPO reports all remaining local actions complete	Key switch to RUN	
10.	Inform CRS that R-44 Setpoint has been set to 9.00×10^{-3} µCi/cc CUE: CRS Acknowledges		
	JPM is Complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

SIMULATOR SETUP

Reset Simulator to any At Power IC

Ensure R-44 Setpoint is not 9.00×10^{-3} µCi/cc

INITIATING CUES:

1. Preparations are being made to release 23 LGDT.

2. The release permit has been prepared and requires R-44 alarm setpoint to be set at 9.00×10^{-3} µCi/cc

3. The CRS has directed you to reset R-44 Actual Alarm setpoint to 9.00×10^{-3} µCi/cc in accordance with 2-SOP-12.3.2, Digital Radiation Monitor System Operation (Local or SRD)

TASK STANDARD:

R-44 Alarm setpoint changed.

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to *simulate* locally dumping steam from 21 Steam Generator using the Atmospheric Steam Dump Valve

I will describe the general system conditions. Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. The CCR has been evacuated due to a fire and AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented.

2. The CRS has directed you to align the 21 Steam Generator Atmospheric Dump Valves PCV-1134 for local operation per 2-AOP-SSD-1, Attachment 3, commencing with step 3.8.

3. When directed by the CRS, you are to commence dumping steam from the Steam Generator using its atmospheric steam dump valve locally

4. Radio communications have been established.

TASK STANDARD:

Instrument Air isolated and Atmos Steam Dump Valve throttled open

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	NOTE: Remind operator to NOT change any switch or valve positions		
1	Obtains correct procedure and step	2-AOP-SSD-1, Attachment 3, Step 3.8	
2	Review Note prior to step 3.8	Note Reviewed	
●3	Close the normal Instrument Air supply stop from the positioner to the diaphragm, Valve F (V-1) **CUE:** After valve is located and simulated movement, cue that valve is CLOSED	Locates and indicates proper direction to CLOSE IA-1202 for PCV-1134	
4	Ensure the N2 pressure regulating valve H is backed out **CUE:** After valve is located and simulated movement, cue that valve is backed out	Locates and indicates proper direction to CLOSE PRV-5608 for PCV-1134	
●5	OPEN SGN-500 the N2 Inlet Stop valve C (V-4) **CUE:** After valve is located and simulated movement, cue that valve is OPEN	Locates and indicates proper direction to OPEN SGN-500 for PCV-1134	
●6	OPEN SGN-508 the N2 to the Diaphragm Stop valve D (V-2) **CUE:** After valve is located and simulated movement, cue that valve is OPENING	Locates valve and indicates proper direction to OPEN SGN-508 for PCV-1134	
7	CLOSE IA-1008 the vent valve E (V-3) **CUE:** After valve is located and simulated movement, cue that valve is CLOSED	Locates valve and indicates proper direction to CLOSE IA-1008 for PCV-1134	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	CUE: Inform operator, when each step (3.9, 3.10,& 3.11) is addressed for alignment, that 22, 23 and 24 SG Atmospheric Steam Dump Valves are aligned for steaming and operators are standing by at each of those stations for operation of those valves	Student advances to step 3.12	
8	Notify CRS and operator at ABFPs that Atmos Steam Dumps are manned and ready for steaming **CUE:** Acknowledge as CRS and ABFP operator	Inform CRS and ABFP operator that Atmos Stm dumps are manned and ready	
	CUE: Inform operator to commence steaming 21 SG per step 3.13		
*9	Throttle OPEN PRV-5608 Nitrogen Regulator valve H **NOTE:** Only provide the following cue if the above critical steps have been perform correctly. **CUE:** After indicator and valve is located and proper movement simulated, cue that steam can be heard from Atmos Dump **NOTE:** Only throttling of PRV-5608 is critical	Locates indicator and valve and indicates proper movement to throttle OPEN PRV-5608 for PCV-1134	

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIATING CUES:

3. The CCR has been evacuated due to a fire and AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented.

4. The CRS has directed you to align the 21 Steam Generator Atmospheric Dump Valves PCV-1134 for local operation per 2-AOP-SSD-1, Attachment 3, commencing with step 3.8.

3. When directed by the CRS, you are to commence dumping steam from the Steam Generator using its atmospheric steam dump valve locally

4. Radio communications have been established.

TASK STANDARD:

Instrument Air isolated and Atmos Steam Dump Valve throttled open.

RETURN THIS TO INSTRUCTOR WHEN YOU HAVE COMPLETED

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to perform a startup of the Unit 2 Appendix R Diesel Generator supplying Unit 2 Appendix R loads.

Before you start, I will state the ~~Task Standard~~ Initiating Conditions and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

~~INITIATING CUES~~: Initiating Conditions:

1. CCR has been evacuated due to a fire.

2. Normal Unit 2 Offsite power and EDGs are unavailable.

3. The 480V Switchgear room is inaccessible.

Initiating Cue:

~~4.~~ You are directed to Start the Unit 2 Appendix R Diesel Generator Supplying Appendix R Loads in accordance with 2-SOP-27.6 up to and including closing the SBO/ASS breaker.

TASK STANDARD:

The Appendix R Diesel Generator is running and breaker SBO/ASS is closed.

● **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
	Inform operator to BEGIN after his completion of review of the Initiating Cues and log time below		
1.	Commence evaluation		
2.	Obtain Correct Procedure and section	2-SOP-27.6 section 4.3	
3.	Observe NOTES before step 4.3.1	Reviews Notes	
4.	Initiate having District Operator Open Breaker F3-1 CUE: Breaker is Open	Simulates radio contact with SM	
5.	Request Unit 3 CCR to Open 52GT/2F CUE: 52GT/2F is Open	Simulates radio contact with Unit 3 CCR	
6.	Observe NOTES before step 4.3.3	Reviews Notes	
7.	Verify Delay Gate is closed	Verifies Gate Closed	
8.	Verify at least one of the following is open: Maintenance Loading Bay overhead door Tool Room Roll-up door	Observes Doors Open	
9.	Initiate Opening the 3 damper set directly west of Appendix R DG	Rotate the handwheel on the west wall	
10.	Verify the Appendix R diesel Generator Fuel Oil Day Tank indications are illuminated: System Ready Yellow LED Flashing Power Available Green LED Illuminated CUE Yellow LED is Flashing and Green LED is illuminated	Observes Yellow LED flashing and green LED illuminated	
11.	Check NO abnormal conditions exist as indicated by a LED flashin ON state and horn sounding. CUE NO LED is flashing and horn is silent	Observes App. R Day Tank Control Panel	

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
12.	Verify breaker SBOH is Open	Observes breaker is open	
13.	Verify breaker SBO/ASS is Open	Observes Breaker is Open	
●14.	Close Breaker ASS	Depress button on APP R Diesel Control Panel	
15.	Place Unit-Parallel switch to UNIT	Places switch to UNIT	
16.	Verify: Shutdown Status Indicator – Extinguished Warning Status Indicator - Extinguished	Observes indicators extinguished at Control Panel	
17.	If City Water will be the cooling source (YES)	See below	
●	Open UW-854, Backflow preventor inlet isolation	Simulates Opening Valve	
●	Open UW-855, Backflow Preventor Outlet Isolation	Simulates Opening Valve	
	Observe NOTE before step 4.3.11.2	Reviews NOTE	
●	Throttle UW-840 to achieve 87 gpm on FI-7980 CUE: After candidate locates valve and indicator, state flow is 87 gpm.	Simulate throttling open valve and observes indicator	
●	Throttle UW-836 to achieve approximately 118 gpm as indicated by FI-7979, Jacket Water Flow	Simulate throttling open valve and observes indicator	
18.	IF Conventional Service Water is available CUE: Conventional Service Water is NOT available	No Action Required	
19.	Verify the following breakers open: F3-1 52GT/2F SB1-3 CUE: All Breakers are OPEN	No Action Required	

Perform a Startup of the Unit 2 Appendix R Diesel Generator - Supplying Appendix R Loads

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
20.	Observe NOTE before step 4.3.14 .	Reviews Note	
21.	Verify GT-2 is Out of Service CUE: GT-2 is out of service	No Action Required	
22.	Verify breaker B3-3 is closed	Observes Breaker Closed	
23.	Verify 3 damper set west of App R diesel are open. CUE: Dampers are open	Observes Damper position	
24.	Observe NOTES before step 4.3.17	Reviews NOTES	
*25.	Turn 0/Manual/Auto switch to MANUAL	Simulate rotating switch to MANUAL	
*26.	Press and Hold the Manual Run/Stop Button for a minimum of 3 seconds CUE: Diesel Engine starts	Simulates Pressing button	
27.	Observe NOTES before step 4.3.19	Reviews NOTES	
*28.	Close breaker SBO/ASS CUE: symbol indicates _-_	Press and Hold __ pushbutton until symbol indicates _-_	
29.	JPM is complete		

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIATING CUES:

1. CCR has been evacuated due to a fire.

2. Normal Unit 2 Offsite power and EDGs are unavailable.

3. The 480V Switchgear room is inaccessible.

4. You are directed to Start the Unit 2 Appendix R Diesel Generator Supplying Appendix R Loads in accordance with 2-SOP-27.6 up to and including closing the SBO/ASS breaker.

TASK STANDARD:

The Appendix R Diesel Generator is running and breaker SBO/ASS is closed.

Initiating Cue:

ENTERGY (IP2)
JOB PERFORMANCE MEASURE

Operator Name: _____

Employee ID #: _____

Evaluator: _____

Date: _____ **SAT** **UNSAT**

This JPM was administered for qualification? YES NO

DIRECTIONS TO OPERATOR:

When I tell you to begin, you are to *simulate* establish backup cooling to the Charging Pumps

I will describe the general system conditions. Before you start, I will state the Task Standard and Initiating Cues, and answer any questions. Utilize all reference material appropriate for this task.

INITIATING CUES:

1. The CCR has been evacuated due to a fire and 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented.

2. CCW cooling to the Charging pumps is not available.

3. The CRS has directed you to establish backup cooling to the Charging Pumps per 2-AOP-SSD-1, Attachment 10.

TASK STANDARD:

Backup cooling has been established to the Charging Pumps.

◆ **Denotes Critical Step**

STEP	DESCRIPTIONS / CUES & NOTES	STANDARD	S/U
1	Obtain correct procedure	2-AOP-SSD-1, Attachment 10, Step 10.1	
10.1	Connect hose to Charging Pumps City Water Backup Header Stop, route hose to drainage **CUE:** Hose connected	Locate hose and 1873D connection and simulate routing hose to suitable drainage	
◆ 10.2	Close Charging Pumps City Water Backup Telltale Stop **CUE:** Valve Closed	1874 to Clockwise direction	
◆ 10.3	Close Charging Pumps Oil and Fluid Drive Heat Exchanger Outlet Stop	756B to Clockwise direction	
◆ 10.4	Close Charging Pumps Oil and Fluid Drive Coolers Inlet Stop CUE: Valve Closed	756A to Clockwise direction	
◆ 10.5	Open Charging Pumps City Water Backup Outlet Header Stop **CUE:** Valve Open	1873C to counter-clockwise direction	
◆ 10.6	Open Charging Pumps City Water Backup Outlet Header Stop **CUE:** Valve Open	1873D to counter-clockwise direction	
◆ 10.7	Open charging Pumps City Water Inlet Header Stops CUE: Valve Open	1873A to the counter-clockwise direction	
◆ 10.8	Open charging Pumps City Water Inlet Header Stops CUE: Valve Open	1873B to the counter-clockwise direction	

Any area of weakness observed? YES ☐ NO ☐ _____
Examinee Signature

All areas of observed weakness discussed _____
Evaluator Initials

Description of problem area:

Description of reviewed information:

INITIATING CUES

1. The CCR has been evacuated due to a fire and 2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, has been implemented.

2. CCW cooling to the Charging pumps is not available.

3. The CRS has directed you to establish backup cooling to the Charging Pumps per 2-AOP-SSD-1, Attachment 10.

TASK STANDARD:

Backup cooling has been established to the Charging Pumps.

RETURN THIS TO INSTRUCTOR WHEN YOU HAVE COMPLETED

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE • The hose to connect valve 1873D to floor drain is staged outside 22CHP cell. • Valves 756A&B and 1873A-D are located in overhead pipe chase outside 22CHP cell. A ladder to access overhead is staged adjacent to local control panel between 22CHP and 23CHP cells.	
10.1 __Connect hose to 1873D (CHARGING PUMPS CITY WATER BACKUP OUTLET HEADER STOP) and route to <u>any</u> drain.	
10.2 __Close 1874 (CHARGING PUMPS CITY WATER BACKUP TELLTALE STOP).	
10.3 __Close 756B (CHARGING PUMPS OIL AND FLUID DRIVE COOLERS OUTLET STOP).	
10.4 __Close 756A (CHARGING PUMPS OIL AND FLUID DRIVE COOLERS INLET STOP).	
10.5 __Open 1873C (CHARGING PUMPS CITY WATER BACKUP OUTLET HEADER STOP).	
10.6 __Open 1873D (CHARGING PUMPS CITY WATER BACKUP OUTLET HEADER STOP).	
10.7 __Open 1873A (CHARGING PUMPS CITY WATER BACKUP INLET HEADER STOP).	
10.8 __Open 1873B (CHARGING PUMPS CITY WATER BACKUP INLET HEADER STOP).	
10.9 __**EXIT** this attachment.	

• • • END • • •

Facility: Indian Point 2 Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:
Reset simulator to IC-118 Load Simulator Schedule-Scenario1
The Plant is in a 100% normal full power lineup.
PORV PCV-456 and associated block valve are tagged out due to PCV-456 blowing fuses.

Turnover:
Maintain 100% Power

Critical Tasks:
1. Establish greater than 400 gpm AFW flow to the SGs before transition out of E-0 or tripping the RCPs in the FR-H.1. (E-0--F)
2. Isolate Feedwater flow to and steam flow from the ruptured SG before transition to ECA-3.1 occurs. (E-3--A)
3. Establish/Maintain RCS temperature to ensure transition out of E-3 does not occur due to either of the following:
   - RCS temperature too high to maintain required subcooling
   - RCS temperature too low resulting in severe challenge to the subcriticality or integrity CSF. (E-3--B)
4. When SI termination criteria are met, stop SI pumps before completion of ECA-3.3 step 9. (ECA-3.3--A)

Event No.	Malf. No.	Event Type*	Event Description
1	CNH-PCS008D	C(ATC) C(CRS)	23 MFRV fails closed in auto with manual available ramped over 10 minutes.
2	XMT-CVC019A	I(ALL)	VCT level instrument fails low causing automatic makeup and charging pump suction to swap to the RWST.
3	MAL-RCS014C	R(ATC) N(CRS) N(BOP)	SGTL on 23 SG 900 gpd. This will require a downpower and eventual shutdown. **Tech Spec action for CRS** S/D plus TS for failure of B/D isol valve
4	MAL-RCS014C	M(ALL)	SGTR on 23 SG grows to 280 gpm. This will lead to team performing a manual reactor trip and SI.
5	MAL-EPS007D	C(CRS)	Fault on 480 V Bus 6A during the SI loading sequence. This will require tripping RCPs.
6	MOC-AFW001	C(CRS) C(BOP)	21 AFW pump will not auto start (inserted at setup). This along with loss of 6A will result in inadequate heat sink until addressed by team.

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

Session Outline:

The evaluation begins with the plant at 100% power steady state operation.

Shortly after the team takes the watch, 23 MFRV will slowly fail closed. The team should recognize the failure and the ATC should transfer control of the valve to manual per administrative guidance of EN-OP-115, Conduct of Operations. The team will enter 2-AOP-FW-1, Loss of Main Feedwater, but no equipment manipulations will be required since 23 MFRV was already placed in manual.

While the team is progressing through 2-AOP-FW-1 (or after exit), VCT level instrument LC-112 will fail low. This will cause an automatic makeup and charging pump suction to swap to the RWST. The team will respond per 2-AOP-CVCS-1, CVCS Malfunctions.

After the team has stabilized charging pump suction, a 900 gpd steam generator tube leak will develop on 23 SG. The team will implement 2-AOP-SG-1, Steam Generator Tube Leak, and begin a shutdown. SGBD Valve 1216 will not close automatically and will only close if failed in the field.

While progressing with the shutdown, the tube leakage in 23 SG will increase to 280 gpm. The team will diagnose the increase in leak rate and trip the reactor and actuate SI. The manual reactor trip pushbutton on the flight panel will not work, however the supervisory panel button will function. When SI is actuated, 480V Bus 6A will fault, which will lead to the SI Blackout logic being made up causing all CCW Pumps to be off.

Following the reactor trip and SI, the team will have to establish AFW flow because 23 AFW Pump does not have power and 21 AFW Pump will not auto start (malfunction). 22 AFW pump must be placed in service to feed 23 and 24 SGs. 21 AFW may be manually started to feed 21 and 22 SGs or 22 AFW pump may be used to feed all four SGs. The team will progress through E-0, Reactor Trip or Safety Injection and transition to E-3, Steam Generator Tube Rupture. 23 SG will be isolated and the team will cool down the RCS in preparation to depressurize. The team will be unable to depressurize the RCS using E-3. Normal spray cannot be used because no RCPs are in service. Auxiliary spray will not be available because instrument air to containment will not be available (PCV-1228 will not open). Neither PORV will be available; one is tagged out, and the other's closed block valve does not have power. The team will transition to 2-ECA-3.3, SGTR without Pressurizer Pressure Control.

The scenario will be terminated when SI pumps have been stopped after RCS depressurization in ECA-3.3.

Procedural flow path: 2-AOP-FW-1, 2-AOP-CVCS-1, 2-AOP-SG-1, (2-POP-2.1, 2-AOP-RSD-1, or 2-AOP-RLR-1), E-0, E-3, ECA-3.3

Scenario Critical Task and Malfunction Analyses

Critical Tasks:

CT-1

Establish greater than 400 gpm AFW flow to the SGs before transition out of E-0 or tripping the RCPs in the FR-H.1.

Safety Significance: Failure to establish AFW flow will lead to going to FR-H.1 would lead to bleed and feed and hamper efforts to stop RCS leakage. This would lead to a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: The operating team will have indication of AFW flow and a procedural step in E-0 to establish flow.

Measurable Performance Indicators: If flow is not established, the team will transition to FR-H.1 and not satisfactorily meet the complete the critical task.

Performance Feedback: The team will be able to establish AFW flow by initiating flow with 22 AFW pump for 23 and 24 SGs (and possibly 21 and 22 SGs) and starting 21 AFW pump to feed 21 and 22 SGs (unless fed using 22 AFW pump).

CT-2

Isolate Feedwater flow to and steam flow from the ruptured SG before transition to ECA-3.1 occurs.

Safety Significance: Failure to isolate Feedwater flow would lead to a high SG level and hamper efforts to stop RCS leakage.This would lead to a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: The operating team will have SG NR level indications and steps in E-3 to isolate Feedwater flow.

Measurable Performance Indicators: If Feedwater is not secured, the ruptured SG pressure will lower and transition to ECA-3.1 will be made. This will constitute not meeting critical task.

Performance Feedback: The team will have indications of AFW flow and SG pressure to indicate success.

CT-3

Establish/Maintain RCS temperature to ensure transition out of E-3 does not occur due to either of the following:

- RCS temperature too high to maintain required subcooling
- RCS temperature too low resulting in severe challenge to the subcriticality or integrity CSF.

Safety Significance: Overcooling could lead to a challenge to the integrity status CSF and/or lose subcooling. In an extreme overcooling subcriticality could be challenged. All of these events would hampers events to stop RCS leakage, so this would lead to a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: The operating team will have guidance in E-3 to control cooldown and indications of RCS temperature and pressure to aid in complying with this guidance.

Measurable Performance Indicators: If an overcooling event occurs, the team will transition out of E-3 to FR-P.1. This will constitute not meeting critical task.

Performance Feedback: The team will have indications from CETs, subcooling, and SG pressures.

CT-4

When SI termination criteria are met, stop SI pumps before completion of ECA-3.3 step 9.

Safety Significance: Failure to terminate SI could lead to lifting a SG safety and releasing radioactivity to the environment. This would constitute a degradation of any barrier to fission product release.

Cue: The operating team will have guidance in ECA-3.3 to terminate SI along with indication that 23 SG level in increasing in an uncontrolled manner.

Measurable Performance Indicators: The team progresses beyond step 9 of ECA-3.3 without terminating SI will constitute not meeting critical task.

Performance Feedback: The team will have indications SG NR and wide range level and indication of SI pumps status.

Credited Malfunctions:

1. 23 MFRV will fail in auto (C for ATC/CRS). The ATC will have to take action to control Feedwater flow or a reactor trip will occur. The CRS is given credit for supervising actions. The BOP operator will acknowledge alarms and may aid in diagnosis and control of Feedwater flow, however we are not taking credit for his actions.

2. VCT level instrument failure low (I for ALL). The ATC and BOP both have control board indications that will be used to diagnose failure. The BOP will acknowledge alarms and take action to restore Charging Pump suction to the VCT. The ATC will have to monitor for reactivity effects when the Charging Pump is taking suction from RWST. Additionally, the ATC will secure makeup at the proper time. The CRS will coordinate and supervise activities.

3. 23 SG Tube Leak. The BOP and ATC will have to diagnose event. The BOP will take actions to isolate leakage. A load reduction will occur which will be a reactivity manipulation for the ATC and normal plant operation for the BOP and CRS. This malfunction also requires evaluation of Tech Specs by the CRS.

4. 23 SG Tube Rupture. This is a major malfunction for all operators. Complicating the event are setup malfunctions of one PORV being tagged out, another PORV being unavailable due to Bus 6A fault and instrument air to containment not being available.

5. 480 Bus 6A fault. This will lead to SI with Blackout logic being made up which will cause no CCW pumps to be available. Operators will have to recognize this and secure RCPs. The scenario is more complicated if do not do this in a timely manner because when they trip on their own 6.9KV busses are lost which means the condenser is not available for cooldown. Only the CRS is given credit for this because either board operator may perform this action.

6. 21 AFW auto-start failure. This along with the 480 Bus 6A failure will result in no AFW flow. Manual action by the BOP will be required to restore feed. The CRS and BOP are given credit for this action, but there is a reasonable chance that the ATC will actually perform the action.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset		Reset Simulator to 100% power IC
SES Setup Batch File	**Run setup schedule** and verify malfunctions and over-rides have been entered.	Loads 21 ABFP autostart malfunction. Loads tagout of PORV 456 and block valve 536. Loads failure of PCV 1216. Loads failure of flight panel Rx Trip pushbutton Loads MFRV Failure on Trigger 1. Loads VCT Level Failure on Trigger 2. Loads SGTR 900 gpd on Trigger 3. Sets trigger 4 to increase SGTR to 280 gpm. Sets trigger 30 to auto actuate on reactor trip. Sets trigger 29 to actuate on SI initiation. Loads 1228 fails closed on Trigger 30. Loads Bus 6A fault on trigger 29.
Floor Setup	**Perform setup checklist.** Update the Protected Equipment PC. *Risk is Yellow*	**HANG PROTECTED EQUIPMENT** tags for: 455C PORV and block. Place 536 in TPO and PORV 456 in Close and hang danger tags. Crew walks the panels and assumes the watch.
Event 1	**Click the Trigger 1 button at lead evaluator direction.**	23 MFRV fails closed in auto (manual available) Ramped over 10 min IMF CNH-PCS008D to 35 ramped over 600s.
Role Play	**If NPO sent to investigate 23 MFRV:**	NPO reports no obvious problems.
Event 2	**Click the Trigger 2 button at lead evaluator direction.**	VCT level transmitter fails to zero. IMF XMT-CVC019A to 0 with no ramp
Role Play	**If NPO sent to investigate VCT level instrumentation:**	NPO reports no obvious problems.
Event 3	**Click the Trigger 3 button at lead evaluator direction.**	SGTL on 23 S/G 900gpd IMF MAL-RCS014C to 0.01 with no ramp
Role Play	**If NPO sent to N16 panel:**	Acknowledge the local alarm and report 900 gpd on 23 main steam line. Team will start a shutdown based on SGTL
Role Play	**If NPO sent to fail 1216**	Delete malfunction AOV-SGB013A. Fail to closed if needed.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Event 4	**Click the Trigger 4 button at lead evaluator direction**	SGTR on 23 SG grows to 280 gpm MAL-RCS014C modified from 0.01 to 4.0 no ramp
Role Play	**If asked to investigate PCV-1228 failure**	NPO reports no obvious problem. MTC reports valve appears to be mechanically bound.

Event 1 Description:		Feedwater Regulating valve for 23 SG fails closed in auto control. RO takes manual control and restores FW flow to 23 SG. Team responds with AOP-FW-1, Loss of Feedwater or AOP-INST-1, Instrument/Controller Failures.
Time	**Position**	**Examinee's Actions or Behavior**
	ATC	Diagnose FRV malfunction by observing 23 SG NR level trending down. The SG Level Deviation Alarm may actuate. • Place 23 SG FRV in manual and match FF with SF.
	CRS	Supervise the crew during AOP-FW-1 or AOP-INST-1. • Direct RO to perform immediate actions of AOP-FW-1 or INST-1. • Implement AOP-FW-1 or INST-1. • Verify 23 SG FW control is in manual and 23 SG level is under control. • Ensure notifications are made and troubleshooting is requested.
Lead Evaluator		At the discretion of the lead evaluator, direct the Booth Instructor to actuate trigger 2. When crew diagnoses VCT level failure, proceed to next event.

Event 2 Description: VCT Level transmitter fails low, VCT auto makeup starts and Charging Pump suction swaps to the RWST. Team responds per 2-AOP-CVCS-1, Charging and Volume Control Malfunctions		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP	Diagnose VCT level failure based on Auto-Makeup and lowering VCT Level without lowering pressure.
	CRS	Supervise the crew during 2-AOP-CVCS-1. • BOP will align charging Pump Suction to the VCT. • ATC will place make up controls to stop. • Team should respond prior to significant temperature/power effect has occurred. Turbine load will be adjusted if temperature/power effect occurs. • Maintain VCT pressure 2-5 psig above previous value.
Lead Evaluator		At the discretion of the lead evaluator, direct the Booth Instructor to actuate trigger 3. When crew diagnoses SGTL, proceed to next event.

Event 3 Description: 900 gallon per day Steam Generator Tube Leak on 23 SG. Team responds per 2-AOP-SG-1, Steam Generator Tube Leak.		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP	Perform ARPs for alarms associated with SGTL. Dispatch NPO to N-16 panel.
	ATC/BOP	Observe R-45 and R-49 in alarm and diagnose that leak rate is therefore greater than 75 gpd. Diagnose failure of PCV-1216 23 SG BD Isol valve to auto close. May have valve failed locally.
	CRS	Enters 2-AOP-SG-1, Steam Generator Tube Leak. • Directs crew actions to estimate the size of the leak and minimize secondary contamination. • Directs Chemistry to calculate leak rate. • Notifies HP of SGTL. • Determines shutdown must be made.
	ALL	Diagnose leak rate is approximately 0.7 GPM (900 gpd).
	CRS	Evaluate Technical Specification 3.4.13 RCS Operational Leakage. • Determine Condition B applies because primary to secondary exceeds limit – be in Mode 3 in 6 hours and Mode 5 in 36 hrs.
	ATC	Monitors Pressurizer Level and Pressure for abnormal trends due to SGTL. If level is lowering: • If desired, reduces letdown flow to 45 gpm. • If desired, starts a second charging pump.
	BOP	Coordinates with RO to reduce letdown to 45 GPM, if desired. • Open 200A. • Close 200B and 200C. • Verify PCV-135 controlling between 225 and 275 psig.
	ALL	Perform load reduction as per Tech Spec/AOP

What do significance of this failure? What actions to manually isolate B/D?

Event 3 Description: 900 gallon per day Steam Generator Tube Leak on 23 SG. Team responds per 2-AOP-SG-1, Steam Generator Tube Leak.		
Time	**Position**	**Examinee's Actions or Behavior**
Lead Evaluator		When Lead Evaluator is satisfied with amount of load reduction observed, direct the Booth Instructor to manually actuate trigger 4 to increase tube leakage. When crew diagnoses SG tube leakage has dramatically increased, proceed to next event.

Event 4 Description: SGTL increases in size to 280 gpm rupture. Team manually trips, actuates SI and implements E-0.		
Time	Position	Examinee's Actions or Behavior
	ATC	Diagnose increase rate of leakage. • Determine leak rate is greater than the capacity of two charging pumps and 45 gpm letdown.
	CRS	Directs team to evaluate IAAT Step 4.1. • Directs RO to trip reactor. • Directs RO/BOP to manually actuate SI.
	ATC	Attempts to trip reactor. Flight panel button not working properly
	BOP/ATC	Trips reactor from supervisory panel. Manually actuates SI.
	CRS	Directs team to perform immediate actions of E-0, Reactor Trip or Safety Injection.
	ATC	Performs E-0 immediate actions: • Verifies Reactor tripped. • Verifies Turbine tripped. • Verifies SI actuated. LIST E-0 Actions rqd.
	BOP	Verifies all 480V buses energized except 6A.
	CRS	Verify immediate actions using the procedure. • Direct RO and BOP actions during use of EOPS.

General Comment → LIST CT FIRST Before Actions Should list all reqd operator actions for satisfy CT

Event 4 Description: SGTL increases in size to 280 gpm rupture. Team manually trips, actuates SI and implements E-0.		
Time	Position	Examinee's Actions or Behavior
	CRS/ATC	Verify AFW pumps. • No AFW pumps are providing flow to SGs. • 21 AFW may be started manually to feed 21 and 22 SGs. • 22 AFW must be placed in service to feed 23 and 24 SGs, and may be used to feed 21 and 22 SGs • May establish 400 gpm AFW flow and have BOP align remaining SGs in Attachment 1. Bell all CT actions
Critical Task		WOG CT: E-0--F Establish greater than 400 gpm AFW flow to the SGs before transition out of E-0 or tripping RCPs in FR-H.1.
	BOP	Perform Attachment 1, Automatic Action Verification. • Start a charging pump. • Dispatch NPO to reset lighting and MCCS 24A, 27A, and 29A. • Stop condensate pumps. • Use 22 AFWP to align AFW flow to 23 and 24 SGs if not already done.
	ALL	Monitor 23 SG level. • When NR level > 10%, takes prudent operator action to isolate AFW flow to 23 SG and adjust atmo to 1030 psig. (Note this is part of critical task E-0 -- F). • Ensures total AFW flow to intact SGs remains >400gpm.

Event 4 Description: SGTL increases in size to 280 gpm rupture. Team manually trips, actuates SI and implements E-0.		
Time	Position	Examinee's Actions or Behavior
	CRS/ATC	• Verify SI Flow. Place one RHR pump CS in pullout. • RCPs are tripped because of black out logic which keeps CCW pumps from running. ***Note: This may be performed prior to reaching this step. If this action is delayed, the RCPs will eventually trip on their own and 6.9KV busses may be lost. This will effect scenario by losing Circulating Water Pumps, which will make Condenser not available for cooldown.*** • Check Seal Cooling. • Check RCS temperatures trending to 547. • Check PRZR PORVS, Spray valves and aux spray closed. • Check if RCPs should be stopped. — list criteria for stopping RCPs • Check for faulted SG. • Check for ruptured SG. ○ Determine 23 SG is ruptured.
	CRS	Transition to E-3, Steam Generator Tube Rupture.
Lead Evaluator		Proceed to the next event when the crew transitions to E-3, Steam Generator Tube Rupture.

Event Description:		23 SG is ruptured. Team performs actions of E-3 Steam Generator Tube Rupture. 23 SG is isolated and RCS is cooldown is performed in preparation to depressurize. Team will diagnose that depressurization cannot be performed per E-3.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS	Transition to E-3, Steam Generator Tube Rupture. • Direct actions of the team during implementation of E-3.

	CRS/ATC	Determine if RCPs should be stopped.
		Identify ruptured SG.
		• Determines 23 SG is ruptured.
		Isolate Flow from Ruptured SG.
		• Check 23 SG atmospheric steam dump controller set at 1030 psig
		• Check 23 SG atmospheric steam dump closed. LIST valve #
		• Check 22 and 23 SG intact.
		  ○ Dispatch NPO to close MS-42.
		• Verify 23 SG blowdown isolation valves are closed. ~~Closed~~ List valves
		• Dispatch NPO to locally isolate 23 SG upstream traps and MSIV bypass.
		• Close 23 SG MSIV .
		• Check 23 SG level > 10%.
		  ○ When > 10%, stop feed flow to 23 SG.
		LIST ALL Affected S/G Valves

Critical Task		WOG CT: E-3--A Isolate feedwater flow to and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.

Event Description:		23 SG is ruptured. Team performs actions of E-3 Steam Generator Tube Rupture. 23 SG is isolated and RCS is cooldown is performed in preparation to depressurize. Team will diagnose that depressurization cannot be performed per E-3.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS/ATC	Check 23 SG > 440 psig. Initiate RCS Cooldown. • Determine required CET temperature. • Dump steam from 21, 22, and 24 SGs to the condenser. • When CETs are < target temperature, stop dumping steam and control temperature at value less than target temperature.. Check intact SGs. Check PORVs and Block Valves. • Check power available to block valves. • Check PORVs closed. • Cannot open any block valves. Reset SI. — list all affected valves & pumps Reset Phase A. Establish IA to containment. list valves • Determine PCV-1228 will not open. Stop RHR pumps and place in auto.
Critical Task		WOG CT: E-3--B Establish/maintain RCS temperature such that transition from E-3 does not occur due to o RCS temperature too high – unable to maintain required subcooling. o RCS temperature too low – severe challenge occurs to sub criticality or integrity status trees.

Event Description:		23 SG is ruptured. Team performs actions of E-3 Steam Generator Tube Rupture. 23 SG is isolated and RCS is cooldown is performed in preparation to depressurize. Team will diagnose that depressurization cannot be performed per E-3.
Time	**Position**	**Examinee's Actions or Behavior**

	ATC/CRS	Establish maximum Charging Flow with suction aligned to RWST.
		• Check ruptured SG pressure stable or increasing.
		• Check Subcooling based on CETs > than value from table.
		• Depressurize the RCS.
		  o Determine spray not available due to no RCPs and no instrument air.
		  o Diagnose PORVs not available.
		  o Determine auxiliary spray cannot be aligned due to no instrument air.

	CRS	Transition to ECA-3.3, SGTR without Pressurizer Pressure Control.
Lead Evaluator		Proceed to the next event when transition to ECA-3.3 is made.

Event Description:		Instrument Air to Containment PCV-1228 will not open and both PORV block valves cannot be opened. Team performs ECA-3.3, SGTR with out pressurizer pressure control.
Time	**Position**	**Examinee's Actions or Behavior**
	RO/CRS	Check status of 480V buses. • Dispatch NPO to manually load equipment onto buses. Check 23 SG NR level less than 73%. Try to establish normal spray. Try to restore a PORV. Try to establish auxiliary spray. Check intact SG levels. Check PRZR Level > 14%. Determine if SI can be terminated. • Check subcooling > value from table. • Check secondary heat sink. • Check RVLIS > 60%. • Check 23 SG NR level increasing in an uncontrolled manner. Stop SI pumps and place in AUTO.
Critical Task		WOG CT: ECA-3.3--A Stop all SI Pumps when termination criteria are met.
Lead Evaluator		Terminate scenario any time after SI pumps are stopped, or at the discretion of the Lead Evaluator.

Facility: Indian Point 2 Scenario No.: ~~4~~ #2 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:
Reset simulator to IC-287 Load Simulator Schedule-Scenario4
The Plant is in Mode 1 just above 5% power preparing to come on line.

Turnover:
Raise power to approximately 8-10% to place MTG in service. Prepare turnover sheet with Initial Plant Conditions

Critical Tasks:
1. Insert negative reactivity into the core by at least one of the following methods before completing FR-S.1 step 4: (FR-S.1--C)
   - De-energize the control rod drive MG sets
   - Place rod control in manual and insert RCCAs
   - Establish emergency boration flow to the RCS
2. Establish at least 800 gpm AFW flow to the SGs before completion of FR-S.1 step 3. (E-0 -- F)
3. Manually actuate at least one train of SIS actuated safeguards before completion of E-0 step 4. (E-0 -- D)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(ATC) N(CRS) N(BOP)	Power escalation.
2	MOC-SWS007	C(CRS) C(BOP)	22 Service Water Pump trip. **Tech Spec for CRS**
3	XMT-RCS028 A	I(ALL)	Controlling PZR Pressure transmitter fails high. **Tech Spec for CRS**
4	MOV-CCW008	C(CRS) C(BOP)	FCV-625 spurious closure.
5	MAL-SGN005	~~C~~ M(CRS) C(ATC)	Steam leak in the Turbine Building leading to plant trip. Appears to be MT?
6	BKR-PPL003/4	~~M~~ C(ALL)	Entered at setup, Reactor Trip Breakers will not open causing team to enter 2-FR-S.1.
7	RLY-PPL487/8	C(CRS) C(BOP)	Entered at setup, SI does not automatically actuate. Manual actuation will be required.

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

Session Outline:

The scenario begins with the plant at 5% power with no equipment is out of service. The team has been instructed to raise power to 8-10% and place MTG in service.

Event 1

After taking the watch, the crew will commence raising power. Event 2 After the power escalation has progressed, 22 SWP will trip. The team will start another pump per 2-ARP-SJF.

Event #3

Following the restoration of SW, a failure high of PT-455 will occur. The team will respond using 2-AOP-INST-1 "Instrument or Controller Failures." The channel will be removed from service.

After the channel is removed from service, FCV-625 will go closed with no apparent reason. The team should respond per 2-ARP-SGF and re-open the valve. If the team elects to not re-open the valve, the scenario can continue.

Prior to completion of the Subsequent Actions of 2-AOP-CCW-1, a steam break will occur in the Turbine Building. The team will attempt to manually trip the plant but the reactor trip breakers will not open.

The reactor will not trip from the Control Room and the team will respond per 2-FR-S.1, "Response to Nuclear Power Generation / ATWS," and will shutdown the reactor by manually inserting control rods and initiating Emergency Boration. The reactor trip breakers will not be locally opened after an NPO is dispatched, until after emergency Boration has been aligned. One MSIV will fail to close from the control switches. The team will proceed through 2-FR-S.1 until transition to 2-E-0, "Reactor Trip or Safety Injection."

After the transition to 2-E-0 is made, the team will determine that three SGs are intact and 23 SG is faulted. The Team will also determine that SI did not automatically actuate and must manually actuate SI. The team will transition to 2-E-2, Faulted Steam Generator Isolation and isolate 23 SG. The scenario is terminated after the actions of 2-E-2 are complete and a transition to 2-E-1, Loss of Reactor or Secondary Coolant is announced or at the discretion of the lead examiner.

Procedure flow path: 2-POP-1.3, 2-ARP-SJF, 2-AOP-INST-1, 2-ARP-SGF, 2-AOP-UC-1, 2-E-0, 2-FR-S.1, 2-E-0, 2-E-2

Scenario Critical Task and Malfunction Analyses

Critical Tasks:

CT-1

Insert negative reactivity into the core by at least one of the following methods before completing FR-S.1 step 4:

- De-energize the control rod drive MG sets
- Place rod control in manual and insert RCCAs
- Establish emergency boration flow to the RCS.

Safety Significance: Failure to insert negative reactivity would result in a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: There will be numerous indications that the reactor did not trip. E-0 and FR-S.1 will provide guidance for tripping the reactor.

Measurable Performance Indicators: All three methods will be demonstrated by the team until the reactor is tripped. Failure to continue attempts to insert negative reactivity while reactor power is above 5% will constitute failure to complete the critical task.

Performance Feedback: Numerous indications of reactor power, charging flow, and trip breaker indications.

CT-2

Establish at least 800 gpm AFW flow to the SGs before completion of FR-S.1 step 3.

Safety Significance: Failure to establish required AFW flow could limit heat removal with power above 5%. This would lead to a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: FR-S.1 will direct establishing 800 gpm AFW flow.

Measurable Performance Indicators: If step 3 of FR-S.1 is completed without establishing proper AFW flow this will constitute a failure to complete the critical task.

Performance Feedback: The team will have indications of AFW flow.

CT-3

Manually actuate at least one train of SIS actuated safeguards before completion of E-0 step 4.

Safety Significance: Failure to initiate safety injection would lead to a degraded emergency core cooling system (ECCS).

Cue: The team will have indication of a faulted SG and alarms indicating that a delta-P SI should have occurred. E-0 will direct initiating SI.

Measurable Performance Indicators: Failure to initiate SI by the completion of E-0 step 4 will constitute a failure to complete the critical task.

Performance Feedback: The team will have indications of pumps and valves to show that SI actuated.

Credited Malfunctions:

1. 22 SW Pump trip. The BOP will diagnose the pump trip. Another essential header SW pump should be started per the ARP. The CRS will coordinate and supervise activities. The CRS will evaluate Tech Specs for the pump trip.

2. PT-455 failing high. The ATC and BOP will diagnose the failure based on PZR Hi Press alarm and open spray valve. The ATC will take manual control of PZR pressure. The BOP will remove the channel from service and may trip bistables. The CRS will coordinate and supervise activities. The CRS will evaluate Tech Specs.

3. FCV-625 goes closed. The BOP will diagnose that the valve has gone closed after acknowledging CCW Thermal Barrier Low Flow Alarm. Per the ARP, the valve can be re-opened and flow checked locally. The scenario may proceed without re-opening the valve.

4. Steam Line Rupture. The ATC and BOP will diagnose a steam line breaker by changes in power along with audio indications. The ATC and CRS will determine that reactor needs to be tripped and MSIVs closed. The ATC will attempt to trip the reactor.

5. ATWAS/Failure of 21 MSIV. This is major malfunction set for the whole team. FR-S.1 will be entered and Emergency Boration will be initiated prior to the reactor being tripped locally. 21 MSIV failure will cause 21 SG to blow down requiring the team to secure feeding it.

6. Failure of automatic SI. The BOP with concurrence of the CRS will actuate SI when it is determined that an automatic SI is warranted but did not occur..

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset	**Use IC for NRC Scenario 4 5% Power Starting Up**	Reset Simulator to 5% power IC
SES Setup Schedule	**Run Schedule** and verify malfunctions and over-rides have been entered	Loads Reactor Trip Breaker malfunction Loads Auto SI Failure Loads MS Isolation failure Loads PT-455 failure on Trigger 1 Loads FCV-625 failure on Trigger 2 Loads Turbine Hall Steam Leak on Trigger 3
Floor Setup	Perform setup checklist	
Event 1	Actuate Trigger 1 **At lead evaluator direction**	When directed by the Lead Evaluator, activate Trigger 1 to cause 22 SWP to trip.
Role Play	If called to check 22 SWP	Pump Motor has slight acrid odor. Breaker tripped on over-current. The pump that was started is operating with no issues.
Event 2	Actuate Trigger 2 **At lead evaluator direction**	When directed by the Lead Evaluator, activate Trigger 2 to cause PT-455 to fail high with a 10 second ramp. XMT-RCS028A to 2500 with 10s ramp
Role Play	If I&C is contacted about PT-455 failure	Report back that a troubleshooting package will be prepared
Event 3	Actuate Trigger 3 **At lead evaluator direction**	When directed by the Lead Evaluator, activate Trigger 3 to FCV-625 to fail closed. MOV-CCW008 to close **AS SOON AS VALVE GOES CLOSED REMOVE MALFUNCTION (valve will not re-open when malfunction is removed)**
Role Play	When Nuclear NPO dispatched	Nuke NPO reports that flow at FIC-625 is normal after valve is re-opened.
Event 4	Actuate Trigger 4 **At lead evaluator direction**	When directed by the Lead Evaluator, activate Trigger 4: Insert MAL-SGN005 to value 60 with no ramp or delay.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Role Play	If NPO dispatched to look for steam leak	If NPOs are dispatched to look for steam, report back that a large steam leak exists at the north end of the turbine hall.
Role Play	NPO cannot locally trip reactor until Emergency Boration is commenced. Actuate Trigger 5 to trip reactor.	If trigger does not work, remove overrides preventing reactor trip. May have to insert manual reactor trip

Event # 1

Event Description:	Power ascension using POP-1.3 in preparation for Main Turbine Startup and Synchronization.	
Time	**Position**	**Examinee's Actions or Behavior**
	CRS	Supervise the actions of the team during power ascension • Refers to POP-1.3 Refers to Reactivity Summary Sheet • Develops and implements a startup plan • Develops and implements a reactivity plan • Directs the RO to make reactivity additions • Directs the BOP to make turbine load changes.
	ATC	Performs reactivity manipulations to support power increase • Withdraw control rods if desired • Perform Dilutions if desired
	BOP	Performs peer checks for reactivity manipulations
Lead Evaluator		When sufficient power ascension activities have been observed, direct Booth Operator to activate trigger 1 • Proceed to next event.

Details
How Many Rods? which Rods?
details do a dilution Reqd if so how much?

:

Event Description: 22 Service Water Pump Trip.		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP	• Observes Alarm for SW 1,2,3 Header Low pressure and 22 SWP not running. • Refers to 2-ARP-SJF • Recommends starting another 1,2,3 header pump ? • Starts pump when CRS concurs which pump is he expected to start?
	CRS	• Concurs with start of additional SW pump • Refers to Tech Spec LCO 3.7.8 and determines that Condition A applies and the plant is in a 72 hour AOT
Lead Evaluator		After SW has been restored and time is allowed for CRS to evaluate Tech Specs, direct Booth Operator to activate trigger 2 • Proceed to next event.

Event Description: PT-455 fails high. PZR Master Pressure Controller place in manual. 2-AOP-INST-1 entered. Channel removed from service and automatic pressure control restored.		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP	Notes alarms associated with PZR Pressure
	ATC	Diagnose PT-455 failure and place PZR Pressure Master Controller to manual and control pressure.
	CRS	Implement 2-AOP-INST-1 Verify no other failures Verify pressure control in manual Remove PT-455 from service ***NOTE: Lead Evaluator determine if bistables are to be tripped. May be necessary to allow BOP to take action for failure.*** Return pressure control to automatic
Lead Evaluator		When pressure control has been returned to automatic (or at lead examiner's discretion), instruct booth operator to activate Trigger 2 to cause FCV-625 to close.

Event Description: FCV-625 spuriously closes and can be re-opened per 2-ARP-SGF.		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP	Notes alarm for CCW Thermal Barrier Return low flow.
	CRS BOP	Use 2-ARP-SGF as guidance for re-opening FCV-625 If valve is re-opened, Nuke NPO should be sent to check flow is normal at FIC-625
Lead Evaluator		When the valve has been re-opened, or at the discretion of the lead evaluator, direct the Booth Instructor to activate Trigger 3 to cause a rupture on the Main Steam East Header in the Turbine Building.

Event Description:		Main Steam Line piping rupture in the Turbine Hall. Team identifies steam leak and enters 2-AOP-UC-1, Uncontrolled Cooldown and determines reactor trip is required
Time	**Position**	**Examinee's Actions or Behavior**
	RO	Diagnose Main Steam Leak from the following indications: • rising steam flow • rising reactor power • lowering Tave
	CRS	Implements AOP-UC-1, Uncontrolled Cooldown • Determine an unisolable steam leak exists • Direct the crew to trip the reactor, close MSIVs and go to E-0
Lead Evaluator		Proceed to the next event when the team determines reactor trip is required.

Event Description: Manual and Auto reactor trips do not open the Reactor Trip Breakers. Team Transitions to FR-S.1. All MSIVs are failed open but three will eventually be locally closed. Auto Safety Injection will not occur due to malfunction; but manual SI will function when actuated.		
Time	Position	Examinee's Actions or Behavior
	RO	Manually Trip the Reactor Diagnose reactor did not trip
	RO/BOP	Attempt to trip the reactor using the Reactor Trip Pushbutton on panel SB-2
	RO	Attempt to trip the reactor • Determine reactor did not trip • Inform team reactor is not tripped and go to FR-S.1
	CRS	Direct team to perform actions of FR-S.1, Response to Nuclear Power Generation/ATWS • Dispatch NPO to locally trip the reactor using posted operator aid
	RO	Perform FR-S.1 Immediate Actions: • Attempt to manually trip the reactor LIST Action • Verify NPO is dispatched to locally trip reactor • Manually actuate turbine trip
	BOP	Manually start motor driven AFW pumps and verify > 800 gpm flow to SGs LIST actions ?
Critical Task		WOG CT E-0--F Establish at least 800 gpm AFW flow to the SGs before completion of FR-S.1 step 3.

CT Helpful

Event Description: Manual and Auto reactor trips do not open the Reactor Trip Breakers. Team Transitions to FR-S.1. All MSIVs are failed open but three will eventually be locally closed. Auto Safety Injection will not occur due to malfunction; but manual SI will function when actuated.		
Time	Position	Examinee's Actions or Behavior
	BOP/RO	Initiate Emergency Boration • Check charging pumps running • Open MOV-333, Emergency Boration Valves • Place both BA pumps to fast speed • Place Charging pumps in manual • Open 112B • Close 112C • Place Makeup control to stop • Establish at least 75gpm charging flow • Check PZR pressure < 2335
Critical Task		WOG CT: FR-S.1--C Insert negative reactivity into the core by at least one of the following methods before completing FR-S.1 step 4: • De-energize the control rod drive MG sets • Place rod control in manual and insert RCCAs • Establish emergency boration flow to the RCS
	CRS/BOP	Verify Containment Ventilation Isolation Check SI Status • Check SI Required • Manually Actuate SI Perform steps 1-9 of E-0 List steps of E-0 Check Reactor tripped – dispatch NPO Check Turbine tripped Check SG Levels
Critical Task		WOG CT: E-0 -- D Manually actuate at least one train of SIS actuated safeguards before completion of E-0 step 4. define actions that must be taken to successfully complete CT

Log script actions to close MSIVs

Event Description: Manual and Auto reactor trips do not open the Reactor Trip Breakers. Team Transitions to FR-S.1. All MSIVs are failed open but three will eventually be locally closed. Auto Safety Injection will not occur due to malfunction; but manual SI will function when actuated.		
Time	Position	Examinee's Actions or Behavior
	CRS/RO	Verify dilution paths isolated • Close FCV-111A Check for reactivity insertion from uncontrolled Cooldown Check MSIVs closed • Close all MSIVS • Determine one MSIV will not close from the control room • Dispatch NPO to locally close MSIV valve # into a gated or Both ? Identify Faulted SGs Check SG pressures – decreasing in uncontrolled manner or completely depressurized
Lead Evaluator		The scenario is terminated after the actions of 2-E-2 are complete and a transition to 2-E-1, Loss of Reactor or Secondary Coolant is announced or at the discretion of the lead examiner.

Classify Event

Facility: Indian Point 2 Scenario No.: ~~5 (spare)~~ # 3 Op-Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:
Reset simulator to IC-118 Load Simulator Schedule-Scenario3
The Plant is in a 100% normal full power lineup.
22 AFW Pump has been OOS for 4 hours due to bearing oil line repair.

Turnover:
Maintain 100% Power

Critical Tasks:
1. Establish RCS bleed and feed when the average of the three lowest S/G levels reach 41% WR. (FR-H.1—F)
2. Open all reactor vessel head vent valves before resetting SI in FR-H.1 (non-WOG)
3. Close all reactor vessel head vent valves before exiting 2-FR-H.1. (FR-H.1—G)

Event No.	Malf. No.	Event Type*	Event Description
1	XMT-SGN002 A	I(ALL)	21 SG B Channel of Steam Flow Fails high. Team will place Channel ~~B~~ A in service and enter 2-AOP-INST-1. **Tech Spec Evaluation for CRS**
2	MAL-EPS007B	C(ALL) R(ATC) N(CRS) N(BOP)	Loss of 480V Bus 3A. Team will enter 2-AOP-480V-1 and diagnose that a T.S. shutdown is required due to having 2 inoperable AFW pumps. **Tech Spec Evaluation for CRS** After a Aux Booster feed pump?
3	MAL-CVC002 A	C(CRS) C(ATC)	21 RCP Number 1 Seal leak. Team will have to enter 2-AOP-RCP-1. Continued operation is allowed with existing leakage. 21 RCP seal leakage will increase until tripping the pump and reactor is required.
4	upper left Stop & Control valve fail to close MSIVs may allow flow to trip turbine		
5	MOC-AFW002	M(ALL)	23 AFW pump will not start. This will lead the team to a loss of heat sink.
6	AOV-RCS002 A	C(ALL)	PORV PCV-455C will not open. This will require the team to open the reactor head vent valves to perform bleed and feed.

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

Session Outline:

The evaluation begins with the plant at 100% power steady state operation. The following equipment is out of service:

- 22 AFW pump has been out-of-service for bearing oil line repair for 4 hours. It is expected back within the next 6 hours (ITS 3.7.5 – 72 hr AOT). 21 and 23 AFW pumps are protected equipment.

After taking the watch, 21 SG Steam Flow Channel B transmitter will fail high. The ATC will switch to the A channel and the team will enter 2-AOP-INST-1. The CRS will refer to Tech Spec Table 3.3.2-1 and bistables will be tripped.

After bistables are tripped, a fault will occur on 480V Bus 3A. The team will take actions in accordance with AOP-480V-1, "Loss of Normal Power to any Safeguards 480V Bus." Due to the fault on Bus 3A, 22 EDG cannot re-energize the bus. TS require plant shutdown due to 2 trains of AFW inoperable (TS 3.7.5 condition C).

After team has begun shutdown, 21 RCP will experience #1 seal degradation. The team will perform actions of AOP-RCP-1, Reactor Coolant Pump Malfunctions." The #1 seal degradation severity will then increase requiring reactor trip.

When the reactor is tripped, the turbine upper left stop and control valve pair fail to close. MSIV's must be manually closed to trip the turbine. LIST on D-1

23 ABFP will not auto start and will not be able to be manually started from the Control Room due to 480V circuit breaker failure. (21 ABFP is de-energized due to fault on bus 3A, and 22 ABFP is out of service.)

The team will subsequently transition to FR-H.1, "Loss of Secondary Heat Sink" due to a loss of AFW flow. SG WR levels will lower until bleed and feed is required.

One PRZR PORV will not open when required. The crew will open the Reactor Head Vent valves. 21 AFW pump will then be successfully started from its ASSS supply, or 23 AFW pump from its normal supply after swapping 480V breakers with the spare breaker. The scenario can be terminated after the head vent valves have been closed, or at the discretion of the lead evaluator.

Procedure flow path: 2-AOP-INST-1, 2-AOP-480V-1, 2-POP-2.1 or 2-AOP-RSD-1, 2-AOP-RCP-1, 2-E-0, 2-FR-H.1

Scenario Critical Task and Malfunction Analyses

Critical Tasks:

CT-1

Establish RCS bleed and feed when the average of the three lowest S/G levels reach 41% WR.

Safety Significance: Failure to establish bleed and feed prior to SG dryout could lead to a challenge the fuel and RCS barrier. This would lead to a degradation of any barrier to fission product release.

Cue: The team will have WR SG level indication and FR-H.1 foldout page guidance to establish bleed and feed..

Measurable Performance Indicators: If ~~blled~~ bleed and feed is not established prior to SG WR reaching 14%, this will cause the team to not satisfactorily complete the critical task.

Performance Feedback: The team will have indications of SI flow and CETs.

CT-2

Open all reactor vessel head vent valves before resetting SI in FR-H.1.

Safety Significance: Failure to open reactor vessel head vent valves when one PORV does not open will result in a bleed path less than assume in accident analyses. This could lead to a degradation of any barrier to fission product release.

Cue: The operating team will have indications that one PORV will not open. FR-H.1 will direct opening the reactor vessel head vent valves.

Measurable Performance Indicators: If the team proceeds in FR-H.1 to reset SI without opening the reactor vessel head vent valves, this will constitute not meeting critical task.

Performance Feedback: The team will have indications of CETs and SI flow.

CT-3

Close all reactor vessel head vent valves before exiting 2-FR-H.1.

Safety Significance: Failure to close the reactor vessel head vent valves before exiting FR-H.1 would violate the procedure and lead to having an RCS breach at a point in the EOP flowpath where this is not expected. This would cause a significant reduction of safety margin beyond that irreparably introduced by the scenario.

Cue: The operating team will have guidance in FR-H.1 to remain in the procedure until the reactor vessel head vent valves are closed.

Measurable Performance Indicators: If the team exits FR-H.1 with the reactor vessel head vent valves still open , this will constitute not meeting critical task.

Performance Feedback: The team will have indications of valve position along with RCS pressure.

Credited Malfunctions:

1. 21 SG Steam Flow Instrument Failure. The ATC will diagnose the failure and switch to the operable channel. The BOP will trip bistables, and the CRS will coordinate and supervise activities. The CRS will evaluate Tech Specs for the failure.

2. Loss of 480V Bus 3A. All operators will diagnose the failure. The ATC will have to start a charging pump. The BOP will have to start a SW pump. The CRS will coordinate and supervise activities. The CRS will evaluate Tech Specs for the failure and determine that the plant is in a six hour shutdown statement.

3. 21 RCP No.1 Seal leak and rupture. The ATC and BOP will diagnose the initial failure. No credit is taken for the initial leak since there are no equipment operations. When leakage is increased, the team will have to recognize that trip criteria are met and trip the reactor.

4. 23 AFW Pump Failure. This failure along with Bus 3A and 22 AFW OOS will lead to a loss of heat sink which is a major malfunction for all operators.

5. PORV 455C Failure. This failure will cause the team to use the reactor head vent valves. The BOP and ATC should both perform control board manipulations to complete this task. The CRS will coordinate and supervise activities.

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
IC Reset	**10, 11, 12**	Reset Simulator to 100% power IC
SES Setup Schedule	**Load schedule** and verify malfunctions and over-rides have been entered	Isolates steam supply to 22 ABFP Removes 22 ABFP from service Loads 23 ABFP failure Fails Upper Left Stop Valve Loads PORV 455C failure Loads bus 3A fault on trigger 1 Loads 21 RCP #1 Seal Failure (5.1 gpm) on trigger 2 Increases Seal Failure to > 6 gpm on trigger 3 Sets trigger 30 to actuate on reactor trip Fails Upper Left Control Valve partially open
Floor Setup	**Ensure that 22 Charging Pump is in service.** Perform setup checklist Distribute Turn over sheets	*Update the Protected Equipment Computer display. Risk is yellow.* Ensure that 22 Charging Pump is running and all others are secured Place PCV-1139 (22 ABFP) in Trip and apply Danger Tag Hang PROTECTED EQUIPMENT tags for: 21 & 23 ABFP's Watch team walks the panels and assumes the watch.
Event 1	Actuate Trigger 1 **At lead evaluator direction**	Insert XMT-SGN002A to high value with no ramp or delay.
Role Play	If I&C called to investigate failure:	Inform the team that a troubleshooting package is being developed.
Event 2	Actuate Trigger 2 **At lead evaluator direction**	Insert MAL-EPS007B 480V BUS 3A FAULT without delay or ramp

Simulator Setup and Instructor Directions		
Setup/Event	**INSTRUCTOR ACTIONS**	**EXPECTED RESPONSE/INSTRUCTOR CUES**
Role Play	If NPO sent to investigate Bus 3A Trip Acknowledge requests for I&C to troubleshoot	NPO reports no obvious damage, but bus supply breaker tripped on over current and strong odor of ozone. I&C will develop a troubleshooting plan
Event 3	Actuate Trigger 3 **At lead evaluator direction**	Insert MAL-CVC002A RCP 21 #1 SEAL FAILURE (NR) to value of 4 with 120 second ramp and no delay
Event 4	Actuate Trigger 4 **At lead evaluator direction**	Increase MAL-CVC002A to value 120 with no ramp or delay.
NOTE:	When Rx is tripped	Upper left stop and control valve do not close.
Role Play	~~ABFP~~ Status: AFW pump ?	21 de-energized 22 bearing oil is drained 23 pump appears normal. Breaker appears normal
Role Play	When NPO dispatched to energize head vent valves at MCC 26A/B	Close breaker for HCV-3100 o MCC 26A Sheet 2 (EPS 18) LOA-EPS431 Close breaker for HCV-3101 o MCC 26B Sheet 2 (EPS 22) LOA-EPS523
	After head vent valves have been opened: Depending upon previous requests from the CCR, perform one of the following: fix the 23 ABFP 480V breaker or align ASSS power to 21 ABFP	Do one of the following to restore a motor driven ABFP: 1. Fix 23 ABFP 480V brkr: Call CCR and request 23 ABFP control switch be placed in pullout to support breaker swap. From the Instructor Station Summary - Delete MOC-AFW002. NPO reports that the 480V breaker for 23 ABFP has been swapped with the spare breaker. Request CCR to attempt to start 23 ABFP. 2. Align ASSS 440V power (SOP-ESP-1, section 4.11) to 21 ABFP: Place EDC5 in "ALT" (Bus 3A P&ID EPS7). Notify CCR. When directed by CCR, close breaker at 12FD3 to start ABFP. (P&ID SWD4 breaker 12FD3-1B)

Event Description: 21 SG Steam Flow Channel B Fails High.		
Time	**Position**	**Examinee's Actions or Behavior**
	BOP/ATC	Diagnose failed instrument
	BOP	Refers to ARPs for alarms
	ATC	Places Channel A in service for 21 SG Steam Flow (will probably switch to the A Channel for Feed Flow as well)
	CRS	Implements 2-AOP-INST-1 • Verifies no other instrument failures • Ensures actions have been taken to stabilize the plant • Refers to Tech Spec Table 3.3.2-1 ***Evaluator Note: If the CRS asks SM if tripping bistables will be performed, inform him that I&C request that bistables be tripped.*** • Directs tripping of bistables
Lead Evaluator		When bistables have been tripped, direct the Booth Instructor to actuate trigger 2. Proceed to the next event when the team diagnoses increased RCP Seal Return Flow.

Event Description:	480V Bus 3A faults. Team responds per AOP-480V-1 to stabilize the plant.	
Time	**Position**	**Examinee's Actions or Behavior**
	BOP/ATC	Diagnose bus 3A de-energized Perform ARPs for associated alarms
	CRS	Implement AOP-480V-1 o Direct actions of RO and BOP o Initiate Attachment 2 o Direct STA to evaluate TS o Determine shutdown is required o Ensure notifications are initiated (OM, WWM, NRC, Power Marketing, etc).
	ATC	Start 21 or 23 Charging pump and adjust speed to match 22 prior to trip. If flashing in letdown line occurs, then first close LCV-459, start a charging pump and re-establish letdown per 2-SOP-3.1
	BOP	Check CCW pumps running and 625 open Check SW pumps Dispatch NPO to monitor EDGs
	CRS	Initiate review of the following TS to determine required actions based on plant conditions: 3.8.1 AC Sources – Operating, Condition H 3.8.9 Distribution Systems – Operating Determine that bus 3A is inoperable, 22 EDG cannot power bus 3A, and 138KV and 13.8KV offsite sources also cannot power bus 3A. 3.8.1 Condition H requires immediate entry into LCO 3.0.3 which requires actions to be initiated within 1 hour to place the unit in mode 3 within 7 hours. Determine 21 ABFP is inoperable and since 22 ABFP pump is also inoperable, per LCO 3.7.5 Condition C: o Be in mode 3 in next six hours ***If desired, CRS can be prompted by Lead Evaluator that the OM has requested that the unit be brought to Mode 3 in 3 hours.***

Event Description:		480V Bus 3A faults. Team responds per AOP-480V-1 to stabilize the plant.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS	Enter Attachment 3 of 2-POP-2.1 Reactor Power Reduction Checklist or Enter 2-AOP-RSD-1 Supervise load reduction
	ATC	Determine shutdown reactivity plan Perform Boration to support load reduction ***Note: BAST will have to be swapped prior to Boration*** Lower Turbine load using the governor
	BOP	Perform actions and peer checks in support of Boration and Turbine load reduction
Lead Evaluator		When load reduction has been performed enough to observe reactivity additions and normal plant evolutions, direct the Booth Instructor to actuate trigger 2. Proceed to the next event when the team diagnoses increased RCP Seal Return Flow.

Event Description:		21 RCP Seal #1 degrades. Rising seal return to about 5.1 gpm. Alarm annunciates at 5 gpm. Team implements AOP-RCP-1. Subsequently, leak rate increases to > 6 gpm requiring trip.
Time	**Position**	**Examinee's Actions or Behavior**
	ATC/BOP	Diagnose rising #1 Seal Return on 21 RCP Perform ARPs for associated alarms o ARP-SF, 1-5, RCP No. 1 SEAL RETURN HIGH LOW FLOW Perform actions as directed by the CRS
	CRS	Implement AOP-RCP-1, Reactor Coolant Pump Malfunction o Direct the actions of the crew o Evaluate RCP trip criteria o Determine a seal malfunction exists o Notify SM that 8 hour shutdown is required o Direct BOP to initiate data collection per Attachment 1
Lead Evaluator		Directs Booth Operator to increase seal leakage to > 6 gpm
	ATC/BOP	Observe rising seal return flow Inform CRS when > 6 gpm
	CRS	Determine IAAT step 4.1 applies with seal return > 6 gpm o Provide team update on plan to trip reactor, stop 21 RCP and close 261A o Direct RO/BOP to trip reactor, stop 21 RCP and close 261A Implement E-0, Reactor Trip or Safety Injection
	ATC/BOP	Trip Reactor Verify Reactor trip Stop 21 RCP When 21 RCP has stopped, Close 261A
Lead Evaluator		Proceed to the next event when the team implements E-0

Event Description:		Turbine upper left stop and control valve don't close requiring MSIVs manually closed. AFW flow cannot be established. Team implements E-0 and transitions to ES-0.1 and then to FR-H.1 and establishes Bleed and Feed.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS	Direct the actions of the crew Direct team to perform immediate actions of E-0 Transition to FR-H.1
	ATC	Checks Reactor tripped Checks Turbine Tripped o Attempts to manually trip turbine o Manually closes all MSIVs Checks SI actuated Attempts to start 23 ABFP - Script turbine valves that don't close stop & control
	BOP	Checks 480V busses 2A, 5A, and 6A energized
EVALUATOR NOTE:		The RO may close MSIVs before Safety Injection occurs. If so, the team will transition to ES-0.1 and then FR-H.1. If auto SI occurs, then the team will go to FR-H.1 from E-0 step 7
	ALL	Determine AFW flow cannot be established and transition to FR-H.1 is required.
	CRS	Implement FR-H.1 Direct the actions of the crew Review Caution Criteria for Bleed and Feed
	ATC/RO	Check RCS pressure > than the highest SG Pressure and RCS temperature > 350 degrees F. Check the average of the three lowest WR SG Levels < 41% o Inform CRS when Bleed and Feed criteria met Bld

Event Description:		Turbine upper left stop and control valve don't close requiring MSIVs manually closed. AFW flow cannot be established. Team implements E-0 and transitions to ES-0.1 and then to FR-H.1 and establishes Bleed and Feed.
Time	**Position**	**Examinee's Actions or Behavior**
Critical Task		WOG CT: FR-H.1--F **Establish RCS bleed and feed when the average of the three lowest SG Levels reach 41% WR**
	CRS	Immediately proceed to step 9 to establish bleed and feed
	BOP/RO	Stop all running RCPs Actuate SI if required
	ATC/BOP	Verify RCS Feed Path • Check SI pumps running • Check SI Valve alignment • Reset SI • Reset Phase A and open 1228
	ATC/BOP	Establish RCS Bleed Path • Check power available to both PORV Block valves • Check both PORV Block Valves open • OPEN both PRZR PORVS (455C will not open) • Dispatch NPO to energize Rx Head Vent Valves at MCC 26A and 26B • Open both Reactor Head Vent Valves
Critical Task		SITE SPECIFIC CT **Open all reactor vessel head vent valves when less than both PORVs are available for RCS bleed path before resetting SI.**

Event Description:		Turbine upper left stop and control valve don't close requiring MSIVs manually closed. AFW flow cannot be established. Team implements E-0 and transitions to ES-0.1 and then to FR-H.1 and establishes Bleed and Feed.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS	Check for available low pressure water source for S/Gs Direct BOP to perform E-0 steps 1-9 Continue attempts to establish secondary heat sink
Booth Instructor After the head vents are open		Depending upon previous requests from the CCR, perform one of the following: fix 23 ABFP 480V breaker or align ASSS power to 21 ABFP 1. Fix 23 ABFP 480V bkr: Request CCR place 23 ABFP control switch to pullout to allow breaker change out. From the Instructor Station Summary - Delete MOC-AFW002. NPO reports that the 480V breaker for 23 ABFP has been swapped with the spare breaker. Request CCR to attempt to start 23 ABFP 2. Align ASSS 440V power to 21 ABFP: Refer to SOP-ESP-1 section 4.11. Place EDC5 in "ALT" (Bus 3A P&ID EPS7). Notify CCR. When directed by CCR, close breaker at 12FD3 to start ABFP. (P&ID SWD4 breaker 12FD3-1B)
	CRS/ATC	Establish AFW flow from 21 or 23 ABFP Observe foldout page criteria for flow restoration Restore NR level in at least one SG to > 10% (27% if adverse VC) Check RCS temperature lowering Close Head Vent Valves
Evaluator Note:		At the lead evaluator's discretion, if the third critical task is required to complete the scenario set, continue until reactor head vent valves are closed. If the third critical task is not required or desired, then the lead evaluator may terminate the scenario after AFW flow is established.
Critical Task		WOG CT: FR-H.1--G **Close all reactor vessel head vent valves before the end of the scenario**

Event Description:		Turbine upper left stop and control valve don't close requiring MSIVs manually closed. AFW flow cannot be established. Team implements E-0 and transitions to ES-0.1 and then to FR-H.1 and establishes Bleed and Feed.
Time	**Position**	**Examinee's Actions or Behavior**
	CRS ATC	Determine if SI pumps can be stopped. When sub-cooling requirements are met: ○ Close PORV ○ Stop SI pump(s)
Lead Evaluator		Terminate the scenario at the discretion of the Lead Evaluator when the appropriate number of critical tasks has been evaluated.