

Final Submittal
(Blue Paper)

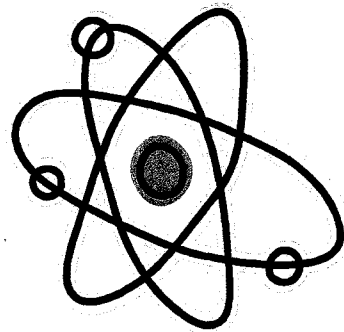
Mc GUIRE MAY 2008-201

FINAL JPMS

1. ADMINISTRATIVE JPMS
2. IN-PLANT JPMS
3. SIMULATOR JPMS (CONTROL ROOM)

NRC Examination JPMs

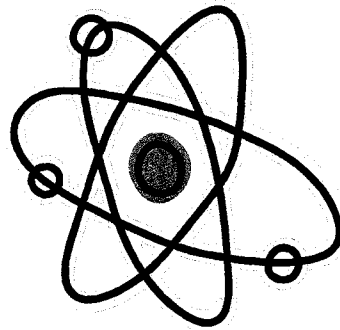
Final Submittal



McGuire Nuclear Station
Final Submittal
April 30, 2008

NRC Examination ADMIN Topics

Final Submittal



McGuire Nuclear Station

Final Submittal

April 30, 2008

Facility: McGuire		Date of Examination: 5/12/08
Examination Level: RO		Operating Test Number: N08-1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R	2.1.25 (3.9) Ability to interpret reference materials, such as graphs, curves, tables, etc.
		JPM: Calculate Dilution Needed for a Specified Rod Change
Conduct of Operations	N, S	2.1.19 (3.9) Ability to use plant computers to evaluate system or component status
		JPM: Monitor Critical Safety Function Status Trees
Equipment Control	N, R	2.2.13 (4.1) Knowledge of Tagging and Clearance Procedures
		JPM: Identify Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump
Emergency Procedures/Plan	M, R	2.4.13 (4.0) Knowledge of Crew Roles and Responsibilities During EOP Usage
		JPM: Calculate Reactor Vessel Head Venting Time
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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)		

RO Admin JPM Summary

- A1a This is a modified JPM using Bank JPM OP-MC-JPM-ADM:214 as its basis. The operator will be given a set of initial conditions and told that it is desired to insert the Bank D Control Rods about 50 steps. The Operator will be given the Core Data Book and asked to manually determine the amount of Reactor Makeup Water that will be necessary to add, to complete the rod height adjustment.
- A1b This is a new JPM. The operator will be told that a plant event has occurred, and that the STA is needed to confirm the proper EAL and classification. The operator will be directed to validate the Critical Safety Function Status Trees (CSFST) per EP/1/A/5000/F-0. The operator will determine that a Valid Orange Path exists on Containment, and Valid Yellow Paths exist on Heat Sink and NC Inventory. The Operator will also determine that the existing Red Path on Subcriticality is invalid and recommend transition to FR-Z.1. This JPM will utilize the Simulator. Although this JPM task is the same as that used on the 2007 NRC Exam, the plant circumstances are entirely different making this a new JPM.
- A2 This is a new JPM. The operator will be placed in a situation where severe a seal leak has just been discovered on the 1B NI Pump, and told that 1NI-149 has a history of seat leakage. The operator will be asked to identify the mechanical and electrical isolation boundaries needed to isolate the 1B NI Pump, including the components, their isolated positions and the sequence in which they are to be manipulated.
- A4 This is a modified JPM using Bank JPM OP-MC-JPM-PS-NC:055 as its basis. The operator will be given a set of NC System and Containment conditions, and a copy of FR-I.1, "Response to Voids in Reactor Vessel." The operator will be asked to calculate maximum head venting time in accordance with Enclosure 1 of FR-1.3.

JPM A1a RO/SRO

Facility: McGuire Task No.: 209MNV002

Task Title: Calculate Dilution Needed for a Specified Rod Change JPM No.: 2008 Admin - JPM A1a RO/SRO

K/A Reference: GK/A 2.1.25 (3.9/4.2)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Unit #1 Reactor Power is at 100%, Steady State.
- Core burnup is 124 EFPD
- NC Boron Concentration = 1000 PPM
- Present Control Rods Bank "D" at 220 steps
- Desired Rod Height is Control Rods Bank "D" at 170 steps

Task Standard: Dilution of approximately **1361 gallons** is calculated within \pm 50 gallons. All critical tasks evaluated as satisfactory.

Required Materials: Calculator

General References: OP/1/A/6150/009, Boron Concentration Control
OP/1/A/6100/22, Unit 1 Data Book

Handouts: OP/1/A/6100/22, Unit 1 Data Book

Initiating Cue: The CRSRO has directed you to manually calculate the minimum amount of reactor makeup water needed to obtain the desired Control Rod Height **using the McGuire Data Book**.

Time Critical Task: NO

Validation Time: 20 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout the Unit 1 Data Book (OP/1/A/6100/22).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Operator determines 220 steps integral rod worth using the 51-125 EFPD column of OP/1/A/6100/22, Enclosure 4.3, Table 6.3.3, IRW in Overlap, HFP, Equilibrium Xe.	Initial inserted reactivity worth = <u>5 pcm</u>		
*2	Operator determines 170 steps integral rod worth using the 51-125 EFPD column of OP/1/A/6100/22, Enclosure 4.3, Table 6.3.3, IRW in Overlap, HFP, Equilibrium Xe.	Desired Rod height inserted reactivity worth = <u>130 pcm</u>		
*3	Operator determines the change in reactivity required for the rod insertion	Change in reactivity to be compensated to rod insertion = 130 pcm <u>-5 pcm</u> 125 pcm		
*4	Using OP/1/A/6100/22, Enclosure 4.3, Graph 6.11 Differential Boron Worth (HFP, ARO, Eq Xe, Eq Sm) determines the Differential Boron Worth for present conditions (124 EFPD)	Operator determines the Differential Boron Worth from the graph to be = <u>-6.31 pcm/ppm</u>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Using the Differential Boron Worth and the Change in reactivity, determines the change in Boron Concentration	Operator determines the change in Boron Concentration to be = <u>125 / -6.31 pcm/ppm</u> = <u>-19.8 ppm</u>		
6	Operator determines Boron Concentration change required	Change in Boron = <u>1000 - 19.8 ppm</u> = <u>980.2 ppm</u>		
*7	Using OP/1/A/6100/22, Enclosure 4.3 Section 5.1 Boron and Dilution Tables, determines the Reactor Makeup Water addition	Using Present Boron Concentration 1000 ppm and the Desired Boron Concentration of 980 ppm, determines from Table that change from 1000-980 ppm will require the addition of <u>1361 ± 50 gallons</u> of reactor makeup water. Total Makeup Water to add = <u>1361 ± 50 gallons.</u>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A1a RO/SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit #1 Reactor Power is at 100%, Steady State.
- Core burnup is 124 EFPD
- NC Boron Concentration = 1000 PPM
- Present Control Rods Bank "D" at 220 steps
- Desired Rod Height is Control Rods Bank "D" at 170 steps

INITIATING CUE:

The CRSRO has directed you to manually calculate the minimum amount of reactor makeup water needed to obtain the desired Control Rod Height **using the McGuire Data Book.**

UNIT 1

UP/D/06100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon

chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD	51 - 125 EFPD	126 - 175 EFPD	176 - 250 EFPD	251 - 325 EFPD	326 - 400 EFPD	401 - EOW
Bk A	Bk B	Bk C	Bk D	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)
226	226	226	226	0	0	0	0	0	0	0
226	226	226	225	1	1	1	1	1	2	2
226	226	226	220	7	5	5	6	8	10	13
226	226	226	215	14	10	10	12	15	18	23
226	226	226	210	20	14	14	17	22	26	34
226	226	226	205	36	27	28	31	40	45	56
226	226	226	200	52	39	41	46	57	64	78
226	226	226	195	67	52	54	60	74	83	100
226	226	226	190	83	65	67	74	91	102	122
226	226	226	185	101	81	84	92	111	123	145
226	226	226	180	119	97	100	109	131	144	168
226	226	226	175	137	113	117	127	151	165	191
226	226	226	170	155	130	133	144	171	186	214
	226	226	165	173	147	150	161	190	205	235
	226	226	160	191	164	167	179	209	224	255
226	226	226	155	209	181	184	196	227	243	275
226	226	226	150	227	198	201	214	246	263	295
226	226	226	145	244	215	217	230	263	280	312
226	226	226	140	262	231	234	247	280	297	330
226	226	226	135	279	248	250	263	297	314	348
226	226	226	130	297	265	267	280	314	331	365
226	226	226	125	314	281	283	295	329	346	381
226	226	226	120	331	298	299	311	345	362	397
226	226	226	116	345	311	312	324	357	374	410
226	226	226	110	365	331	331	342	375	392	427
226	226	221	105	388	351	350	361	396	414	453
226	226	216	100	410	371	370	381	417	436	478
226	226	211	95	446	402	401	413	454	476	523
226	226	206	90	481	434	433	446	491	515	567
226	226	201	85	517	465	464	478	528	555	612

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OPTI/NO1000ZZ
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon

Chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD	51 - 125 EFPD	126 - 175 EFPD	176 - 250 EFPD	251 - 325 EFPD	326 - 400 EFPD	401 - EOW
Bk A	Bk B	Bk C	Bk D	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)
226	226	196	80	553	496	496	511	564	594	656
226	226	191	75	592	535	535	552	610	642	707
226	226	186	70	631	573	575	593	656	689	758
226	226	181	65	670	612	614	634	701	737	809
226	226	176	60	709	650	654	676	747	784	860
226	226	171	55	750	693	697	720	794	832	909
226	226	166	50	791	735	740	764	840	880	958
226	226	161	45	832	777	783	808	887	927	1007
226	226	156	40	873	820	826	853	934	975	1056
226	226	151	35	916	863	870	897	980	1021	1102
226	226	146	30	959	907	914	942	1026	1068	1149
226	226	141	25	1002	951	958	987	1073	1114	1196
226	226	136	20	1045	994	1002	1032	1119	1161	1243
	226	131	15	1083	1033	1041	1071	1158	1200	1283
	226	126	10	1121	1072	1080	1110	1198	1240	1323
226	226	121	5	1158	1110	1119	1149	1237	1279	1363
226	226	116	0	1196	1149	1158	1188	1276	1319	1403
226	226	110	0	1228	1187	1197	1227	1313	1355	1439
226	221	105	0	1258	1220	1230	1260	1348	1390	1476
226	216	100	0	1288	1254	1264	1294	1382	1425	1514
226	211	95	0	1327	1296	1307	1338	1428	1474	1566
226	206	90	0	1366	1338	1350	1382	1475	1522	1619
226	201	85	0	1405	1379	1393	1425	1521	1570	1672
226	196	80	0	1444	1421	1436	1469	1568	1618	1724
226	191	75	0	1487	1469	1486	1520	1622	1674	1782
226	186	70	0	1530	1518	1535	1571	1675	1729	1840
226	181	65	0	1572	1566	1585	1622	1729	1784	1898
226	176	60	0	1615	1614	1635	1673	1783	1839	1956
226	171	55	0	1662	1666	1689	1729	1840	1897	2014
226	166	50	0	1708	1719	1744	1785	1897	1954	2072

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OP/17A/6100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon

chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD IRW (PCM)	51 - 125 EFPD IRW (PCM)	126 - 175 EFPD IRW (PCM)	176 - 250 EFPD IRW (PCM)	251 - 325 EFPD IRW (PCM)	326 - 400 EFPD IRW (PCM)	401 - EOW IRW (PCM)
Bk A	Bk B	Bk C	Bk D							
226	161	45	0	1755	1771	1798	1840	1954	2012	2130
226	156	40	0	1802	1823	1853	1896	2011	2069	2188
226	151	35	0	1851	1876	1907	1952	2068	2127	2246
226	146	30	0	1901	1929	1961	2008	2125	2185	2304
226	141	25	0	1951	1981	2016	2064	2183	2242	2362
226	136	20	0	2000	2034	2070	2120	2240	2300	2420
226	131	15	0	2044	2076	2113	2163	2285	2346	2467
226	126	10	0	2088	2118	2155	2206	2330	2392	2514
226	121	5	0	2131	2160	2198	2250	2375	2437	2560
226	116	0	0	2175	2202	2240	2293	2421	2483	2607
226	110	0	0	2202	2233	2273	2326	2454	2518	2643
221	105	0	0	2228	2262	2302	2356	2486	2550	2678
216	100	0	0	2254	2291	2331	2386	2518	2583	2714
211	95	0	0	2290	2327	2369	2425	2559	2626	2759
	90	0	0	2325	2364	2407	2464	2601	2669	2805
	85	0	0	2360	2401	2445	2503	2642	2711	2851
196	80	0	0	2396	2438	2483	2542	2684	2754	2897
191	75	0	0	2434	2480	2527	2587	2731	2802	2945
186	70	0	0	2473	2523	2571	2632	2778	2850	2994
181	65	0	0	2512	2565	2615	2677	2824	2897	3043
176	60	0	0	2550	2607	2658	2722	2871	2945	3092
171	55	0	0	2591	2652	2705	2770	2920	2993	3140
166	50	0	0	2632	2697	2752	2818	2968	3042	3188
161	45	0	0	2673	2742	2798	2866	3017	3090	3236
156	40	0	0	2714	2787	2845	2914	3065	3139	3284
151	35	0	0	2755	2829	2889	2959	3111	3185	3329
146	30	0	0	2796	2872	2932	3003	3157	3231	3375
141	25	0	0	2838	2915	2976	3048	3203	3277	3421
136	20	0	0	2879	2957	3020	3093	3249	3323	3466
131	15	0	0	2913	2989	3051	3125	3280	3354	3498

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

Enclosure 4.3 - Table 6.3.3
Integral Rod Worth in Overlap
HFP, Equilibrium Xenon

Chg A/H

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD IRW (PCM)	51 - 125 EFPD IRW (PCM)	126 - 175 EFPD IRW (PCM)	176 - 250 EFPD IRW (PCM)	251 - 325 EFPD IRW (PCM)	326 - 400 EFPD IRW (PCM)	401 - EOW IRW (PCM)
Bk A	Bk B	Bk C	Bk D							
126	10	0	0	2947	3020	3083	3156	3312	3386	3530
121	5	0	0	2981	3052	3114	3187	3343	3417	3562
116	0	0	0	3015	3083	3145	3219	3375	3448	3594
110	0	0	0	3036	3106	3167	3240	3394	3468	3612
105	0	0	0	3052	3123	3185	3257	3410	3482	3627
100	0	0	0	3069	3141	3202	3273	3425	3497	3641
95	0	0	0	3085	3159	3219	3290	3439	3511	3654
90	0	0	0	3101	3176	3236	3306	3454	3525	3668
85	0	0	0	3117	3194	3253	3322	3469	3540	3681
80	0	0	0	3133	3211	3270	3338	3483	3554	3695
75	0	0	0	3148	3228	3286	3354	3497	3567	3706
70	0	0	0	3163	3244	3303	3369	3510	3579	3718
65	0	0	0	3179	3261	3319	3384	3524	3592	3730
60	0	0	0	3194	3277	3335	3400	3537	3605	3742
	0	0	0	3209	3293	3350	3414	3551	3618	3754
	0	0	0	3225	3309	3366	3429	3564	3631	3765
45	0	0	0	3240	3324	3381	3444	3577	3643	3777
40	0	0	0	3256	3340	3397	3459	3590	3656	3789
35	0	0	0	3271	3354	3410	3472	3603	3668	3800
30	0	0	0	3286	3367	3423	3485	3615	3680	3810
25	0	0	0	3301	3381	3436	3498	3628	3692	3821
20	0	0	0	3317	3394	3450	3512	3640	3704	3832
15	0	0	0	3327	3401	3456	3518	3647	3711	3839
10	0	0	0	3336	3408	3463	3525	3654	3718	3847
5	0	0	0	3346	3414	3469	3532	3661	3724	3854
0	0	0	0	3356	3421	3475	3539	3667	3731	3861

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

OP/1/A/6100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon
 Unit 1 Cycle 19

269 AH

Shutdown Bank Position Bank	SWD	4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
		0 - 50 EFPD IRW (PCM)	51 - 125 EFPD IRW (PCM)	126 - 175 EFPD IRW (PCM)	176 - 250 EFPD IRW (PCM)	251 - 325 EFPD IRW (PCM)	326 - 400 EFPD IRW (PCM)	401 - EOW IRW (PCM)
SDE	226	0	0	0	0	0	0	0
	220	4	5	5	3	5	6	6
	200	59	47	49	51	65	73	87
	0	756	747	747	744	751	757	773
SDD	226	0	0	0	0	0	0	0
	220	4	5	4	5	6	6	7
	200	55	45	45	51	64	72	88
	0	692	730	749	770	809	826	855
SDC	226	0	0	0	0	0	0	0
	220	4	4	3	4	6	6	7
	200	59	48	48	55	70	79	96
	0	773	822	848	872	917	934	960
SDB	226	0	0	0	0	0	0	0
	220	6	5	5	6	7	8	11
	200	85	68	72	80	103	115	142
	0	1238	1225	1238	1258	1308	1334	1387
SDA	226	0	0	0	0	0	0	0
	220	1	1	1	1	2	3	5
	200	24	20	21	25	37	44	63
	0	377	346	358	387	474	527	649

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	10	20	30	40	50	60	70	80	90	100	110
10	0	46710	74033	93420	108457	120743	131131	140129	148067	155167	161589
20	96	0	27323	46710	61747	74033	84421	93420	101357	108457	114880
30	193	97	0	19386	34424	46710	57098	66096	74033	81133	87556
40	290	193	97	0	15037	27323	37711	46710	54647	61747	68170
50	387	290	194	97	0	12286	22674	31673	39610	46710	53133
60	484	387	291	194	97	0	10388	19386	27323	34424	40846
70	581	484	388	291	194	97	0	8998	16936	24036	30458
80	678	582	485	388	292	194	97	0	7937	15037	21460
90	776	679	583	486	389	292	195	97	0	7100	13523
100	873	777	680	583	487	390	292	195	98	0	6423
110	971	875	778	681	584	487	390	293	195	98	0
120	1069	972	876	779	682	585	488	391	293	196	98
130	1167	1070	974	877	780	683	586	489	391	294	196
140	1265	1169	1072	975	788	781	684	587	489	392	294
150	1363	1267	1170	1074	977	880	782	685	588	490	392
160	1462	1365	1269	1172	1075	978	881	784	686	589	491
170	1560	1464	1367	1271	1174	1077	979	882	785	687	589
180	1659	1563	1466	1369	1272	1175	1078	981	883	786	688
190	1758	1662	1565	1468	1371	1274	1177	1080	982	885	787
200	1857	1761	1664	1567	1470	1373	1276	1179	1081	984	886
210	1956	1860	1763	1666	1570	1472	1375	1278	1181	1083	985
220	2056	1959	1862	1766	1669	1572	1475	1377	1280	1182	1085
230	2155	2059	1962	1865	1768	1671	1574	1477	1379	1282	1184
240	2255	2158	2062	1965	1868	1771	1674	1576	1479	1381	1284
250	2354	2258	2161	2065	1968	1871	1773	1676	1579	1481	1383
260	2454	2358	2261	2164	2068	1971	1873	1776	1679	1581	1483
270	2554	2458	2361	2265	2168	2071	1973	1876	1779	1681	1583
280	2655	2558	2461	2365	2268	2171	2074	1976	1879	1781	1684
290	2755	2658	2562	2465	2368	2271	2174	2077	1979	1882	1784
300	2855	2759	2662	2566	2469	2372	2274	2177	2080	1982	1884
310	2956	2860	2763	2666	2569	2472	2375	2278	2180	2083	1985
320	3057	2960	2864	2767	2670	2573	2476	2379	2281	2184	2086
330	3158	3061	2965	2868	2771	2674	2577	2480	2382	2285	2187
340	3259	3162	3066	2969	2872	2775	2678	2581	2483	2386	2288
350	3360	3264	3167	3070	2973	2876	2779	2682	2585	2487	2389
360	3462	3365	3269	3172	3075	2978	2881	2783	2686	2588	2491
370	3563	3467	3370	3273	3176	3079	2982	2885	2787	2690	2592
380	3665	3568	3472	3375	3278	3181	3084	2987	2889	2792	2694
390	3767	3670	3574	3477	3380	3283	3186	3089	2991	2893	2796
400	3869	3772	3676	3579	3482	3385	3288	3191	3093	2996	2898
410	3971	3875	3778	3681	3584	3487	3390	3293	3195	3098	3000
420	4073	3977	3880	3783	3687	3590	3492	3395	3298	3200	3102
430	4176	4079	3983	3886	3789	3692	3595	3498	3400	3303	3205
440	4278	4182	4085	3989	3892	3795	3698	3600	3503	3405	3307
450	4381	4285	4188	4091	3995	3898	3800	3703	3606	3508	3410
460	4484	4388	4291	4194	4097	4000	3903	3806	3709	3611	3513
470	4587	4491	4394	4298	4201	4104	4006	3909	3812	3714	3616
480	4691	4594	4498	4401	4304	4207	4110	4012	3915	3817	3720
490	4794	4698	4601	4504	4407	4310	4213	4116	4018	3921	3823
500	4898	4801	4705	4608	4511	4414	4317	4219	4122	4024	3927

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	100	110	120	130	140	150	160	170	180	190	200
10	155167	161589	167453	172847	177841	182490	186839	190925	194776	198420	201876
20	108457	114880	120743	126137	131131	135780	140129	144215	148067	151710	155167
30	81133	87556	93420	98814	103808	108457	112806	116891	120743	124387	127843
40	61747	68170	74033	79427	84421	89070	93420	97505	101357	105000	108457
50	46710	53133	58996	64390	69384	74033	78382	82468	86320	89963	93420
60	34424	40846	46710	52104	57098	61747	66096	70181	74033	77677	81133
70	24036	30458	36322	41716	46710	51359	55708	59794	63645	67289	70745
80	15037	21460	27323	32717	37711	42361	46710	50795	54647	58290	61747
90	7100	13523	19386	24780	29774	34424	38773	42858	46710	50353	53810
100	0	6423	12286	17680	22674	27323	31673	35758	39610	43253	46710
110	98	0	5864	11257	16251	20901	25250	29335	33187	36830	40287
120	196	98	0	5394	10388	15037	19386	23472	27323	30967	34424
130	294	196	98	0	4994	9643	13992	18078	21930	25573	29030
140	392	294	196	98	0	4649	8998	13084	16936	20579	24036
150	490	392	294	196	98	0	4349	8434	12286	15930	19386
160	589	491	393	295	197	98	0	4085	7937	11581	15037
170	687	589	492	394	295	197	99	0	3852	7495	10952
180	786	688	590	492	394	296	197	99	0	3643	7100
190	885	787	689	591	493	395	296	198	99	0	3457
200	984	886	788	690	592	494	395	297	198	99	0
210	1083	985	887	789	691	593	494	396	297	198	99
220	1182	1085	987	889	790	692	594	495	396	298	198
230	1282	1184	1086	988	890	792	693	595	496	397	298
240	1381	1284	1186	1088	990	891	793	694	595	497	398
250	1481	1383	1286	1187	1089	991	893	794	695	596	497
260	1581	1483	1385	1287	1189	1091	992	894	795	696	597
270	1681	1583	1485	1387	1289	1191	1093	994	895	796	697
280	1781	1684	1586	1488	1389	1291	1193	1094	895	796	697
290	1882	1784	1686	1588	1490	1392	1293	1195	1096	997	898
300	1982	1884	1787	1689	1590	1492	1394	1295	1196	1097	998
310	2083	1985	1887	1789	1691	1593	1494	1396	1297	1198	1099
320	2184	2086	1988	1890	1792	1694	1595	1496	1398	1299	1200
330	2285	2187	2089	1991	1893	1794	1696	1597	1499	1400	1301
340	2386	2288	2190	2092	1994	1896	1797	1699	1600	1501	1402
350	2487	2389	2291	2193	2095	1997	1898	1800	1701	1602	1503
360	2588	2491	2393	2295	2197	2098	2000	1901	1802	1704	1605
370	2690	2592	2494	2396	2298	2200	2101	2003	1904	1805	1706
380	2792	2694	2596	2498	2400	2302	2203	2104	2006	1907	1808
390	2893	2796	2698	2600	2502	2403	2305	2206	2108	2009	1910
400	2996	2898	2800	2702	2604	2505	2407	2308	2210	2111	2012
410	3098	3000	2902	2804	2706	2608	2509	2411	2312	2213	2114
420	3200	3102	3004	2906	2808	2710	2611	2513	2414	2315	2216
430	3303	3205	3107	3009	2911	2812	2714	2615	2517	2418	2319
440	3405	3307	3210	3112	3013	2915	2817	2718	2619	2520	2421
450	3508	3410	3312	3214	3116	3018	2919	2821	2722	2623	2524
460	3611	3513	3415	3317	3219	3121	3022	2924	2825	2726	2627
470	3714	3616	3518	3420	3322	3224	3126	3027	2928	2829	2730
480	3817	3720	3622	3524	3426	3327	3229	3130	3031	2933	2834
490	3921	3823	3725	3627	3529	3431	3332	3234	3135	3036	2937
500	4024	3927	3829	3731	3633	3534	3436	3337	3238	3140	3041

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	200	210	220	230	240	250	260	270	280	290	300
10	201876	205164	208299	211295	214163	216914	219557	222100	224551	226915	229200
20	155167	158454	161589	164585	167453	170204	172847	175390	177841	180206	182490
30	127843	131131	134266	137261	140129	142880	145523	148067	150517	152882	155167
40	108457	111745	114880	117875	120743	123494	126137	128680	131131	133496	135780
50	93420	96707	99842	102838	105706	108457	111100	113643	116094	118459	120743
60	81133	84421	87556	90552	93420	96171	98814	101357	103808	106172	108457
70	70745	74033	77168	80164	83032	85783	88426	90969	93420	95784	98069
80	61747	65035	68170	71165	74033	76784	79427	81970	84421	86786	89070
90	53810	57098	60233	63228	66096	68847	71490	74033	76484	78849	81133
100	46710	49998	53133	56128	58996	61747	64390	66933	69384	71749	74033
110	40287	43575	46710	49705	52573	55324	57967	60510	62961	65326	67611
120	34424	37711	40846	43842	46710	49461	52104	54647	57098	59462	61747
130	29030	32317	35452	38448	41316	44067	46710	49253	51704	54069	56353
140	24036	27323	30458	33454	36322	39073	41716	44259	46710	49075	51359
150	19386	22674	25809	28805	31673	34424	37067	39610	42061	44425	46710
160	15037	18325	21460	24455	27323	30074	32717	35261	37711	40076	42361
170	10952	14240	17375	20370	23238	25989	28632	31175	33626	35991	38275
180	7100	10388	13523	16518	19386	22137	24780	27323	29774	32139	34424
190	3457	6744	9879	12875	15743	18494	21137	23680	26131	28495	30780
200	0	3288	6423	9418	12286	15037	17680	20223	22674	25039	27323
210	99	0	3135	6130	8998	11749	14392	16936	19386	21751	24036
220	198	99	0	2996	5864	8614	11257	13801	16251	18616	20901
230	298	199	99	0	2868	5619	8262	10805	13256	15621	17905
240	398	298	199	100	0	2751	5394	7937	10388	12753	15037
250	497	398	299	199	100	0	2643	5186	7637	10002	12286
260	597	498	399	299	200	100	0	2543	4994	7359	9643
270	697	598	499	399	300	200	100	0	2451	4815	7100
280	798	698	599	500	400	300	200	100	0	2365	4649
290	898	799	699	600	500	401	301	201	100	0	2285
300	998	899	800	700	601	501	401	301	201	101	0
310	1099	1000	901	801	701	602	502	402	302	201	101
320	1200	1101	1001	902	802	702	603	503	402	302	201
330	1301	1202	1102	1003	903	803	704	603	503	403	302
340	1402	1303	1203	1104	1004	905	805	705	604	504	404
350	1503	1404	1305	1205	1106	1006	906	806	706	605	505
360	1605	1505	1406	1307	1207	1107	1007	907	807	707	606
370	1706	1607	1508	1408	1309	1209	1109	1009	909	808	708
380	1808	1709	1609	1510	1410	1311	1211	1111	1010	910	809
390	1910	1811	1711	1612	1512	1412	1312	1212	1112	1012	911
400	2012	1913	1813	1714	1614	1514	1414	1314	1214	1114	1013
410	2114	2015	1915	1816	1716	1617	1517	1417	1316	1216	1116
420	2216	2117	2018	1918	1819	1719	1619	1519	1419	1318	1218
430	2319	2220	2120	2021	1921	1821	1722	1621	1521	1421	1320
440	2421	2322	2223	2123	2024	1924	1824	1724	1624	1524	1423
450	2524	2425	2326	2226	2127	2027	1927	1827	1727	1626	1526
460	2627	2528	2429	2329	2230	2130	2030	1930	1830	1729	1629
470	2730	2631	2532	2432	2333	2233	2133	2033	1933	1832	1732
480	2834	2734	2635	2536	2436	2336	2236	2136	2036	1936	1835
490	2937	2838	2738	2639	2539	2440	2340	2240	2139	2039	1939
500	3041	2941	2842	2743	2643	2543	2443	2343	2243	2143	2042

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	300	310	320	330	340	350	360	370	380	390	400
110	67611	69820	71960	74033	76045	77998	79897	81743	83540	85291	86997
120	61747	63957	66096	68170	70181	72135	74033	75880	77677	79427	81133
130	56353	58563	60702	62776	64788	66741	68639	70486	72283	74033	75739
140	51359	53569	55708	57782	59794	61747	63645	65492	67289	69039	70745
150	46710	48919	51059	53133	55144	57098	58996	60842	62640	64390	66096
160	42361	44570	46710	48783	50795	52749	54647	56493	58290	60041	61747
170	38275	40485	42624	44698	46710	48663	50562	52408	54205	55956	57662
180	34424	36633	38773	40846	42858	44811	46710	48556	50353	52104	53810
190	30780	32990	35129	37203	39215	41168	43066	44913	46710	48460	50166
200	27323	29533	31673	33746	35758	37711	39610	41456	43253	45004	46710
210	24036	26245	28385	30458	32470	34424	36322	38168	39965	41716	43422
220	20901	23110	25250	27323	29335	31289	33187	35033	36830	38581	40287
230	17905	20115	22254	24328	26340	28293	30191	32038	33835	35585	37292
240	15037	17247	19386	21460	23472	25425	27323	29170	30967	32717	34424
250	12286	14496	16635	18709	20721	22674	24573	26419	28216	29966	31673
260	9643	11853	13992	16066	18078	20031	21930	23776	25573	27323	29030
270	7100	9310	11449	13523	15535	17488	19386	21233	23030	24780	26486
280	4649	6859	8998	11072	13084	15037	16936	18782	20579	22329	24036
290	2285	4494	6634	8707	10719	12672	14571	16417	18214	19965	21671
300	0	2210	4349	6423	8434	10388	12286	14133	15930	17680	19386
310	101	0	2139	4213	6225	8178	10077	11923	13720	15471	17177
320	201	101	0	2074	4085	6039	7937	9784	11581	13331	15037
330	302	202	101	0	2012	3965	5864	7710	9507	11257	12964
340	404	303	202	101	0	1953	3852	5698	7495	9246	10952
350	505	404	303	202	101	0	1898	3745	5542	7292	8998
360	606	506	405	304	203	101	0	1846	3643	5394	7100
370	708	607	506	405	304	203	102	0	1797	3548	5254
380	809	709	608	507	406	305	203	102	0	1750	3457
390	911	811	710	609	508	407	305	204	102	0	1706
400	1013	913	812	711	610	509	407	306	204	102	0
410	1116	1015	914	813	712	611	509	408	306	204	102
420	1218	1117	1016	915	814	713	612	510	408	307	205
430	1320	1220	1119	1018	917	816	714	613	511	409	307
440	1423	1322	1222	1121	1020	918	817	715	614	512	410
450	1526	1425	1324	1223	1122	1021	920	818	716	614	512
460	1629	1528	1427	1326	1225	1124	1023	921	819	717	615
470	1732	1631	1530	1429	1328	1227	1126	1024	922	821	719
480	1835	1735	1634	1533	1432	1330	1229	1127	1026	924	822
490	1939	1838	1737	1636	1535	1434	1332	1231	1129	1027	925
500	2042	1942	1841	1740	1639	1537	1436	1334	1233	1131	1029
510	2146	2045	1945	1844	1742	1641	1540	1438	1336	1235	1133
520	2250	2149	2048	1947	1846	1745	1644	1542	1440	1339	1237
530	2354	2253	2152	2052	1950	1849	1748	1646	1544	1443	1341
540	2458	2358	2257	2156	2055	1953	1852	1750	1649	1547	1445
550	2563	2462	2361	2260	2159	2058	1956	1855	1753	1651	1549
560	2667	2566	2466	2365	2264	2162	2061	1959	1858	1756	1654
570	2772	2671	2570	2469	2368	2267	2166	2064	1962	1861	1758
580	2877	2776	2675	2574	2473	2372	2271	2169	2067	1965	1863
590	2982	2881	2780	2679	2578	2477	2376	2274	2172	2070	1968
600	3087	2986	2886	2785	2683	2582	2481	2379	2278	2176	2074

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22
Enclosure 4.3
Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	400	410	420	430	440	450	460	470	480	490	500
210	43422	45086	46710	48295	49845	51359	52840	54289	55708	57098	58459
220	40287	41951	43575	45161	46710	48224	49705	51155	52573	53963	55324
230	37292	38956	40579	42165	43714	45229	46710	48159	49578	50967	52329
240	34424	36088	37711	39297	40846	42361	43842	45291	46710	48099	49461
250	31673	33337	34960	36546	38095	39610	41091	42540	43959	45348	46710
260	29030	30694	32317	33903	35452	36967	38448	39897	41316	42705	44067
270	26486	28150	29774	31360	32909	34424	35905	37354	38773	40162	41524
280	24036	25700	27323	28909	30458	31973	33454	34903	36322	37711	39073
290	21671	23335	24959	26544	28094	29608	31089	32538	33957	35347	36708
300	19386	21050	22674	24260	25809	27323	28805	30254	31673	33062	34424
310	17177	18841	20465	22050	23599	25114	26595	28044	29463	30852	32214
320	15037	16701	18325	19911	21460	22974	24455	25905	27323	28713	30074
330	12964	14628	16251	17837	19386	20901	22382	23831	25250	26639	28001
340	10952	12616	14240	15825	17375	18889	20370	21819	23238	24628	25989
350	8998	10662	12286	13872	15421	16936	18417	19866	21285	22674	24036
360	7100	8764	10388	11974	13523	15037	16518	17968	19386	20776	22137
370	5254	6918	8542	10127	11676	13191	14672	16121	17540	18929	20291
380	3457	5121	6744	8330	9879	11394	12875	14324	15743	17132	18494
390	1706	3370	4994	6580	8129	9643	11124	12574	13992	15382	16743
400	0	1664	3288	4874	6423	7937	9418	10868	12286	13676	15037
410	102	0	1624	3210	4759	6273	7754	9204	10622	12012	13373
420	205	102	0	1586	3135	4649	6130	7580	8998	10388	11749
430	307	205	102	0	1549	3064	4545	5994	7413	8802	10164
440	410	307	205	103	0	1514	2996	4445	5864	7253	8614
450	512	410	308	205	103	0	1481	2930	4349	5739	7100
460	615	513	411	308	206	103	0	1449	2868	4257	5619
470	719	616	514	412	309	206	103	0	1419	2808	4170
480	822	720	617	515	412	309	206	103	0	1389	2751
490	925	823	721	618	516	413	310	207	103	0	1361
500	1029	927	824	722	619	516	413	310	207	104	0
510	1133	1030	928	826	723	620	517	414	311	207	104
520	1237	1134	1032	930	827	724	621	518	415	311	208
530	1341	1238	1136	1034	931	828	725	622	519	415	312
540	1445	1343	1240	1138	1035	932	829	726	623	520	416
550	1549	1447	1345	1242	1140	1037	934	831	727	624	520
560	1654	1552	1449	1347	1244	1141	1038	935	832	729	625
570	1758	1656	1554	1451	1349	1246	1143	1040	937	833	730
580	1863	1761	1659	1556	1454	1351	1248	1145	1042	938	835
590	1968	1866	1764	1661	1559	1456	1353	1250	1147	1043	940
600	2074	1971	1869	1767	1664	1561	1458	1355	1252	1148	1045
610	2179	2077	1975	1872	1769	1667	1564	1460	1357	1254	1150
620	2285	2182	2080	1978	1875	1772	1669	1566	1463	1359	1256
630	2390	2288	2186	2083	1981	1878	1775	1672	1568	1465	1361
640	2496	2394	2292	2189	2086	1984	1881	1778	1674	1571	1467
650	2602	2500	2398	2295	2193	2090	1987	1884	1780	1677	1573
660	2708	2606	2504	2401	2299	2196	2093	1990	1887	1783	1680
670	2815	2713	2610	2508	2405	2302	2199	2096	1993	1890	1786
680	2921	2819	2717	2614	2512	2409	2306	2203	2099	1996	1892
690	3028	2926	2823	2721	2618	2516	2413	2309	2206	2103	1999
700	3135	3033	2930	2828	2725	2622	2519	2416	2313	2210	2106

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	500	510	520	530	540	550	560	570	580	590	600
310	32214	33548	34857	36141	37400	38637	39851	41044	42216	43368	44500
320	30074	31409	32717	34001	35261	36497	37711	38904	40076	41228	42361
330	28001	29335	30644	31927	33187	34424	35638	36830	38002	39154	40287
340	25989	27323	28632	29916	31175	32412	33626	34819	35991	37143	38275
350	24036	25370	26679	27962	29222	30458	31673	32865	34037	35189	36322
360	22137	23472	24780	26064	27323	28560	29774	30967	32139	33291	34424
370	20291	21625	22934	24217	25477	26714	27928	29121	30293	31445	32577
380	18494	19828	21137	22420	23680	24917	26131	27323	28495	29647	30780
390	16743	18078	19386	20670	21930	23166	24380	25573	26745	27897	29030
400	15037	16372	17680	18964	20223	21460	22674	23867	25039	26191	27323
410	13373	14708	16016	17300	18559	19796	21010	22203	23375	24527	25659
420	11749	13084	14392	15676	16936	18172	19386	20579	21751	22903	24036
430	10164	11498	12807	14090	15350	16586	17801	18993	20165	21317	22450
440	8614	9949	11257	12541	13801	15037	16251	17444	18616	19768	20901
450	7100	8434	9743	11027	12286	13523	14737	15930	17102	18254	19386
460	5619	6953	8262	9546	10805	12042	13256	14449	15621	16773	17905
470	4170	5504	6813	8096	9356	10592	11807	12999	14171	15323	16456
480	2751	4085	5394	6678	7937	9174	10388	11581	12753	13905	15037
490	1361	2696	4004	5288	6548	7784	8998	10191	11363	12515	13648
500	0	1334	2643	3927	5186	6423	7637	8830	10002	11154	12286
510	104	0	1309	2592	3852	5088	6303	7495	8667	9819	10952
520	208	104	0	1284	2543	3780	4994	6187	7359	8511	9643
530	312	208	104	0	1260	2496	3710	4903	6075	7227	8360
540	416	312	208	104	0	1237	2451	3643	4815	5967	7100
550	520	417	313	209	104	0	1214	2407	3579	4731	5864
560	625	521	417	313	209	105	0	1193	2365	3517	4649
570	730	626	522	418	314	209	105	0	1172	2324	3457
580	835	731	627	523	419	314	210	105	0	1152	2285
590	940	836	732	628	524	419	315	210	105	0	1133
600	1045	941	837	733	629	524	420	315	210	105	0
610	1150	1046	943	838	734	630	525	421	316	211	105
620	1256	1152	1048	944	840	735	631	526	421	316	211
630	1361	1258	1154	1050	945	841	736	632	527	422	317
640	1467	1364	1260	1156	1051	947	842	738	633	528	422
650	1573	1470	1366	1262	1157	1053	948	844	739	634	529
660	1680	1576	1472	1368	1264	1159	1055	950	845	740	635
670	1786	1682	1578	1474	1370	1266	1161	1056	951	846	741
680	1892	1789	1685	1581	1476	1372	1268	1163	1058	953	848
690	1999	1895	1791	1687	1583	1479	1374	1270	1165	1060	954
700	2106	2002	1898	1794	1690	1586	1481	1376	1272	1166	1061
710	2213	2109	2005	1901	1797	1693	1588	1483	1379	1274	1168
720	2320	2217	2113	2009	1904	1800	1695	1591	1486	1381	1276
730	2428	2324	2220	2116	2012	1907	1803	1698	1593	1488	1383
740	2535	2432	2328	2224	2119	2015	1910	1806	1701	1596	1490
750	2643	2539	2435	2331	2227	2123	2018	1913	1808	1703	1598
760	2751	2647	2543	2439	2335	2231	2126	2021	1916	1811	1706
770	2859	2755	2651	2547	2443	2339	2234	2129	2024	1919	1814
780	2967	2863	2760	2656	2551	2447	2342	2238	2133	2028	1922
790	3076	2972	2868	2764	2660	2555	2451	2346	2241	2136	2031
800	3184	3081	2977	2873	2768	2664	2559	2455	2350	2245	2139

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	600	610	620	630	640	650	660	670	680	690	700
410	25659	26773	27869	28947	30009	31053	32082	33096	34094	35078	36047
420	24036	25149	26245	27323	28385	29430	30458	31472	32470	33454	34424
430	22450	23564	24660	25738	26799	27844	28873	29886	30884	31868	32838
440	20901	22015	23110	24189	25250	26295	27323	28337	29335	30319	31289
450	19386	20500	21596	22674	23735	24780	25809	26822	27821	28805	29774
460	17905	19019	20115	21193	22254	23299	24328	25341	26340	27323	28293
470	16456	17570	18666	19744	20805	21850	22879	23892	24890	25874	26844
480	15037	16151	17247	18325	19386	20431	21460	22473	23472	24455	25425
490	13648	14762	15857	16936	17997	19042	20070	21084	22082	23066	24036
500	12286	13400	14496	15574	16635	17680	18709	19722	20721	21705	22674
510	10952	12066	13161	14240	15301	16346	17375	18388	19386	20370	21340
520	9643	10757	11853	12931	13992	15037	16066	17079	18078	19062	20031
530	8360	9474	10569	11648	12709	13754	14782	15796	16794	17778	18748
540	7100	8214	9310	10388	11449	12494	13523	14536	15535	16518	17488
550	5864	6977	8073	9151	10213	11257	12286	13300	14298	15282	16251
560	4649	5763	6859	7937	8998	10043	11072	12085	13084	14068	15037
570	3457	4570	5666	6744	7806	8850	9879	10893	11891	12875	13844
580	2285	3398	4494	5572	6634	7678	8707	9721	10719	11703	12672
590	1133	2246	3342	4420	5482	6527	7555	8569	9567	10551	11521
600	0	1114	2210	3288	4349	5394	6423	7436	8434	9418	10388
610	105	0	1096	2174	3235	4280	5309	6322	7321	8304	9274
620	211	106	0	1078	2139	3184	4213	5226	6225	7209	8178
630	317	211	106	0	1061	2106	3135	4148	5147	6130	7100
640	422	317	212	106	0	1045	2074	3087	4085	5069	6039
650	529	423	318	212	106	0	1029	2042	3041	4024	4994
660	635	529	424	318	212	106	0	1013	2012	2996	3965
670	741	636	530	424	319	213	106	0	998	1982	2952
680	848	742	637	531	425	319	213	107	0	984	1953
690	954	849	743	638	532	426	320	213	107	0	970
700	1061	956	850	745	639	533	427	320	214	107	0
710	1168	1063	957	852	746	640	534	427	321	214	107
720	1276	1170	1065	959	853	747	641	534	428	321	214
730	1383	1278	1172	1066	960	854	748	642	535	429	322
740	1490	1385	1280	1174	1068	962	856	749	643	536	429
750	1598	1493	1387	1282	1176	1070	963	857	751	644	537
760	1706	1601	1495	1389	1284	1178	1071	965	858	752	645
770	1814	1709	1603	1498	1392	1286	1179	1073	967	860	753
780	1922	1817	1712	1606	1500	1394	1288	1181	1075	968	861
790	2031	1926	1820	1714	1608	1502	1396	1290	1183	1077	970
800	2139	2034	1929	1823	1717	1611	1505	1398	1292	1185	1078
810	2248	2143	2037	1932	1826	1720	1614	1507	1401	1294	1187
820	2357	2252	2146	2041	1935	1829	1722	1616	1510	1403	1296
830	2466	2361	2255	2150	2044	1938	1832	1725	1619	1512	1405
840	2576	2470	2365	2259	2153	2047	1941	1835	1728	1621	1514
850	2685	2580	2474	2369	2263	2157	2050	1944	1837	1731	1624
860	2795	2689	2584	2478	2372	2266	2160	2054	1947	1840	1734
870	2905	2799	2694	2588	2482	2376	2270	2164	2057	1950	1843
880	3015	2909	2804	2698	2592	2486	2380	2274	2167	2060	1953
890	3125	3019	2914	2808	2702	2596	2490	2384	2277	2170	2064
900	3235	3130	3024	2919	2813	2707	2601	2494	2388	2281	2174

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	700	710	720	730	740	750	760	770	780	790	800
510	21340	22296	23238	24168	25084	25989	26882	27762	28632	29490	30338
520	20031	20987	21930	22859	23776	24680	25573	26454	27323	28182	29030
530	18748	19703	20646	21575	22492	23397	24289	25170	26040	26898	27746
540	17488	18444	19386	20316	21233	22137	23030	23911	24780	25639	26486
550	16251	17207	18150	19079	19996	20901	21793	22674	23544	24402	25250
560	15037	15993	16936	17865	18782	19686	20579	21460	22329	23188	24036
570	13844	14800	15743	16672	17589	18494	19386	20267	21137	21995	22843
580	12672	13628	14571	15500	16417	17322	18214	19095	19965	20823	21671
590	11521	12476	13419	14348	15265	16170	17062	17943	18813	19671	20519
600	10388	11344	12286	13216	14133	15037	15930	16811	17680	18539	19386
610	9274	10230	11172	12102	13019	13923	14816	15697	16566	17425	18272
620	8178	9134	10077	11006	11923	12828	13720	14601	15471	16329	17177
630	7100	8056	8998	9928	10845	11749	12642	13523	14392	15251	16098
640	6039	6995	7937	8867	9784	10688	11581	12462	13331	14190	15037
650	4994	5950	6892	7822	8739	9643	10536	11417	12286	13145	13992
660	3965	4921	5864	6793	7710	8614	9507	10388	11257	12116	12964
670	2952	3908	4850	5780	6697	7601	8494	9375	10244	11103	11950
680	1953	2909	3852	4781	5698	6603	7495	8376	9246	10104	10952
690	970	1926	2868	3798	4714	5619	6511	7392	8262	9120	9968
700	0	956	1898	2828	3745	4649	5542	6423	7292	8151	8998
710	107	0	943	1872	2789	3693	4586	5467	6336	7195	8043
720	214	107	0	930	1846	2751	3643	4524	5394	6252	7100
730	322	215	107	0	917	1821	2714	3595	4464	5323	6171
740	429	322	215	108	0	905	1797	2678	3548	4406	5254
750	537	430	323	215	108	0	893	1773	2643	3501	4349
760	645	538	431	323	216	108	0	881	1750	2609	3457
770	753	646	539	431	324	216	108	0	870	1728	2576
780	861	754	647	540	432	324	216	108	0	858	1706
790	970	863	755	648	540	433	325	217	108	0	848
800	1078	971	864	757	649	541	433	325	217	109	0
810	1187	1080	973	865	758	650	542	434	326	217	109
820	1296	1189	1082	974	867	759	651	543	435	326	218
830	1405	1298	1191	1083	976	868	760	652	544	435	327
840	1514	1407	1300	1193	1085	977	870	761	653	545	436
850	1624	1517	1410	1302	1195	1087	979	871	763	654	546
860	1734	1626	1519	1412	1304	1197	1089	981	872	764	655
870	1843	1736	1629	1522	1414	1306	1199	1090	982	874	765
880	1953	1846	1739	1632	1524	1416	1309	1200	1092	984	875
890	2064	1957	1849	1742	1634	1527	1419	1311	1202	1094	985
900	2174	2067	1960	1852	1745	1637	1529	1421	1313	1204	1096
910	2285	2178	2070	1963	1855	1748	1640	1532	1423	1315	1206
920	2395	2288	2181	2074	1966	1858	1750	1642	1534	1426	1317
930	2506	2399	2292	2185	2077	1969	1861	1753	1645	1537	1428
940	2617	2510	2403	2296	2188	2080	1972	1864	1756	1648	1539
950	2729	2622	2514	2407	2299	2192	2084	1976	1867	1759	1650
960	2840	2733	2626	2518	2411	2303	2195	2087	1979	1870	1762
970	2952	2845	2738	2630	2523	2415	2307	2199	2091	1982	1874
980	3064	2957	2849	2742	2634	2527	2419	2311	2202	2094	1985
990	3176	3069	2961	2854	2746	2639	2531	2423	2314	2206	2097
1000	3288	3181	3074	2966	2859	2751	2643	2535	2427	2318	2210

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	800	810	820	830	840	850	860	870	880	890	900
610	18272	19110	19936	20753	21560	22358	23146	23925	24695	25457	26210
620	17177	18014	18841	19657	20465	21262	22050	22829	23599	24361	25114
630	16098	16936	17762	18579	19386	20184	20972	21751	22521	23283	24036
640	15037	15874	16701	17518	18325	19123	19911	20690	21460	22221	22974
650	13992	14830	15656	16473	17280	18078	18866	19645	20415	21177	21930
660	12964	13801	14628	15444	16251	17049	17837	18616	19386	20148	20901
670	11950	12787	13614	14431	15238	16036	16824	17603	18373	19134	19887
680	10952	11789	12616	13433	14240	15037	15825	16604	17375	18136	18889
690	9968	10805	11632	12449	13256	14053	14842	15621	16391	17152	17905
700	8998	9836	10662	11479	12286	13084	13872	14651	15421	16183	16936
710	8043	8880	9707	10523	11330	12128	12916	13695	14465	15227	15980
720	7100	7937	8764	9581	10388	11185	11974	12753	13523	14284	15037
730	6171	7008	7835	8651	9458	10256	11044	11823	12593	13355	14108
740	5254	6091	6918	7734	8542	9339	10127	10906	11676	12438	13191
750	4349	5186	6013	6830	7637	8434	9223	10002	10772	11533	12286
760	3457	4294	5121	5937	6744	7542	8330	9109	9879	10641	11394
770	2576	3413	4240	5056	5864	6661	7449	8228	8998	9760	10513
780	1706	2543	3370	4187	4994	5791	6580	7359	8129	8890	9643
790	848	1685	2512	3328	4136	4933	5721	6500	7270	8032	8785
800	0	837	1664	2481	3288	4085	4874	5653	6423	7184	7937
810	109	0	827	1644	2451	3248	4036	4815	5586	6347	7100
820	218	109	0	817	1624	2421	3210	3989	4759	5520	6273
830	327	218	109	0	807	1605	2393	3172	3942	4703	5456
840	436	327	218	109	0	798	1586	2365	3135	3896	4649
850	546	437	328	219	109	0	788	1567	2337	3099	3852
860	655	547	438	328	219	110	0	779	1549	2311	3064
870	765	656	547	438	329	220	110	0	770	1532	2285
880	875	766	657	548	439	330	220	110	0	761	1514
890	985	877	768	659	549	440	330	220	110	0	753
900	1096	987	878	769	660	550	440	331	221	110	0
910	1206	1098	989	879	770	661	551	441	331	221	111
920	1317	1208	1099	990	881	771	662	552	442	332	221
930	1428	1319	1210	1101	992	882	773	663	553	443	332
940	1539	1430	1321	1212	1103	993	884	774	664	554	443
950	1650	1542	1433	1324	1214	1105	995	885	775	665	555
960	1762	1653	1544	1435	1326	1216	1107	997	887	776	666
970	1874	1765	1656	1547	1437	1328	1218	1108	998	888	778
980	1985	1877	1768	1659	1549	1440	1330	1220	1110	1000	890
990	2097	1989	1880	1771	1661	1552	1442	1332	1222	1112	1002
1000	2210	2101	1992	1883	1773	1664	1554	1444	1334	1224	1114
1010	2322	2213	2104	1995	1886	1776	1667	1557	1447	1337	1226
1020	2435	2326	2217	2108	1998	1889	1779	1669	1559	1449	1339
1030	2547	2439	2330	2221	2111	2002	1892	1782	1672	1562	1452
1040	2660	2552	2443	2334	2224	2115	2005	1895	1785	1675	1565
1050	2774	2665	2556	2447	2337	2228	2118	2008	1898	1788	1678
1060	2887	2778	2669	2560	2451	2341	2232	2122	2012	1902	1791
1070	3000	2892	2783	2674	2564	2455	2345	2235	2125	2015	1905
1080	3114	3005	2896	2787	2678	2569	2459	2349	2239	2129	2018
1090	3228	3119	3010	2901	2792	2682	2573	2463	2353	2243	2132
1100	3342	3233	3125	3015	2906	2797	2687	2577	2467	2357	2246

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	900	910	920	930	940	950	960	970	980	990	1000
710	15980	16724	17461	18189	18910	19623	20329	21027	21718	22402	23080
720	15037	15782	16518	17247	17968	18681	19386	20085	20776	21460	22137
730	14108	14852	15589	16317	17038	17751	18457	19155	19846	20530	21208
740	13191	13935	14672	15400	16121	16834	17540	18238	18929	19614	20291
750	12286	13031	13767	14496	15217	15930	16635	17334	18025	18709	19386
760	11394	12138	12875	13603	14324	15037	15743	16441	17132	17816	18494
770	10513	11257	11994	12722	13443	14156	14862	15560	16251	16936	17613
780	9643	10388	11124	11853	12574	13287	13992	14691	15382	16066	16743
790	8785	9529	10266	10994	11715	12428	13134	13832	14523	15208	15885
800	7937	8682	9418	10147	10868	11581	12286	12985	13676	14360	15037
810	7100	7845	8581	9310	10030	10744	11449	12147	12839	13523	14200
820	6273	7018	7754	8483	9204	9917	10622	11321	12012	12696	13373
830	5456	6201	6937	7666	8387	9100	9805	10504	11195	11879	12556
840	4649	5394	6130	6859	7580	8293	8998	9697	10388	11072	11749
850	3852	4596	5333	6061	6782	7495	8201	8899	9590	10275	10952
860	3064	3808	4545	5273	5994	6707	7413	8111	8802	9486	10164
870	2285	3029	3766	4494	5215	5928	6634	7332	8023	8707	9385
880	1514	2259	2996	3724	4445	5158	5864	6562	7253	7937	8614
890	753	1498	2234	2963	3683	4396	5102	5800	6492	7176	7853
900	0	745	1481	2210	2930	3643	4349	5047	5739	6423	7100
910	111	0	736	1465	2186	2899	3604	4303	4994	5678	6355
920	221	111	0	729	1449	2162	2868	3566	4257	4942	5619
930	332	222	111	0	721	1434	2139	2838	3529	4213	4890
940	443	333	222	111	0	713	1419	2117	2808	3492	4170
950	555	444	333	222	111	0	706	1404	2095	2779	3457
960	666	556	445	334	223	111	0	698	1389	2074	2751
970	778	667	556	446	334	223	112	0	691	1375	2053
980	890	779	668	557	446	335	224	112	0	684	1361
990	1002	891	780	669	558	447	336	224	112	0	677
1000	1114	1003	893	782	671	559	448	336	224	112	0
1010	1226	1116	1005	894	783	672	560	449	337	225	112
1020	1339	1228	1118	1007	896	784	673	561	449	337	225
1030	1452	1341	1230	1119	1008	897	786	674	562	450	338
1040	1565	1454	1343	1232	1121	1010	899	787	675	563	451
1050	1678	1567	1456	1346	1234	1123	1012	900	788	676	564
1060	1791	1681	1570	1459	1348	1237	1125	1013	902	789	677
1070	1905	1794	1683	1572	1461	1350	1239	1127	1015	903	791
1080	2018	1908	1797	1686	1575	1464	1352	1241	1129	1017	905
1090	2132	2022	1911	1800	1689	1578	1466	1355	1243	1131	1018
1100	2246	2136	2025	1914	1803	1692	1580	1469	1357	1245	1133
1110	2361	2250	2139	2029	1917	1806	1695	1583	1471	1359	1247
1120	2475	2365	2254	2143	2032	1921	1809	1698	1586	1474	1361
1130	2590	2479	2369	2258	2147	2035	1924	1812	1700	1588	1476
1140	2705	2594	2484	2373	2262	2150	2039	1927	1815	1703	1591
1150	2820	2709	2599	2488	2377	2265	2154	2042	1930	1818	1706
1160	2935	2825	2714	2603	2492	2381	2269	2158	2046	1934	1821
1170	3051	2940	2829	2719	2607	2496	2385	2273	2161	2049	1937
1180	3166	3056	2945	2834	2723	2612	2500	2389	2277	2165	2053
1190	3282	3172	3061	2950	2839	2728	2616	2505	2393	2281	2168
1200	3398	3288	3177	3066	2955	2844	2732	2621	2509	2397	2285

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
810	14200	14871	15535	16192	16843	17488	18127	18759	19386	20007	20623
820	13373	14044	14708	15365	16016	16661	17300	17933	18559	19181	19796
830	12556	13227	13891	14548	15199	15844	16483	17116	17743	18364	18979
840	11749	12420	13084	13741	14392	15037	15676	16309	16936	17557	18172
850	10952	11622	12286	12944	13595	14240	14878	15511	16138	16759	17375
860	10164	10834	11498	12156	12807	13452	14090	14723	15350	15971	16586
870	9385	10055	10719	11377	12028	12672	13311	13944	14571	15192	15807
880	8614	9285	9949	10606	11257	11902	12541	13174	13801	14422	15037
890	7853	8524	9187	9845	10496	11141	11780	12412	13039	13660	14276
900	7100	7771	8434	9092	9743	10388	11027	11659	12286	12907	13523
910	6355	7026	7690	8347	8998	9643	10282	10915	11542	12163	12778
920	5619	6289	6953	7611	8262	8907	9546	10178	10805	11426	12042
930	4890	5561	6225	6882	7533	8178	8817	9450	10077	10698	11313
940	4170	4840	5504	6162	6813	7458	8096	8729	9356	9977	10592
950	3457	4127	4791	5448	6100	6744	7383	8016	8643	9264	9879
960	2751	3421	4085	4743	5394	6039	6678	7310	7937	8558	9174
970	2053	2723	3387	4044	4696	5340	5979	6612	7239	7860	8475
980	1361	2032	2696	3353	4004	4649	5288	5921	6548	7169	7784
990	677	1348	2012	2669	3320	3965	4604	5237	5864	6485	7100
1000	0	671	1334	1992	2643	3288	3927	4559	5186	5807	6423
1010	112	0	664	1321	1972	2617	3256	3889	4516	5137	5752
1020	225	113	0	657	1309	1953	2592	3225	3852	4473	5088
1030	338	225	113	0	651	1296	1935	2567	3194	3815	4431
1040	451	338	226	113	0	645	1284	1916	2543	3164	3780
1050	564	452	339	226	113	0	639	1272	1898	2519	3135
1060	677	565	452	339	227	113	0	633	1260	1881	2496
1070	791	678	566	453	340	227	114	0	627	1248	1863
1080	905	792	680	567	454	341	227	114	0	621	1237
1090	1018	906	793	681	568	455	341	228	114	0	615
1100	1133	1020	908	795	682	569	455	342	228	114	0
1110	1247	1135	1022	909	796	683	570	456	342	228	114
1120	1361	1249	1136	1024	911	798	684	571	457	343	229
1130	1476	1364	1251	1138	1025	912	799	685	572	458	344
1140	1591	1479	1366	1253	1140	1027	914	800	686	573	458
1150	1706	1594	1481	1368	1255	1142	1029	915	802	688	574
1160	1821	1709	1596	1484	1371	1257	1144	1031	917	803	689
1170	1937	1824	1712	1599	1486	1373	1260	1146	1032	918	804
1180	2053	1940	1828	1715	1602	1489	1375	1262	1148	1034	920
1190	2168	2056	1943	1831	1718	1605	1491	1378	1264	1150	1036
1200	2285	2172	2060	1947	1834	1721	1607	1494	1380	1266	1152
1210	2401	2288	2176	2063	1950	1837	1724	1610	1496	1382	1268
1220	2517	2405	2292	2180	2067	1953	1840	1727	1613	1499	1385
1230	2634	2522	2409	2296	2183	2070	1957	1843	1729	1616	1501
1240	2751	2639	2526	2413	2300	2187	2074	1960	1846	1732	1618
1250	2868	2756	2643	2530	2417	2304	2191	2077	1963	1850	1735
1260	2985	2873	2760	2648	2535	2421	2308	2194	2081	1967	1853
1270	3103	2990	2878	2765	2652	2539	2426	2312	2198	2084	1970
1280	3221	3108	2996	2883	2770	2657	2543	2430	2316	2202	2088
1290	3338	3226	3113	3001	2888	2775	2661	2548	2434	2320	2206
1300	3457	3344	3232	3119	3006	2893	2779	2666	2552	2438	2324

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
910	12778	13388	13992	14591	15185	15774	16357	16936	17509	18078	18642
920	12042	12652	13256	13855	14449	15037	15621	16199	16773	17341	17905
930	11313	11923	12527	13126	13720	14309	14892	15471	16044	16613	17177
940	10592	11202	11807	12406	12999	13588	14171	14750	15323	15892	16456
950	9879	10489	11094	11693	12286	12875	13458	14037	14610	15179	15743
960	9174	9784	10388	10987	11581	12169	12753	13331	13905	14473	15037
970	8475	9085	9690	10289	10882	11471	12054	12633	13206	13775	14339
980	7784	8394	8998	9597	10191	10780	11363	11942	12515	13084	13648
990	7100	7710	8314	8913	9507	10096	10679	11257	11831	12400	12964
1000	6423	7033	7637	8236	8830	9418	10002	10580	11154	11722	12286
1010	5752	6362	6966	7565	8159	8748	9331	9910	10483	11052	11616
1020	5088	5698	6303	6902	7495	8084	8667	9246	9819	10388	10952
1030	4431	5041	5645	6244	6838	7426	8010	8588	9162	9730	10294
1040	3780	4390	4994	5593	6187	6775	7359	7937	8511	9079	9643
1050	3135	3745	4349	4948	5542	6130	6714	7292	7866	8434	8998
1060	2496	3106	3710	4309	4903	5492	6075	6654	7227	7796	8360
1070	1863	2473	3078	3677	4270	4859	5442	6021	6594	7163	7727
1080	1237	1846	2451	3050	3643	4232	4815	5394	5967	6536	7100
1090	615	1225	1830	2429	3022	3611	4194	4773	5346	5915	6479
1100	0	610	1214	1813	2407	2996	3579	4157	4731	5300	5864
1110	114	0	604	1203	1797	2386	2969	3548	4121	4690	5254
1120	229	115	0	599	1193	1781	2365	2943	3517	4085	4649
1130	344	229	115	0	594	1182	1766	2344	2918	3486	4050
1140	458	344	230	115	0	589	1172	1750	2324	2893	3457
1150	574	459	345	230	115	0	583	1162	1735	2304	2868
1160	689	574	460	345	230	115	0	578	1152	1721	2285
1170	804	690	575	461	346	231	115	0	574	1142	1706
1180	920	806	691	576	462	346	231	116	0	569	1133
1190	1036	922	807	692	577	462	347	232	116	0	564
1200	1152	1038	923	808	694	578	463	348	232	116	0
1210	1268	1154	1039	925	810	695	579	464	348	232	116
1220	1385	1270	1156	1041	926	811	696	580	465	349	233
1230	1501	1387	1273	1158	1043	928	813	697	581	466	349
1240	1618	1504	1389	1275	1160	1045	930	814	698	582	466
1250	1735	1621	1507	1392	1277	1162	1047	931	815	700	583
1260	1853	1738	1624	1509	1394	1279	1164	1048	933	817	701
1270	1970	1856	1741	1627	1512	1397	1281	1166	1050	934	818
1280	2088	1974	1859	1744	1629	1514	1399	1284	1168	1052	936
1290	2206	2092	1977	1862	1747	1632	1517	1402	1286	1170	1054
1300	2324	2210	2095	1980	1866	1750	1635	1520	1404	1288	1172
1310	2442	2328	2213	2099	1984	1869	1753	1638	1522	1406	1290
1320	2561	2447	2332	2217	2102	1987	1872	1757	1641	1525	1409
1330	2680	2565	2451	2336	2221	2106	1991	1875	1760	1644	1528
1340	2799	2684	2570	2455	2340	2225	2110	1994	1879	1763	1647
1350	2918	2803	2689	2574	2459	2344	2229	2113	1998	1882	1766
1360	3037	2923	2808	2694	2579	2464	2348	2233	2117	2001	1885
1370	3157	3042	2928	2813	2698	2583	2468	2352	2237	2121	2005
1380	3276	3162	3048	2933	2818	2703	2588	2472	2356	2241	2124
1390	3396	3282	3168	3053	2938	2823	2708	2592	2476	2361	2245
1400	3517	3402	3288	3173	3058	2943	2828	2712	2597	2481	2365

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
1010	11616	12175	12730	13280	13825	14367	14904	15436	15965	16489	17010
1020	10952	11511	12066	12616	13161	13703	14240	14772	15301	15825	16346
1030	10294	10854	11408	11958	12504	13045	13582	14115	14643	15168	15688
1040	9643	10203	10757	11307	11853	12394	12931	13464	13992	14517	15037
1050	8998	9558	10112	10662	11208	11749	12286	12819	13348	13872	14392
1060	8360	8919	9474	10024	10569	11111	11648	12180	12709	13233	13754
1070	7727	8286	8841	9391	9937	10478	11015	11547	12076	12600	13121
1080	7100	7659	8214	8764	9310	9851	10388	10921	11449	11974	12494
1090	6479	7038	7593	8143	8689	9230	9767	10300	10828	11352	11873
1100	5864	6423	6977	7528	8073	8614	9151	9684	10213	10737	11257
1110	5254	5813	6368	6918	7463	8005	8542	9074	9603	10127	10648
1120	4649	5209	5763	6313	6859	7400	7937	8470	8998	9523	10043
1130	4050	4610	5164	5714	6260	6801	7338	7871	8399	8924	9444
1140	3457	4016	4570	5121	5666	6207	6744	7277	7806	8330	8850
1150	2868	3427	3982	4532	5078	5619	6156	6689	7217	7742	8262
1160	2285	2844	3398	3949	4494	5035	5572	6105	6634	7158	7678
1170	1706	2265	2820	3370	3916	4457	4994	5527	6055	6580	7100
1180	1133	1692	2246	2797	3342	3884	4420	4953	5482	6006	6527
1190	564	1123	1678	2228	2774	3315	3852	4385	4913	5437	5958
1200	0	559	1114	1664	2210	2751	3288	3821	4349	4874	5394
1210	116	0	555	1105	1650	2192	2729	3261	3790	4314	4835
1220	233	116	0	550	1096	1637	2174	2707	3235	3760	4280
1230	349	233	117	0	546	1087	1624	2157	2685	3210	3730
1240	466	350	234	117	0	541	1078	1611	2139	2664	3184
1250	583	467	351	234	117	0	537	1070	1598	2123	2643
1260	701	584	468	351	234	117	0	533	1061	1586	2106
1270	818	702	585	469	352	235	118	0	529	1053	1573
1280	936	820	703	586	470	353	235	118	0	524	1045
1290	1054	938	821	704	588	470	353	236	118	0	520
1300	1172	1056	939	823	706	589	471	354	236	118	0
1310	1290	1174	1058	941	824	707	590	472	354	236	118
1320	1409	1293	1176	1059	943	825	708	591	473	355	237
1330	1528	1411	1295	1178	1061	944	827	709	592	474	356
1340	1647	1530	1414	1297	1180	1063	946	828	711	593	475
1350	1766	1649	1533	1416	1299	1182	1065	947	830	712	594
1360	1885	1769	1652	1536	1419	1302	1184	1067	949	831	713
1370	2005	1888	1772	1655	1538	1421	1304	1186	1069	951	833
1380	2124	2008	1892	1775	1658	1541	1424	1306	1189	1071	952
1390	2245	2128	2012	1895	1778	1661	1544	1426	1309	1191	1073
1400	2365	2248	2132	2015	1898	1781	1664	1546	1429	1311	1193
1410	2485	2369	2252	2136	2019	1902	1784	1667	1549	1431	1313
1420	2606	2490	2373	2256	2139	2022	1905	1788	1670	1552	1434
1430	2727	2610	2494	2377	2260	2143	2026	1908	1791	1673	1555
1440	2848	2732	2615	2498	2381	2264	2147	2030	1912	1794	1676
1450	2969	2853	2736	2620	2503	2386	2268	2151	2033	1915	1797
1460	3091	2974	2858	2741	2624	2507	2390	2272	2155	2037	1919
1470	3212	3096	2980	2863	2746	2629	2512	2394	2276	2159	2040
1480	3334	3218	3102	2985	2868	2751	2634	2516	2398	2280	2162
1490	3457	3340	3224	3107	2990	2873	2756	2638	2521	2403	2285
1500	3579	3463	3346	3230	3113	2996	2878	2761	2643	2525	2407

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
1110	10648	11164	11676	12185	12690	13191	13688	14182	14672	15159	15642
1120	10043	10560	11072	11581	12085	12586	13084	13577	14068	14554	15037
1130	9444	9961	10473	10982	11486	11987	12485	12978	13469	13955	14438
1140	8850	9367	9879	10388	10893	11394	11891	12385	12875	13361	13844
1150	8262	8778	9291	9799	10304	10805	11303	11796	12286	12773	13256
1160	7678	8195	8707	9216	9721	10222	10719	11213	11703	12189	12672
1170	7100	7616	8129	8637	9142	9643	10141	10634	11124	11611	12094
1180	6527	7043	7555	8064	8569	9070	9567	10061	10551	11037	11521
1190	5958	6474	6987	7495	8000	8501	8998	9492	9982	10469	10952
1200	5394	5910	6423	6931	7436	7937	8434	8928	9418	9905	10388
1210	4835	5351	5864	6372	6877	7378	7875	8369	8859	9346	9829
1220	4280	4796	5309	5817	6322	6823	7321	7814	8304	8791	9274
1230	3730	4246	4759	5267	5772	6273	6771	7264	7754	8241	8724
1240	3184	3701	4213	4722	5226	5728	6225	6719	7209	7695	8178
1250	2643	3159	3672	4180	4685	5186	5684	6177	6667	7154	7637
1260	2106	2622	3135	3643	4148	4649	5147	5640	6130	6617	7100
1270	1573	2090	2602	3111	3616	4117	4614	5108	5598	6084	6567
1280	1045	1561	2074	2582	3087	3588	4085	4579	5069	5556	6039
1290	520	1037	1549	2058	2563	3064	3561	4055	4545	5031	5514
1300	0	516	1029	1537	2042	2543	3041	3534	4024	4511	4994
1310	118	0	512	1021	1526	2027	2524	3018	3508	3995	4478
1320	237	119	0	509	1013	1514	2012	2505	2996	3482	3965
1330	356	237	119	0	505	1006	1503	1997	2487	2973	3457
1340	475	356	238	119	0	501	998	1492	1982	2469	2952
1350	594	475	357	238	119	0	497	991	1481	1968	2451
1360	713	595	476	357	239	119	0	494	984	1470	1953
1370	833	714	596	477	358	239	120	0	490	977	1460
1380	952	834	716	597	478	359	239	120	0	487	970
1390	1073	954	836	717	598	479	359	240	120	0	483
1400	1193	1074	956	837	718	599	480	360	240	120	0
1410	1313	1195	1076	958	839	719	600	480	361	241	120
1420	1434	1316	1197	1078	959	840	721	601	481	361	241
1430	1555	1436	1318	1199	1080	961	842	722	602	482	362
1440	1676	1557	1439	1320	1201	1082	963	843	723	603	483
1450	1797	1679	1560	1442	1323	1203	1084	964	845	725	604
1460	1919	1800	1682	1563	1444	1325	1206	1086	966	846	726
1470	2040	1922	1804	1685	1566	1447	1327	1208	1088	968	848
1480	2162	2044	1926	1807	1688	1569	1449	1330	1210	1090	970
1490	2285	2166	2048	1929	1810	1691	1571	1452	1332	1212	1092
1500	2407	2289	2170	2051	1932	1813	1694	1574	1454	1334	1214
1510	2530	2411	2293	2174	2055	1936	1816	1697	1577	1457	1337
1520	2652	2534	2416	2297	2178	2059	1939	1820	1700	1580	1460
1530	2776	2657	2539	2420	2301	2182	2062	1943	1823	1703	1583
1540	2899	2781	2662	2543	2424	2305	2186	2066	1946	1826	1706
1550	3022	2904	2786	2667	2548	2429	2309	2190	2070	1950	1830
1560	3146	3028	2909	2791	2672	2552	2433	2313	2194	2074	1953
1570	3270	3152	3033	2915	2796	2676	2557	2437	2318	2198	2077
1580	3394	3276	3157	3039	2920	2801	2681	2562	2442	2322	2202
1590	3519	3400	3282	3163	3044	2925	2806	2686	2566	2446	2326
1600	3643	3525	3407	3288	3169	3050	2930	2811	2691	2571	2451

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
1210	9829	10308	10785	11257	11727	12193	12657	13117	13573	14027	14478
1220	9274	9754	10230	10703	11172	11639	12102	12562	13019	13473	13923
1230	8724	9204	9680	10153	10622	11089	11552	12012	12469	12922	13373
1240	8178	8658	9134	9607	10077	10543	11006	11466	11923	12377	12828
1250	7637	8117	8593	9066	9535	10002	10465	10925	11382	11836	12286
1260	7100	7580	8056	8529	8998	9465	9928	10388	10845	11299	11749
1270	6567	7047	7523	7996	8466	8932	9395	9855	10312	10766	11217
1280	6039	6518	6995	7468	7937	8404	8867	9327	9784	10237	10688
1290	5514	5994	6470	6943	7413	7879	8342	8802	9259	9713	10164
1300	4994	5474	5950	6423	6892	7359	7822	8282	8739	9193	9643
1310	4478	4957	5433	5906	6376	6842	7305	7765	8222	8676	9127
1320	3965	4445	4921	5394	5864	6330	6793	7253	7710	8164	8614
1330	3457	3936	4412	4885	5355	5821	6284	6744	7201	7655	8106
1340	2952	3431	3908	4381	4850	5317	5780	6240	6697	7150	7601
1350	2451	2930	3407	3880	4349	4815	5279	5739	6195	6649	7100
1360	1953	2433	2909	3382	3852	4318	4781	5241	5698	6152	6603
1370	1460	1939	2416	2888	3358	3824	4288	4748	5204	5658	6109
1380	970	1449	1926	2398	2868	3334	3798	4257	4714	5168	5619
1390	483	963	1439	1912	2381	2848	3311	3771	4228	4682	5132
1400	0	480	956	1429	1898	2365	2828	3288	3745	4199	4649
1410	120	0	476	949	1419	1885	2348	2808	3265	3719	4170
1420	241	121	0	473	943	1409	1872	2332	2789	3243	3693
1430	362	242	121	0	470	936	1399	1859	2316	2770	3221
1440	483	363	242	121	0	466	930	1389	1846	2300	2751
1450	604	484	363	242	121	0	463	923	1380	1834	2285
1460	726	605	485	364	243	122	0	460	917	1371	1821
1470	848	727	607	486	365	243	122	0	457	911	1361
1480	970	849	729	608	487	365	244	122	0	454	905
1490	1092	971	851	730	609	487	366	244	122	0	451
1500	1214	1094	973	852	731	610	488	367	245	122	0
1510	1337	1216	1096	975	854	732	611	489	367	245	123
1520	1460	1339	1219	1098	977	855	734	612	490	368	245
1530	1583	1462	1342	1221	1100	978	857	735	613	491	369
1540	1706	1586	1465	1344	1223	1102	980	858	736	614	492
1550	1830	1709	1589	1468	1347	1225	1104	982	860	738	615
1560	1953	1833	1712	1591	1470	1349	1228	1106	984	862	739
1570	2077	1957	1836	1715	1594	1473	1351	1230	1108	986	863
1580	2202	2081	1961	1840	1719	1597	1476	1354	1232	1110	987
1590	2326	2206	2085	1964	1843	1722	1600	1478	1356	1234	1112
1600	2451	2330	2210	2089	1968	1846	1725	1603	1481	1359	1237
1610	2576	2455	2335	2214	2093	1971	1850	1728	1606	1484	1361
1620	2701	2580	2460	2339	2218	2096	1975	1853	1731	1609	1487
1630	2826	2706	2585	2464	2343	2222	2100	1979	1857	1734	1612
1640	2952	2831	2711	2590	2469	2347	2226	2104	1982	1860	1738
1650	3078	2957	2837	2716	2595	2473	2352	2230	2108	1986	1863
1660	3204	3083	2963	2842	2721	2599	2478	2356	2234	2112	1989
1670	3330	3210	3089	2968	2847	2726	2604	2482	2360	2238	2116
1680	3457	3336	3215	3095	2973	2852	2731	2609	2487	2365	2242
1690	3583	3463	3342	3221	3100	2979	2857	2736	2614	2492	2369
1700	3710	3590	3469	3348	3227	3106	2984	2863	2741	2619	2496

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
1310	9127	9575	10019	10461	10900	11337	11770	12200	12628	13054	13476
1320	8614	9062	9507	9949	10388	10824	11257	11688	12116	12541	12964
1330	8106	8554	8998	9440	9879	10315	10749	11179	11607	12032	12455
1340	7601	8049	8494	8936	9375	9811	10244	10675	11103	11528	11950
1350	7100	7548	7993	8434	8874	9310	9743	10174	10601	11027	11449
1360	6603	7050	7495	7937	8376	8812	9246	9676	10104	10529	10952
1370	6109	6557	7002	7443	7882	8319	8752	9183	9610	10036	10458
1380	5619	6067	6511	6953	7392	7829	8262	8693	9120	9546	9968
1390	5132	5580	6025	6467	6906	7342	7775	8206	8634	9059	9481
1400	4649	5097	5542	5984	6423	6859	7292	7723	8151	8576	8998
1410	4170	4617	5062	5504	5943	6379	6813	7243	7671	8096	8519
1420	3693	4141	4586	5028	5467	5903	6336	6767	7195	7620	8043
1430	3221	3668	4113	4555	4994	5430	5864	6294	6722	7147	7570
1440	2751	3199	3643	4085	4524	4961	5394	5825	6252	6678	7100
1450	2285	2732	3177	3619	4058	4494	4928	5358	5786	6211	6634
1460	1821	2269	2714	3156	3595	4031	4464	4895	5323	5748	6171
1470	1361	1809	2254	2696	3135	3571	4004	4435	4863	5288	5711
1480	905	1352	1797	2239	2678	3114	3548	3978	4406	4831	5254
1490	451	899	1343	1785	2224	2660	3094	3524	3952	4377	4800
1500	0	448	893	1334	1773	2210	2643	3074	3501	3927	4349
1510	123	0	445	887	1326	1762	2195	2626	3054	3479	3901
1520	245	123	0	442	881	1317	1750	2181	2609	3034	3457
1530	369	246	123	0	439	875	1309	1739	2167	2592	3015
1540	492	369	246	123	0	436	870	1300	1728	2153	2576
1550	615	493	370	247	124	0	433	864	1292	1717	2139
1560	739	617	494	371	247	124	0	431	858	1284	1706
1570	863	741	618	495	371	248	124	0	428	853	1276
1580	987	865	742	619	496	372	248	124	0	425	848
1590	1112	989	866	743	620	496	373	249	124	0	422
1600	1237	1114	991	868	745	621	497	373	249	125	0
1610	1361	1239	1116	993	870	746	622	498	374	250	125
1620	1487	1364	1241	1118	995	871	747	623	499	375	250
1630	1612	1489	1366	1243	1120	997	873	749	625	500	375
1640	1738	1615	1492	1369	1246	1122	998	874	750	626	501
1650	1863	1741	1618	1495	1371	1248	1124	1000	876	752	627
1660	1989	1867	1744	1621	1498	1374	1250	1126	1002	878	753
1670	2116	1993	1870	1747	1624	1500	1377	1253	1128	1004	879
1680	2242	2120	1997	1874	1750	1627	1503	1379	1255	1130	1006
1690	2369	2246	2124	2001	1877	1754	1630	1506	1382	1257	1133
1700	2496	2374	2251	2128	2004	1881	1757	1633	1509	1384	1260
1710	2623	2501	2378	2255	2132	2008	1884	1760	1636	1512	1387
1720	2751	2628	2505	2382	2259	2135	2012	1888	1764	1639	1514
1730	2879	2756	2633	2510	2387	2263	2139	2015	1891	1767	1642
1740	3007	2884	2761	2638	2515	2391	2267	2143	2019	1895	1770
1750	3135	3012	2889	2766	2643	2519	2396	2272	2148	2023	1898
1760	3263	3141	3018	2895	2771	2648	2524	2400	2276	2152	2027
1770	3392	3269	3147	3024	2900	2777	2653	2529	2405	2280	2156
1780	3521	3398	3276	3152	3029	2906	2782	2658	2534	2409	2285
1790	3650	3528	3405	3282	3158	3035	2911	2787	2663	2538	2414
1800	3780	3657	3534	3411	3288	3164	3041	2917	2792	2668	2543

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
1410	8519	8939	9356	9771	10183	10592	11000	11404	11807	12207	12604
1420	8043	8462	8880	9294	9707	10116	10523	10928	11330	11730	12128
1430	7570	7990	8407	8821	9234	9643	10050	10455	10858	11257	11655
1440	7100	7520	7937	8352	8764	9174	9581	9986	10388	10788	11185
1450	6634	7054	7471	7886	8298	8707	9114	9519	9922	10321	10719
1460	6171	6590	7008	7422	7835	8244	8651	9056	9458	9858	10256
1470	5711	6130	6548	6962	7375	7784	8191	8596	8998	9398	9796
1480	5254	5674	6091	6505	6918	7327	7734	8139	8542	8941	9339
1490	4800	5220	5637	6052	6464	6874	7281	7685	8088	8488	8885
1500	4349	4769	5186	5601	6013	6423	6830	7235	7637	8037	8434
1510	3901	4321	4738	5153	5565	5975	6382	6787	7189	7589	7987
1520	3457	3876	4294	4708	5121	5530	5937	6342	6744	7144	7542
1530	3015	3435	3852	4266	4679	5088	5495	5900	6303	6702	7100
1540	2576	2996	3413	3827	4240	4649	5056	5461	5864	6263	6661
1550	2139	2559	2977	3391	3803	4213	4620	5025	5427	5827	6225
1560	1706	2126	2543	2958	3370	3780	4187	4592	4994	5394	5791
1570	1276	1695	2113	2527	2940	3349	3756	4161	4563	4963	5361
1580	848	1268	1685	2099	2512	2921	3328	3733	4136	4535	4933
1590	422	842	1260	1674	2086	2496	2903	3308	3710	4110	4508
1600	0	420	837	1252	1664	2074	2481	2886	3288	3688	4085
1610	125	0	417	832	1244	1654	2061	2466	2868	3268	3666
1620	250	125	0	415	827	1237	1644	2048	2451	2851	3248
1630	375	251	125	0	412	822	1229	1634	2036	2436	2834
1640	501	376	251	126	0	410	817	1222	1624	2024	2421
1650	627	502	377	251	126	0	407	812	1214	1614	2012
1660	753	628	503	378	252	126	0	405	807	1207	1605
1670	879	754	629	504	378	252	126	0	402	802	1200
1680	1006	881	756	630	505	379	253	127	0	400	798
1690	1133	1008	883	757	632	506	380	253	127	0	398
1700	1260	1135	1010	884	759	633	507	380	254	127	0
1710	1387	1262	1137	1011	886	760	634	508	381	254	127
1720	1514	1389	1264	1139	1013	888	761	635	509	382	255
1730	1642	1517	1392	1267	1141	1015	889	763	636	510	383
1740	1770	1645	1520	1395	1269	1143	1017	891	764	638	511
1750	1898	1773	1648	1523	1397	1272	1145	1019	893	766	639
1760	2027	1902	1777	1651	1526	1400	1274	1148	1021	894	767
1770	2156	2031	1906	1780	1655	1529	1403	1276	1150	1023	896
1780	2285	2160	2035	1909	1784	1658	1532	1405	1279	1152	1025
1790	2414	2289	2164	2038	1913	1787	1661	1535	1408	1281	1154
1800	2543	2418	2293	2168	2042	1916	1790	1664	1537	1411	1284
1810	2673	2548	2423	2298	2172	2046	1920	1794	1667	1540	1413
1820	2803	2678	2553	2428	2302	2176	2050	1924	1797	1670	1543
1830	2933	2808	2683	2558	2432	2306	2180	2054	1927	1801	1674
1840	3064	2939	2814	2688	2563	2437	2311	2184	2058	1931	1804
1850	3194	3069	2944	2819	2693	2567	2441	2315	2189	2062	1935
1860	3325	3200	3075	2950	2824	2698	2572	2446	2320	2193	2066
1870	3457	3332	3207	3081	2956	2830	2704	2577	2451	2324	2197
1880	3588	3463	3338	3213	3087	2961	2835	2709	2582	2455	2328
1890	3720	3595	3470	3344	3219	3093	2967	2841	2714	2587	2460
1900	3852	3727	3602	3476	3351	3225	3099	2973	2846	2719	2592

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700
1700	0	3852	7495	10952	14240	17375	20370	23238	25989	28632	31175
1725	319	2868	6511	9968	13256	16391	19386	22254	25005	27648	30191
1750	639	1898	5542	8998	12286	15421	18417	21285	24036	26679	29222
1775	960	943	4586	8043	11330	14465	17461	20329	23080	25723	28266
1800	1284	0	3643	7100	10388	13523	16518	19386	22137	24780	27323
1825	1608	325	2714	6171	9458	12593	15589	18457	21208	23851	26394
1850	1935	651	1797	5254	8542	11676	14672	17540	20291	22934	25477
1875	2263	979	893	4349	7637	10772	13767	16635	19386	22029	24573
1900	2592	1309	0	3457	6744	9879	12875	15743	18494	21137	23680
1925	2923	1640	331	2576	5864	8998	11994	14862	17613	20256	22799
1950	3256	1972	664	1706	4994	8129	11124	13992	16743	19386	21930
1975	3591	2307	998	848	4136	7270	10266	13134	15885	18528	21071
2000	3927	2643	1334	0	3288	6423	9418	12286	15037	17680	20223
2025	4264	2981	1672	338	2451	5586	8581	11449	14200	16843	19386
2050	4604	3320	2012	677	1624	4759	7754	10622	13373	16016	18559
2075	4945	3661	2353	1018	807	3942	6937	9805	12556	15199	17743
2100	5288	4004	2696	1361	0	3135	6130	8998	11749	14392	16936
2125	5633	4349	3041	1706	345	2337	5333	8201	10952	13595	16138
2150	5979	4696	3387	2053	691	1549	4545	7413	10164	12807	15350
2175	6327	5044	3735	2401	1039	770	3766	6634	9385	12028	14571
2200	6678	5394	4085	2751	1389	0	2996	5864	8614	11257	13801
2225	7029	5746	4437	3103	1741	352	2234	5102	7853	10496	13039
2250	7383	6100	4791	3457	2095	706	1481	4349	7100	9743	12286
2275	7739	6455	5147	3812	2451	1061	736	3604	6355	8998	11542
2300	8096	6813	5504	4170	2808	1419	0	2868	5619	8262	10805
2325	8456	7172	5864	4529	3168	1778	359	2139	4890	7533	10077
2350	8817	7533	6225	4890	3529	2139	721	1419	4170	6813	9356
2375	9180	7897	6588	5254	3892	2503	1084	706	3457	6100	8643
2400	9546	8262	6953	5619	4257	2868	1449	0	2751	5394	7937
2425	9913	8629	7321	5986	4625	3235	1816	367	2053	4696	7239
2450	10282	8998	7690	6355	4994	3604	2186	736	1361	4004	6548
2475	10653	9370	8061	6727	5365	3976	2557	1108	677	3320	5864
2500	11027	9743	8434	7100	5739	4349	2930	1481	0	2643	5186
2525	11402	10118	8810	7475	6114	4725	3306	1857	375	1972	4516
2550	11780	10496	9187	7853	6492	5102	3683	2234	753	1309	3852
2575	12159	10876	9567	8233	6871	5482	4063	2614	1133	651	3194
2600	12541	11257	9949	8614	7253	5864	4445	2996	1514	0	2543
2625	12925	11641	10333	8998	7637	6248	4829	3379	1898	384	1898
2650	13311	12028	10719	9385	8023	6634	5215	3766	2285	770	1260
2675	13700	12416	11107	9773	8412	7022	5603	4154	2673	1159	627
2700	14090	12807	11498	10164	8802	7413	5994	4545	3064	1549	0

DESIRED BORON CONCENTRATION (ppmB)

JPM A1b RO

Facility: McGuire Task No.: 215ZF0001

Task Title: Monitor Critical Safety Function JPM No.: 2008 Admin - JPM A1b
Status Trees RO

K/A Reference: GK/A 2.1.19 (3.9)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- The plant was at 100% power when an automatic Reactor Trip and Safety Injection Occurred.
 - The operating crew implemented EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
 - The CRSRO has just transitioned to EP/1/A/5000/E-2, Faulted Steam Generator Isolation.

Task Standard: The operator will determine that a Valid Orange Path exists on Containment, and Valid Yellow Paths exist on Heat Sink and NC Inventory. The Operator will also determine that the existing Red Path on Subcriticality is invalid. The Operator will recommend transition to FR-Z.1. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: OMP 04-03, Use of Abnormal and Emergency Procedures
EP/1/A/5000/E-0, Reactor Trip or Safety Injection
EP/1/A/5000/F-0, Critical Safety Function Status Trees
EP/1/A/5000/E-2, Faulted Steam Generator Isolation.

Handouts: EP/1/A/5000/F-0, Critical Safety Function Status Trees
2008 Admin - JPM A1b RO

Initiating Cue: The STA is needed to confirm the proper EAL and classification. The Control Room SRO directs you to validate the Critical Safety Function Status Trees (CSFST) per EP/1/A/5000/F-0.

Time Critical Task: NO

Validation Time: 15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39, 100% Power MOL
2. Place in RUN and allow time to stabilize
3. Insert XMT-NS001 to a value of 0, (Containment pressure fails to 0)
4. Insert XMT-NS002 to a value of 0, (Containment pressure fails to 0)
5. Insert MALF-ENB0013A failed to 100%.
6. Insert MALF-SM007A = 3.75×10^6 lbm/hr.
7. Carry out the Actions of E-0 Steps 1-20, and then Transition to E-2 Faulted Steam Generator.
8. Stabilize the plant.
9. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap **IC-129** (May 2008).
2. Verify that OAC shows a Red Path on Subcriticality, Green Path on Core Cooling, Yellow Path on Heat Sink, Green path on Integrity, Green Path on Containment, and a Yellow Path on NC Inventory.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/F-0.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(Step 1) Monitor Critical Safety Functions:</p> <p>(Step 1.a) Use attached status trees or OAC to monitor Critical Safety Functions (CSFs).</p> <p>(Step 1.b) The following table may be used to track status of CSFs.</p>	<p>The Operator recognizes that the OAC is available, and uses attached trees to verify validity of OAC indications.</p> <p>The Operator may or may not use the attached Table.</p>		
*2	<p>(Subcriticality) The operator evaluates Subcriticality as follows:</p> <ul style="list-style-type: none"> • Reactor Trip Required. • Power < 5% on P/R or W/R. • SUR Zero or Negative on I/R or W/R. 	<p>Operator verifies that 1FO-1 Annunciator is LIT, and determines that Reactor Trip is required.</p> <p>Operator observes that Power Range Channel N-41 has failed high, that Power Range Channels N42-N44 are < 5%, and that W/R power level is < 5%.</p> <p>Operator observes that N35 & N36 are reading as expected but still above P-6. Indicated SUR on both channels are Negative.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	<ul style="list-style-type: none"> • I/R SUR more negative than -0.2 DPM 	<p>Operator observes that both I/R SUR Channels N35 & N36 are reading approx - 0.3 DPM</p> <p>Operator determines that due to the failed PR Channel 41 the indicated RED Path indication for Subcriticality is Invalid and concludes that <u>Subcriticality CSFST is GREEN.</u></p>		
3	<p>(Core Cooling) The operator evaluates Core Cooling as follows:</p> <ul style="list-style-type: none"> • CET < 1200°F. • NC Subcooling based on CETs > 0°F. 	<p>Operator observes that CETs are < 1200°F.</p> <p>Operator observes NC Subcooling to be 60-70°F.</p> <p>Operator determines that <u>Core Cooling CSFST is GREEN.</u></p>		
4	<p>(Heat Sink) The operator evaluates Heat Sink as follows:</p> <ul style="list-style-type: none"> • N/R Level in at least one S/G > 11% (32% ACC). • Total Feedwater Flow to Intact S/Gs > 450 gpm. • Pressure in all SGs < 1225 psig. • NR Level in all SGs < 83%. 	<p>Operator observes that no SG level is > 32% Narrow Range Level.</p> <p>Operator observes that Total CA flow is > 450 gpm.</p> <p>Operator observes that pressure in all SGs < 1225 psig.</p> <p>Operator observes that NR Level in all SGs < 83%.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	<ul style="list-style-type: none"> • Pressure in all SGs < 1170 psig. • NR Level in all SGs > 11% {32%}. 	<p>Operator observes that pressure in all SGs < 1170 psig.</p> <p>Operator recognizes the need to use Adverse Containment Numbers</p> <p>Operator observes that NR Level in all SGs < 32%.</p> <p>Operator determines that <u>Yellow Path exists on Heat Sink CSFST, suggesting use of FR-H.5.</u></p>		
5	<p>(NC Integrity) The operator evaluates Heat Sink as follows:</p> <ul style="list-style-type: none"> • Temperature Decrease in all Cold Legs < 100°F in the last 60 minutes. • All NC T-Colds > 300°F. 	<p>Operator observes that in the last 60 minutes temperature decrease in all Cold Legs is < 100°F.</p> <p>(With out the use of trends the Operator would determine this by observing that all NC temps are >500 F which would make it impossible for them to have decreased > 100°F)</p> <p>Operator observes that all NC Tcolds are > 300°F.</p> <p><u>Operator determines that NC Integrity CSFST is GREEN.</u></p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Containment) The operator evaluates Containment as follows: <ul style="list-style-type: none"> • Containment Pressure < 15 psig. • Containment Pressure < 3 psig. 	Operator observes that Containment Pressure is < 15 psig. Operator observes that Containment Pressure is > 3 psig. (All Containment Pressure Gages are reading approx. 6 psig.) Operator determines that even though a Green condition is indicated on SPDS, a <u>Valid Orange Path exists on Containment CSFST and FR-Z.1 should be implemented.</u>		
7	(NC Inventory) The operator evaluates NC Inventory as follows: <ul style="list-style-type: none"> • Pzr Level < 92%. • Pzr Level > 17%. 	Operator observes that Pzr Level is < 92%. Operator observes that Pzr Level is < 17%. Operator determines that a <u>valid Yellow Path exists in NC Inventory CSFST suggesting use of FR-I.2.</u>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	Determine the status of all CSF.	<p>Operator determines the following:</p> <ul style="list-style-type: none"> • * Subcriticality – Indicated Red Path is invalid, and CSF is Green. • Core Cooling – CSF is Green. • Heat Sink - Yellow Path suggesting use of FR-H.5. • NC Integrity – CSF is Green. • * Containment – Valid Orange Path exists requiring the use of FR-Z.1. • NC Inventory – Yellow Path suggesting use of FR-I.2. <p>* <u>Operator recommends Transition to FR-Z.1</u></p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A1b RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The plant was at 100% power when an automatic Reactor Trip and Safety Injection Occurred.
- The operating crew implemented EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- The CRSRO has just transitioned to EP/1/A/5000/E-2, Faulted Steam Generator Isolation.

INITIATING CUE:

The STA is needed to confirm the proper EAL and classification. The Control Room SRO directs you to validate the Critical Safety Function Status Trees (CSFST) per EP/1/A/5000/F-0.

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. EP/1/A/5000/F-0
Revision No. 004

INFORMATION ONLY

PREPARATION

(2) Station McGuire Nuclear Station

(3) Procedure Title Critical Safety Function Status Trees

(4) Prepared By Weiner, Michael R *[Signature]* Date September 26, 2003

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.

- Yes (New procedure or revision with major changes)
- No (Revision with minor changes)
- No (To incorporate previously approved changes)

(6) Reviewed By S Hackney (QR) Date 10/13/03
 Cross-Disciplinary Review By _____ (QR) NA JBH Date 10/13/03
 Reactivity Mgmt. Review By _____ (QR) NA JBH Date 10/13/03
 Mgmt. Involvement Review By _____ (OPS Supt.) NA JBH Date 10/13/03

(7) Additional Reviews

Reviewed By _____ Date _____
 Reviewed By _____ Date _____

(8) Temporary Approval (if necessary)

By _____ (OSM/QR) Date _____
 By _____ (QR) Date _____

(9) Approved By *[Signature]* Date 10/24/03

PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy _____ Date _____
 Compared with Control Copy _____ Date _____
 Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____
 Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification

- Yes NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- Yes NA Required enclosures attached?
- Yes NA Data sheets attached, completed, dated and signed?
- Yes NA Charts, graphs, etc. attached, dated, identified, and marked?
- Yes NA Procedure requirements met?

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

(14) Remarks (Attach additional pages, if necessary.)

A. Purpose

This procedure provides guidance on monitoring the Critical Safety Functions.

B. Symptoms or Entry Conditions

This procedure is entered from:

- EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection), when S/I cannot be terminated and cause has not been determined.
- On any transition out of EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

C. Operator Actions

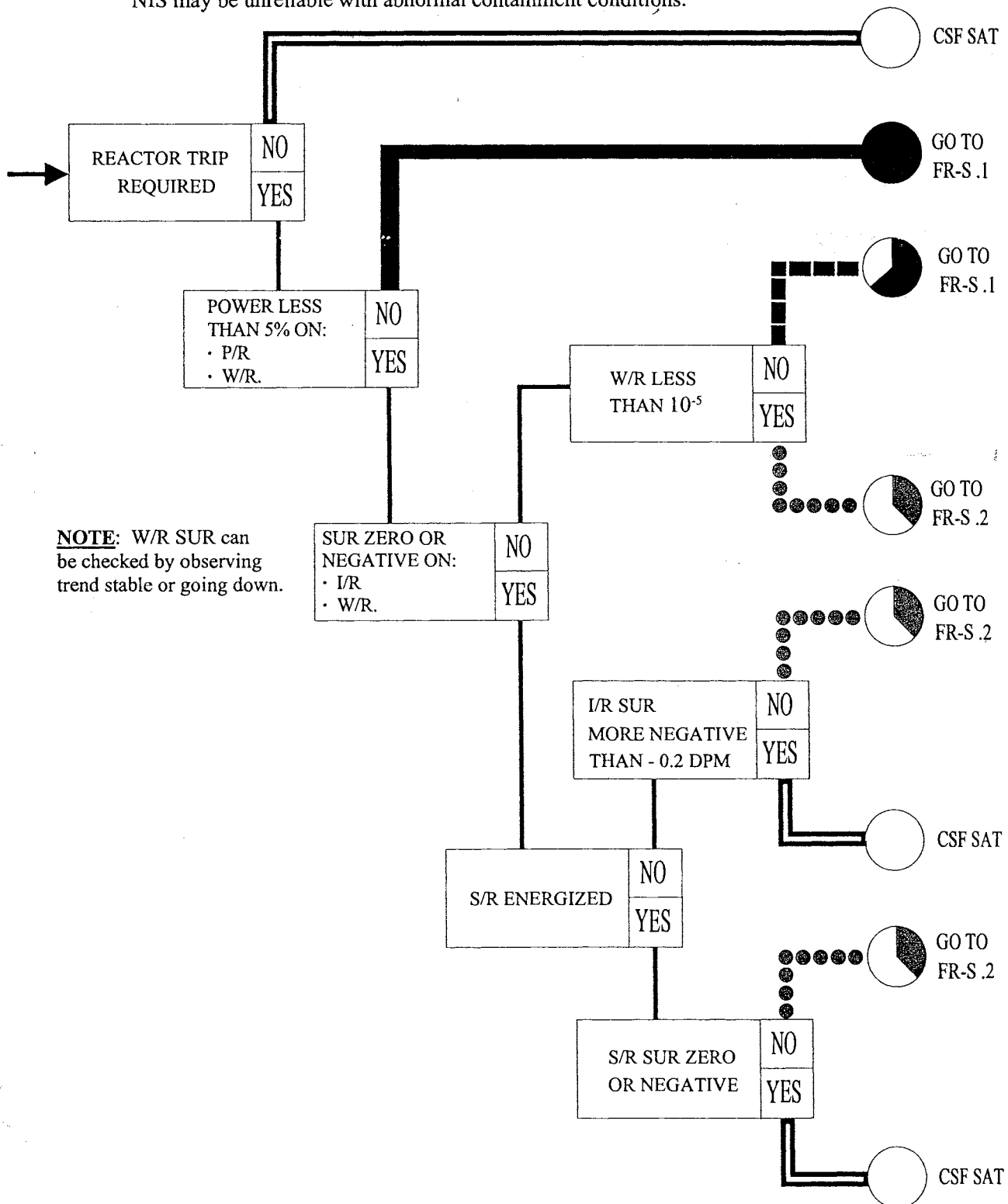
1. Monitor Critical Safety Functions:

- a. Use attached status trees or OAC to monitor Critical Safety Functions (CSFs).
- b. The following table may be used to track status of CSFs.

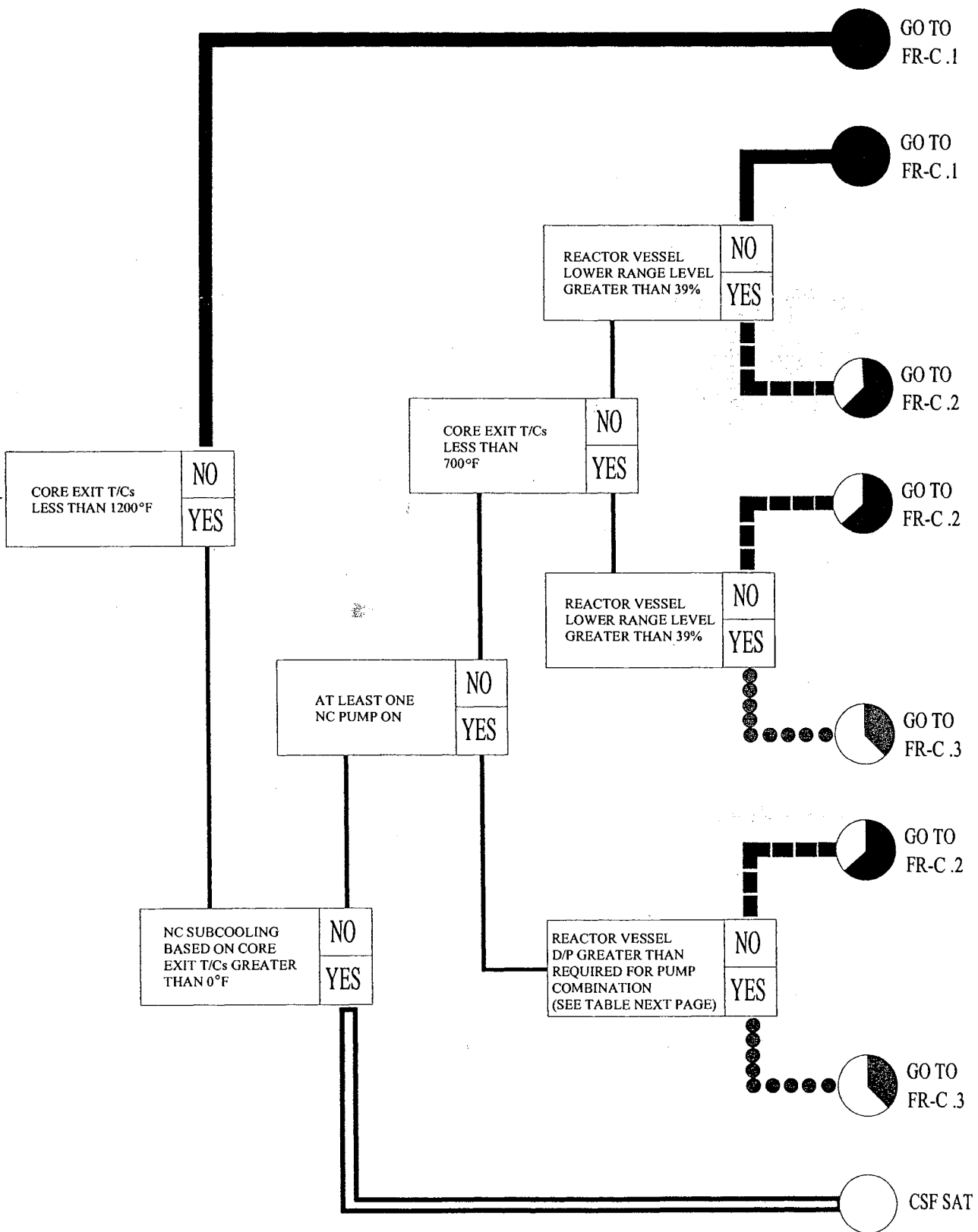
TIME	SUB-CRITICALITY	CORE COOLING	HEAT SINK	NC INTEGRITY	CONTAINMENT	NC INVENTORY	INITIAL

END

NOTE: Only W/R Neutron Flux is environmentally qualified. Normal NIS may be unreliable with abnormal containment conditions.

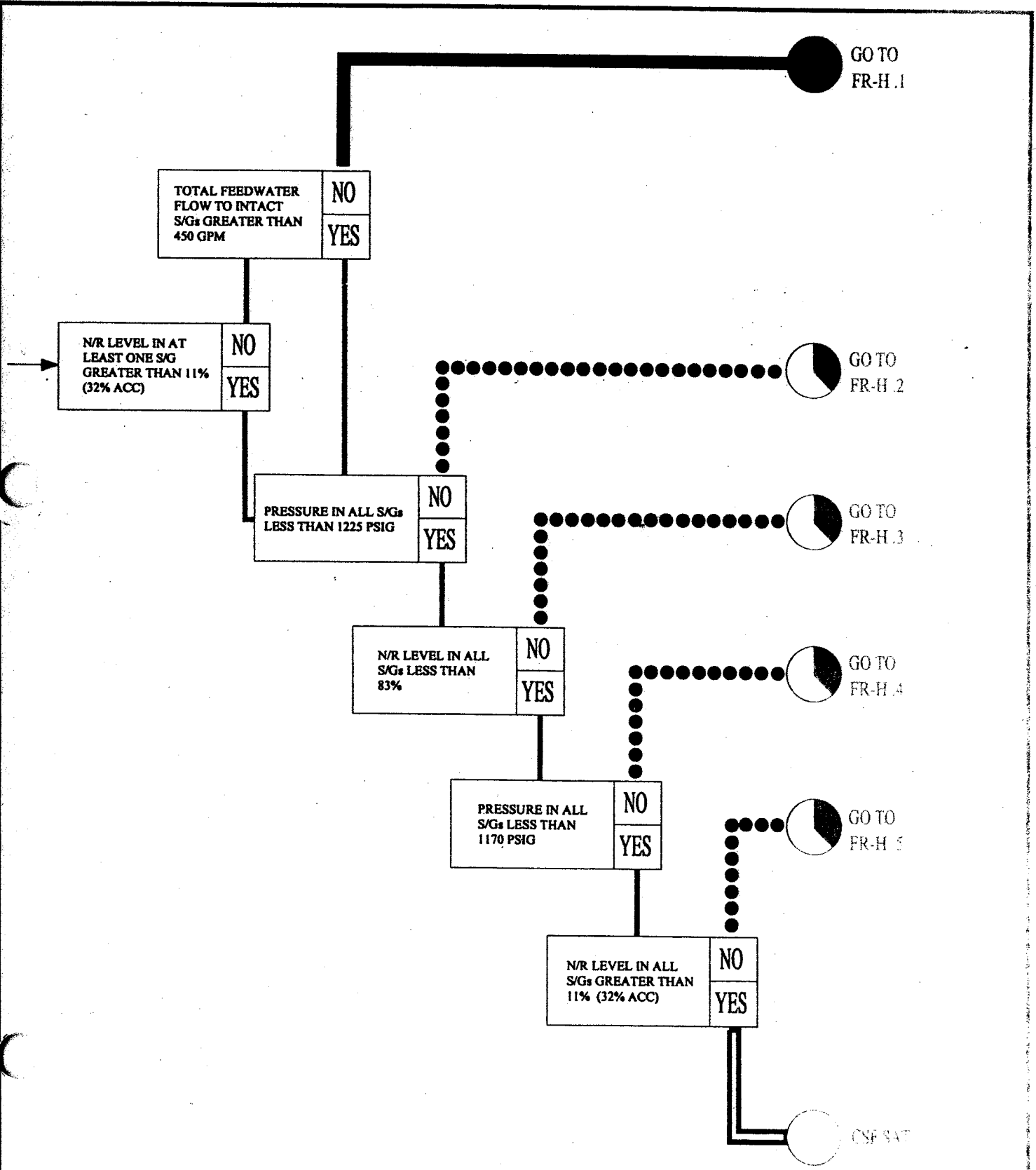


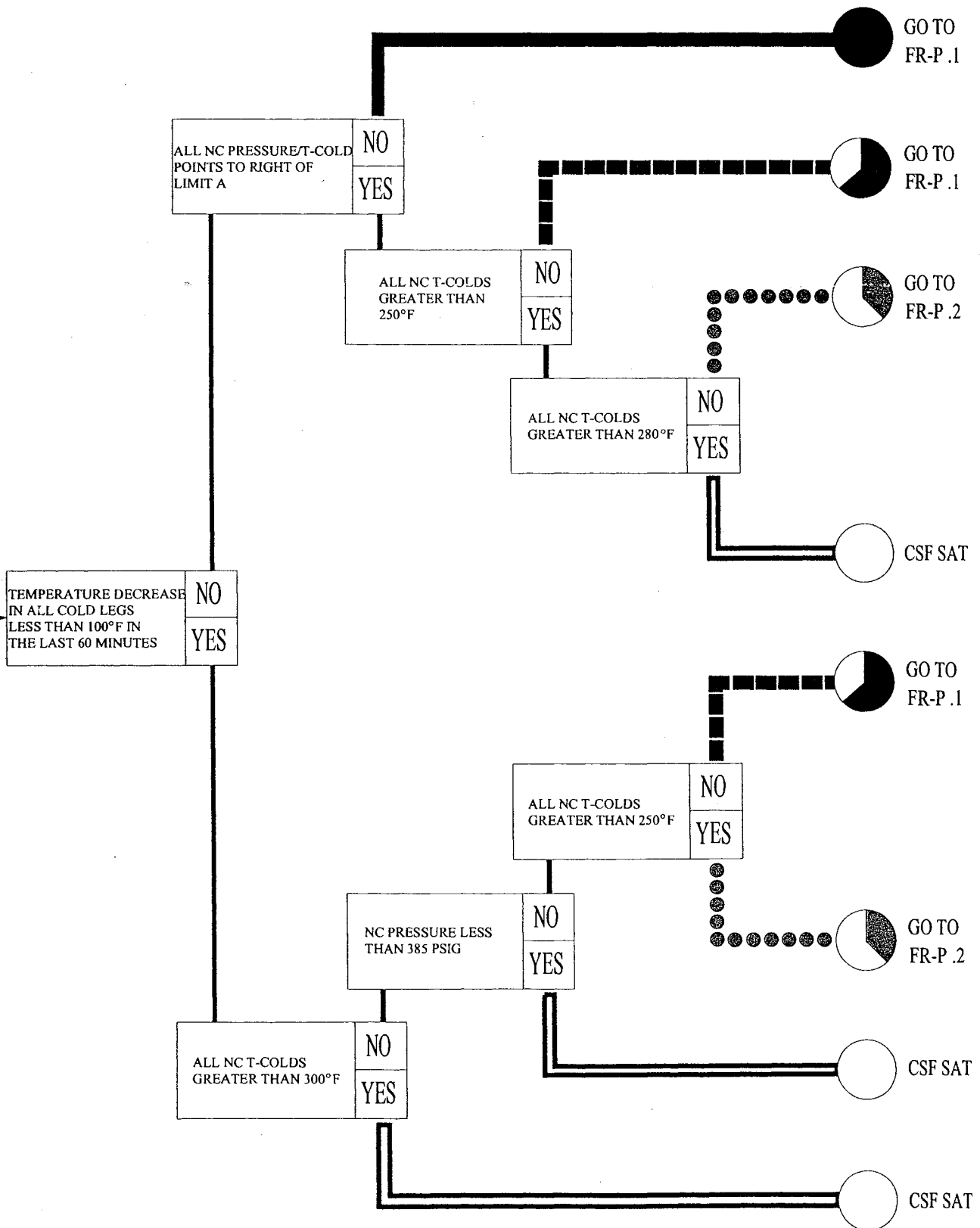
NOTE: W/R SUR can be checked by observing trend stable or going down.

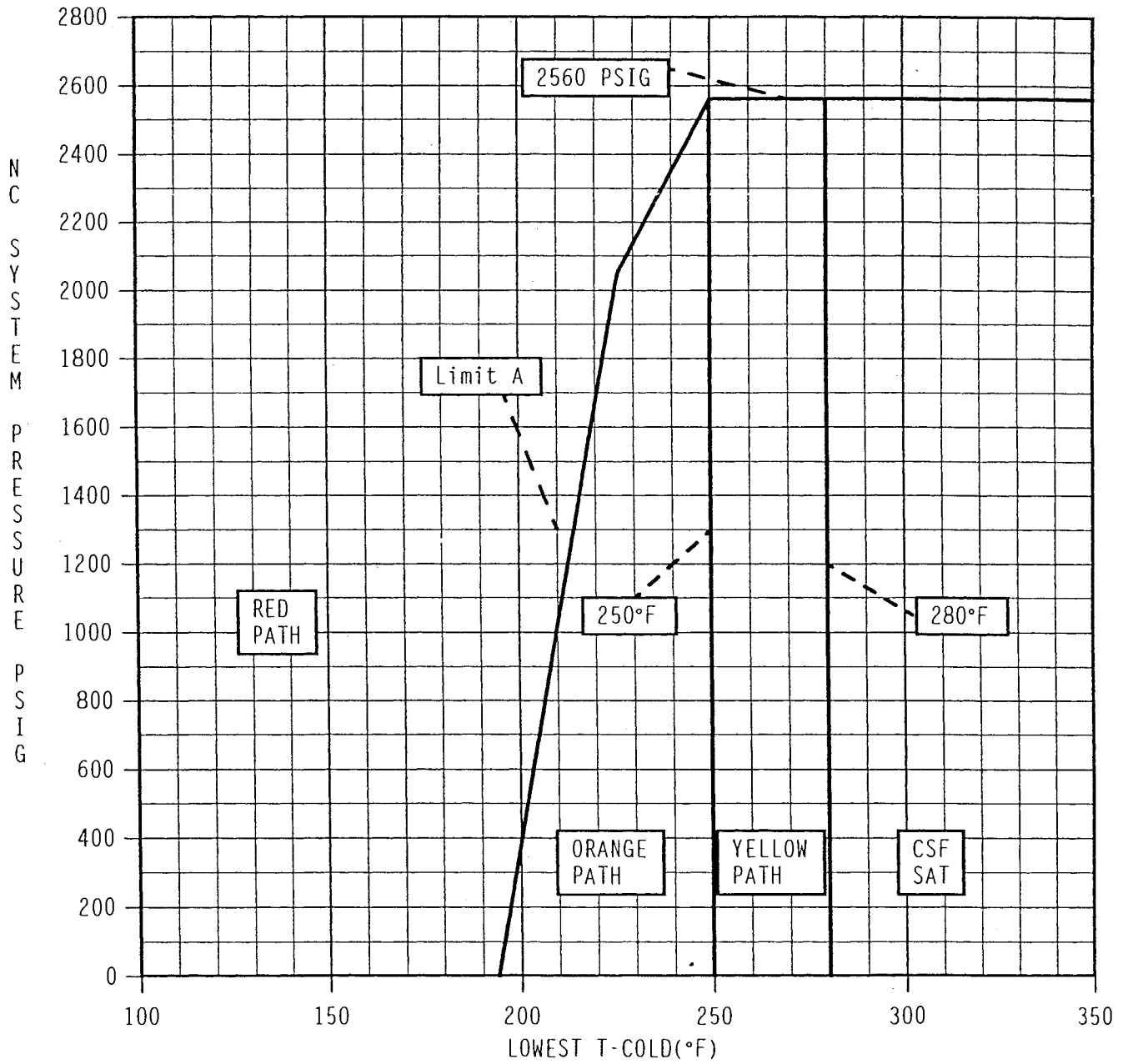


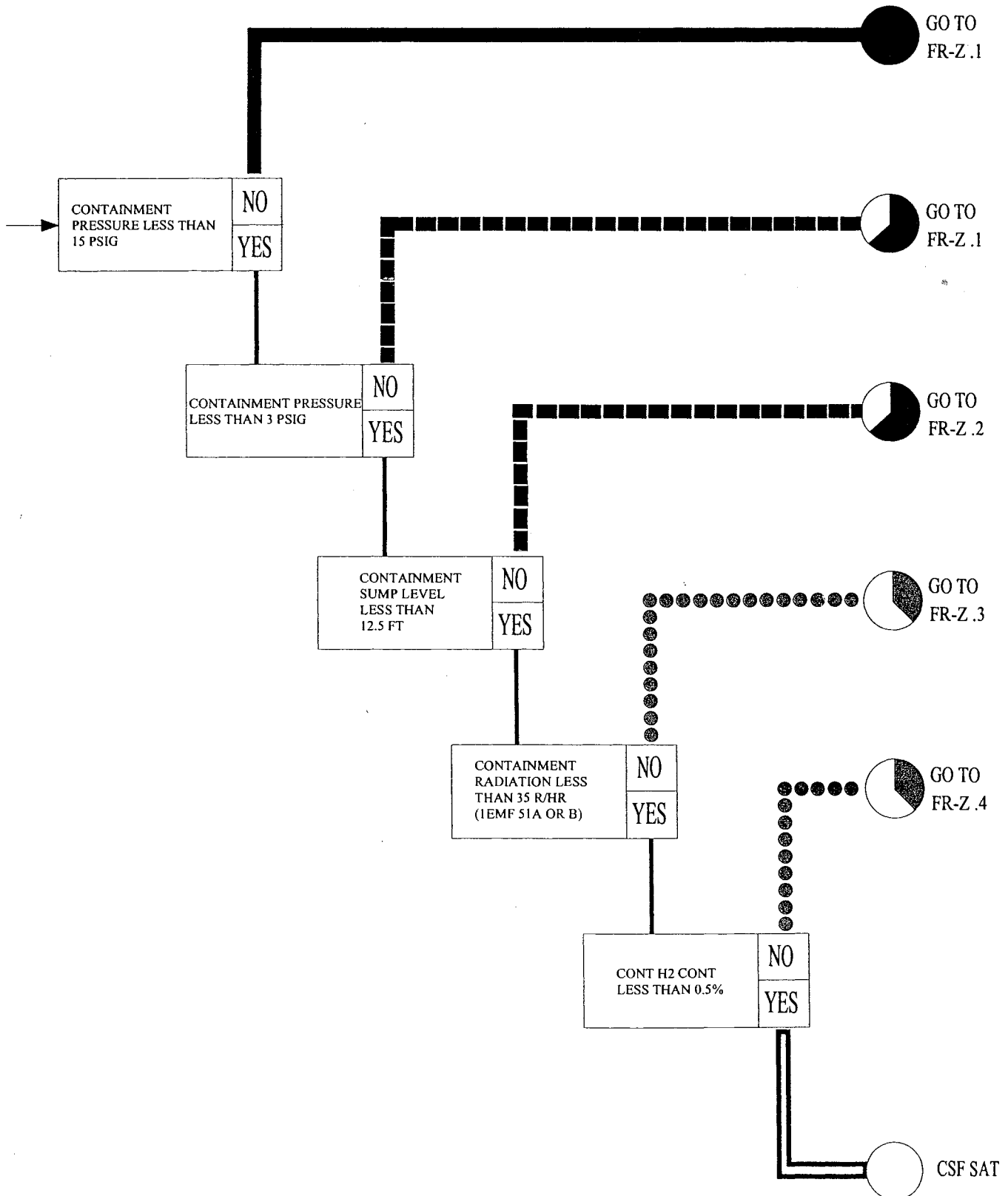
"REACTOR VESSEL D/P" SETPOINTS FOR DEGRADED CORE COOLING

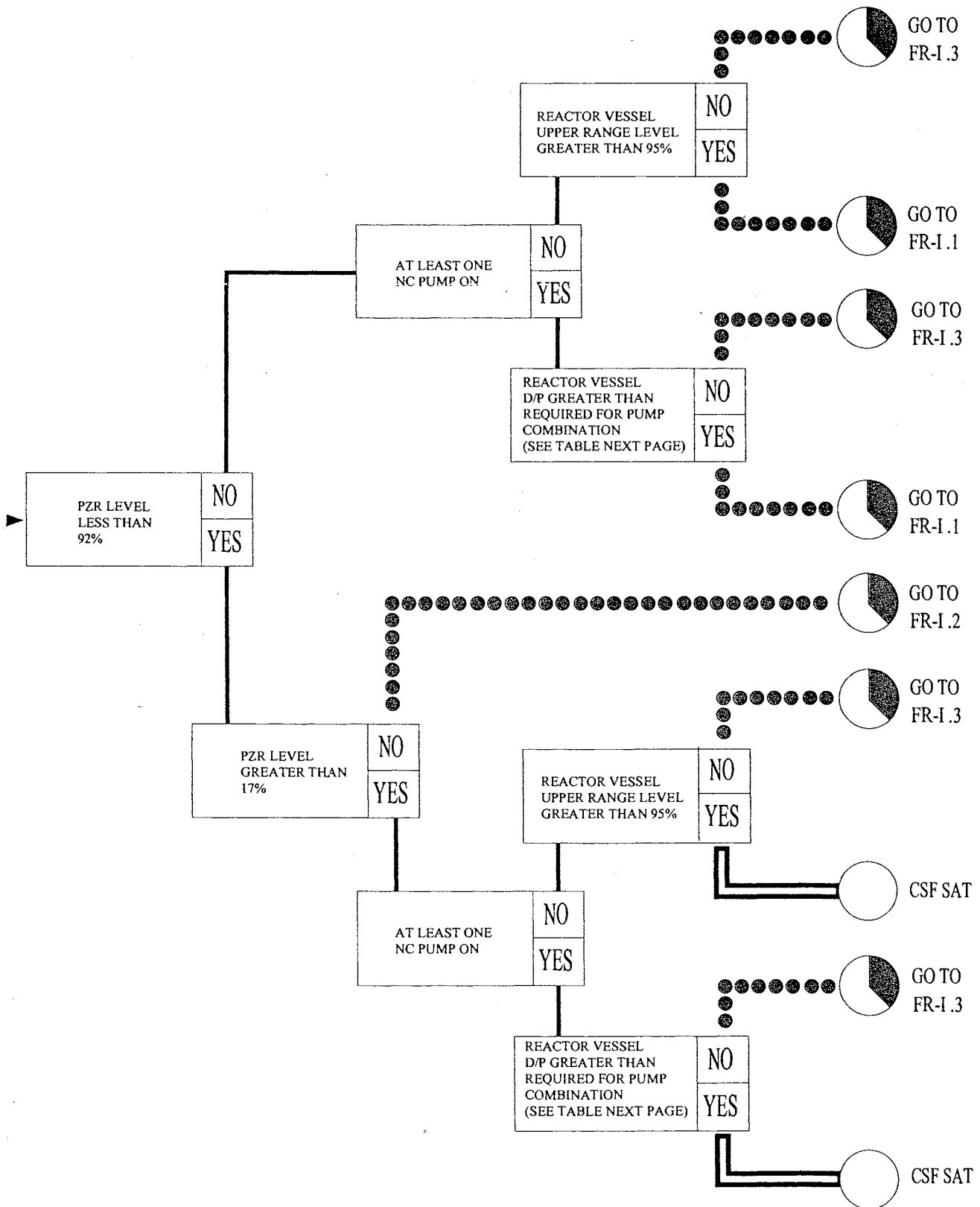
Number of NC Pumps On	Required "REACTOR VESSEL D/P"			
	TRN A With 1A NC Pump		TRN B With 1C NC Pump	
	ON	OFF	ON	OFF
4	44%	N/A	44%	N/A
3	30%	24%	30%	24%
2	23%	15%	23%	15%
1	16%	10%	16%	10%











"REACTOR VESSEL D/P" SETPOINTS FOR REACTOR COOLANT INVENTORY

Number of NC Pumps On	Required "REACTOR VESSEL D/P"			
	TRN A With 1A NC Pump		TRN B With 1C NC Pump	
	ON	OFF	ON	OFF
4	95%	N/A	95%	N/A
3	74%	39%	74%	39%
2	59%	23%	59%	23%
1	50%	14%	50%	14%

JPM A2 RO

Facility: McGuire Task No.: 301OMP025

Task Title: Identify Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump JPM No.: 2008 Admin - JPM A2 RO

K/A Reference: GK/A 2.2.13 (4.1)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Unit 1 is at 100% power
- A severe seal leak has just been discovered on 1B NI Pump.
- The WCC SRO has informed you that 1NI-149 has a history of seat leakage.

Task Standard: Identify the Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump. Component, positions and sequence are identified accurately.

Required Materials: None

General References: SOMP 02-01, Safety Tagging and Configuration Control
NSD 500, Red Tags/Configuration Control Tags
McGuire Flow Diagram, Drawing #MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI)

Handouts: List of Suggested Tagged Components for 1B NI Pump (Blank).
McGuire Flow Diagram, Drawing #MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI)

Initiating Cue: The Work Control Center Supervisor has directed you to identify the Mechanical and Electrical Isolation Boundaries needed to isolate the 1B NI Pump for pump repair. Include the components, their isolated positions and the sequence they are to be manipulated.

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue, MCFD-1562-03.00 and the List of Suggested Tagged Components for 1B NI Pump (Last Two Pages of this JPM).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1 (See Key for CT*)	Operator reviews MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI) and determines components required to be tagged.	<p>Operator reviews MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI) and determines that the following components are required to be tagged:</p> <ul style="list-style-type: none"> • 1B NI Pump Motor DC Fuse Block • 1B NI Pump Motor Bkr • 1NI - 144B • 1NI - 152B • 1NI - 150B • 1NI - 136B • 1NI - 135B • 1NI - 144B Bkr • 1NI - 152B Bkr • 1NI - 150B Bkr • 1NI - 136B Bkr • 1NI - 135B Bkr • 1NI – 141 (Drain) • 1NI – 142 (Drain) • 1NI – 140 (Drain) • 1NI – 137 (Vent) • 1NI – 402 (Vent) • 1NI-139 (Drain) • 1NI-210 (Vent) • 1NI-858 (Optional) <p>Cue if needed:</p> <p>Specific breaker compartments are not required.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*2	Operator determines position of components required to be tagged.	Per KEY		
*3	Operator determines sequence in which the components are required to be tagged.	Per KEY		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A2 RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

Component	Position	Sequence
1B NI Pump Motor DC Control Power Fuse Block*	Removed	1 ^A
1B NI Pump Motor Breaker*	Racked Out	1 ^A
1NI - 144B*	CLOSED	2
1NI-152B*	CLOSED	2
1NI-150B*	CLOSED	2
1NI -136B*	CLOSED	2or3
1NI - 135B*	CLOSED	2or3
1NI - 144B Breaker*	OPEN	4 ^A
1NI-152B Breaker*	OPEN	4 ^A
1NI-150B Breaker*	OPEN	4 ^A
1NI -136B Breaker*	OPEN	4 ^A
1NI - 135B Breaker*	OPEN	4 ^A
1NI – 141 (Drain)*	OPEN	5 ^A
1NI – 142 (Drain)*	OPEN	5 ^A

VERIFICATION OF COMPLETION

Component	Position	Sequence
1NI – 140 (Drain)*	OPEN	5 ^A
1NI – 137 (Vent)*	OPEN	5 ^B
1NI – 402 (Vent)*	OPEN	5 ^B
1NI-139 (Drain)	OPEN	5 ^C
1NI-210 (Vent)	OPEN	5 ^C
1NI-858 (Isolation)	CLOSED	5 ^C

NOTES:

* - Denotes Critical Step as modified by Note.

1A – Either one of these actions will satisfy the critical nature of this step.

4A – Breaker must be opened after valve is positioned.

5A - As a MINIMUM, either Drain 1NI –141, or a combination of 1NI-140 and 1NI – 142 are required to be OPEN.

5B – At least ONE Vent is (1NI-137 or 402) required to be OPEN.

5C – These valves are optional.

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is at 100% power
- A severe seal leak has just been discovered on 1B NI Pump.
- The WCC SRO has informed you that 1NI-149 has a history of seat leakage.

INITIATING CUE:

The Work Control Center Supervisor has directed you to identify the Mechanical and Electrical Isolation Boundaries needed to isolate the 1B NI Pump for pump repair. Include the components, their isolated positions and the sequence they are to be manipulated.

JPM CUE SHEET

List of Suggested Tagged Components

Component	Position	Sequence

JPM CUE SHEET

Component	Position	Sequence

NOTE: Use spaces as necessary/Use back of form if more space is needed

JPM A4 RO

Worksheet

Facility: McGuire Task No.: 215ZFI003

Task Title: Calculate Reactor Vessel Head Venting Time JPM No.: 2008 Admin - JPM A4 RO

K/A Reference: GK/A 2.4.13 (4.0)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: EP/1/A/5000/FR-I.3 (Response to Voids in Reactor Vessel) has been implemented and completed through step 20.a.

The following conditions exist:

Containment Pressure	6 psig
Lower Containment Temperature	170 °F
Containment H ₂ Concentration	2.4%
NC Pressure	260 psig

Task Standard: Reactor Vessel Head venting time calculated to fall between 19.6 and 22.4 minutes. All critical tasks evaluated as satisfactory.

Required Materials: Calculator

General References: EP/1/A/5000/FR-I.3, Response to Voids in the Reactor Vessel

Handouts: EP/1/A/5000/FR-I.3, Response to Voids in the Reactor Vessel

Initiating Cue: The CRSRO has directed you to calculate maximum venting time per Enclosure 1, (Allowable H₂ Venting Time) of EP/1/A/5000/FR-I.3, (Response to Voids in Reactor Vessel).

Time Critical Task: NO

Validation Time: 20 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/FR-I.3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 20.b) Calculate maximum venting time PER Enclosure 1 (allowable H2 Venting Time).	Operator addresses Enclosure 1.		
*2	<p>(Step 1) Calculate "A"</p> $A = 9,500 (x) \frac{(P+14.7)}{14.7} (x) \frac{492}{(T+460)}$ <p>Where:</p> <p>P = Containment pressure (PSIG)</p> <p>T = Lower containment ave. temp (⁰F)</p> <p>A = _____</p>	<p>RO calculates "A"</p> $9,500 (x) \frac{(6+14.7)}{14.7} (x) \frac{492}{(170+460)}$ <p>P = 6 as stated in Initial Conditions. T = 170 as stated in Initial Conditions.</p> <p>This equals 9,500 x 1.41 x 0.78 and this equals:</p> <p>A = <u>10448.1</u></p>		
*3	<p>(Step 2) Calculate "B"</p> $B = (3 - H) (x) A$ <p>where</p> <p>H = Containment H-2 Concentration (%).</p> <p>B = _____</p>	<p>RO calculates "B"</p> $(3 - 2.4) x 10448.1 =$ <p>H = 2.4 as stated in Initial Conditions. A = Calculated Value in Step 1.</p> $(0.6) x (10448.1) =$ <p>"B" = <u>6268.9</u></p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 3) Determine C from the curve for the current NC system pressure	RO uses Curve on Page 2 of 2 of Enclosure 1, and determines C to equal 300 ± 20 using curve		
*5	(Step 4) Calculate T $T = B/C =$ Venting Time in minutes $T = \underline{\hspace{2cm}} / \underline{\hspace{2cm}}$ $T = \underline{\hspace{2cm}}$ minutes	RO calculates T $\frac{6268.9}{300} =$ B = Calculated Value in Step 2. C = Value obtained from Curve in Step 3. 20.9 minutes (Acceptable range of 19.6 – 22.4 minutes)		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A4 RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS: EP/1/A/5000/FR-I.3 (Response to Voids in Reactor Vessel) has been implemented and completed through step 20.a.
The following conditions exist:

Containment Pressure	6 psig
Lower Containment Temperature	170 °F
Containment H ₂ Concentration	2.4%
NC Pressure	260 psig

INITIATING CUE: The CRSRO has directed you to calculate maximum venting time per Enclosure 1, (Allowable H₂ Venting Time) of EP/1/A/5000/FR-I.3, (Response to Voids in Reactor Vessel).

CALCULATION OF MAXIMUM ALLOWABLE VENTING TIME

STEP 1: Calculate A

$$A = 9,500 \times \frac{(P + 14.7)}{14.7} \times \frac{492}{(t + 460)}$$

Where: P = Containment pressure (PSIG)

t = Lower containment ave temp (°F)

$$A = 9,500 \times \frac{(\text{___} + 14.7)}{14.7} \times \frac{492}{(\text{___} + 460)}$$

$$A = 9,500 \times \text{___} \times \text{___}$$

$$A = \text{___}$$

STEP 2: Calculate B

$$B = (3 - H) \times A$$

where: H = Containment H₂ Concentration (%)

$$B = (3 - \text{___}) \times \text{___}$$

$$B = \text{___}$$

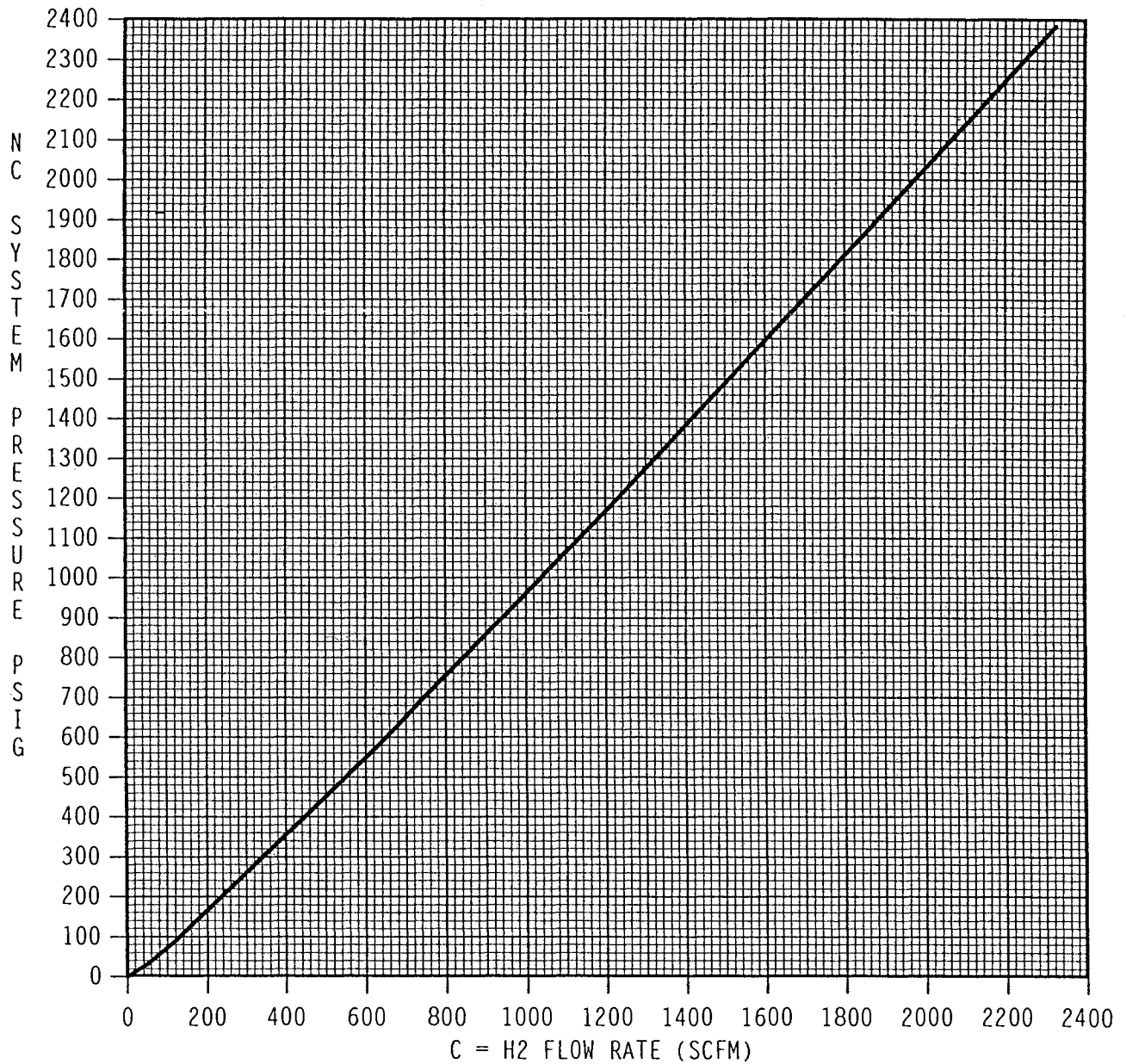
STEP 3: Determine C from the curve (on page 2) for the current NC system pressure.

STEP 4: Calculate T

T = B/C = Venting Time in minutes

$$T = \text{___} / \text{___}$$

$$T = \text{___} \text{ minutes}$$



Facility:	McGuire	Date of Examination:	5/12/08
Examination Level:	SRO	Operating Test Number:	N08-1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed	
Conduct of Operations	M, R	2.1.25 (4.2)	Ability to interpret reference materials, such as graphs, curves, tables, etc.
		JPM:	Calculate Dilution Needed for a Specified Rod Change
Conduct of Operations	N, R	2.1.20 (4.6)	Ability to interpret and execute procedure steps
		JPM:	Approve a Completed Procedure
Equipment Control	N, R	2.2.13 (4.3)	Knowledge of Tagging and Clearance Procedures
		JPM:	Review Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump
Radiation Control	N, R	2.3.4 (3.7)	Knowledge of radiation exposure under normal or emergency conditions.
		JPM:	Take On-Site Protective Actions During a General Emergency
Emergency Procedures/Plan	N, R	2.4.44 (4.4)	Knowledge of Emergency Plan Protective Action Recommendations
		JPM:	Make Protective Action Recommendations and Perform Initial Notification
NOTE:	All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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)		

SRO Admin JPM Summary

- A1a This is a modified JPM using Bank JPM OP-MC-JPM-ADM:214 as its basis. The operator will be given a set of initial conditions and told that it is desired to insert the Bank D Control Rods about 50 steps. The Operator will be given the Core Data Book and asked to manually determine the amount of Reactor Makeup Water that will be necessary to add to complete the rod height adjustment.
- A1b This is a new JPM. The operator will be provided with a completed Surveillance Procedure and asked to complete the procedure in accordance with Section 10 of SOMP 04-02, "Procedure Use and Adherence." There will be four minor administrative errors, and two major errors associated with the acceptance criteria of the procedure. The operator will be required to identify at least three of the four minor errors, and identify and correct the major errors. Additionally, the operator will be required to evaluate the impact of the failed surveillance on Technical Specifications, and determine the action required.
- A2 This is a new JPM. The operator will be placed in a situation where severe a seal leak has just been discovered on the 1B NI Pump, and told that 1NI-149 has a history of seat leakage. The operator will be provided with a List of Suggested Tagged Components that has previously been prepared, and then asked to verify the mechanical and electrical isolation boundaries needed to isolate the 1B NI Pump, including the components, their isolated positions and the sequence in which they are to be manipulated. There will be three errors that the operator will need to identify and correct.
- A3 This is a new JPM. The operator will be told that a General Emergency has been declared and that he, as the OSM, has initiated and completed the immediate actions of Enclosure 4.1 of RP/0/A/5700/004, "General Emergency." Additionally, the operator will be told that he is presently considering On-Site Protective Actions in accordance with Step 3.8.2 of RP/0/A/5700/004, and that there are reports of an injured non-ambulatory person on-site. The operator will be required to select two rescuers, from among seven potential rescuers, and dispatch them to the injured individual by completing Enclosure 4.4, "Request for Emergency Exposure," of RP/0/A/5700/004.
- A4 This is a new JPM. The operator will be told that a General Emergency has been declared, that there is an on-going radiation release, and given an initial set of meteorological data. The operator will be required to make an initial Protective Action Recommendation and complete the Notification Form within 15 minutes. This is a Time Critical JPM.

JPM A1a RO/SRO

Facility: McGuire Task No.: 209MNV002

Task Title: Calculate Dilution Needed for a Specified Rod Change JPM No.: 2008 Admin - JPM A1a RO/SRO

K/A Reference: GK/A 2.1.25 (3.9/4.2)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- Unit #1 Reactor Power is at 100%, Steady State.
 - Core burnup is 124 EFPD
 - NC Boron Concentration = 1000 PPM
 - Present Control Rods Bank "D" at 220 steps
 - Desired Rod Height is Control Rods Bank "D" at 170 steps

Task Standard: Dilution of approximately **1361 gallons** is calculated within \pm 50 gallons. All critical tasks evaluated as satisfactory.

Required Materials: Calculator

General References: OP/1/A/6150/009, Boron Concentration Control
OP/1/A/6100/22, Unit 1 Data Book

Handouts: OP/1/A/6100/22, Unit 1 Data Book

Initiating Cue: The CRSRO has directed you to manually calculate the minimum amount of reactor makeup water needed to obtain the desired Control Rod Height **using the McGuire Data Book.**

Time Critical Task: NO

Validation Time: 20 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout the Unit 1 Data Book (OP/1/A/6100/22).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Operator determines 220 steps integral rod worth using the 51-125 EFPD column of OP/1/A/6100/22, Enclosure 4.3, Table 6.3.3, IRW in Overlap, HFP, Equilibrium Xe.	Initial inserted reactivity worth = <u>5 pcm</u>		
*2	Operator determines 170 steps integral rod worth using the 51-125 EFPD column of OP/1/A/6100/22, Enclosure 4.3, Table 6.3.3, IRW in Overlap, HFP, Equilibrium Xe.	Desired Rod height inserted reactivity worth = <u>130 pcm</u>		
*3	Operator determines the change in reactivity required for the rod insertion	Change in reactivity to be compensated to rod insertion = 130 pcm <u>-5 pcm</u> 125 pcm		
*4	Using OP/1/A/6100/22, Enclosure 4.3, Graph 6.11 Differential Boron Worth (HFP, ARO, Eq Xe, Eq Sm) determines the Differential Boron Worth for present conditions (124 EFPD)	Operator determines the Differential Boron Worth from the graph to be = <u>-6.31 pcm/ppm</u>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Using the Differential Boron Worth and the Change in reactivity, determines the change in Boron Concentration	Operator determines the change in Boron Concentration to be = <u>$125 / -6.31 \text{ pcm/ppm}$</u> = <u>$-19.8 \text{ ppm}$</u>		
6	Operator determines Boron Concentration change required	Change in Boron = <u>$1000 - 19.8 \text{ ppm}$</u> = <u>980.2 ppm</u>		
*7	Using OP/1/A/6100/22, Enclosure 4.3 Section 5.1 Boron and Dilution Tables, determines the Reactor Makeup Water addition	Using Present Boron Concentration 1000 ppm and the Desired Boron Concentration of 980 ppm, determines from Table that change from 1000-980 ppm will require the addition of 1361 ± 50 gallons of reactor makeup water. Total Makeup Water to add = 1361 ± 50 gallons.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A1a RO/SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit #1 Reactor Power is at 100%, Steady State.
- Core burnup is 124 EFPD
- NC Boron Concentration = 1000 PPM
- Present Control Rods Bank "D" at 220 steps
- Desired Rod Height is Control Rods Bank "D" at 170 steps

INITIATING CUE:

The CRSRO has directed you to manually calculate the minimum amount of reactor makeup water needed to obtain the desired Control Rod Height **using the McGuire Data Book.**

UNIT 1

OP/17A/6100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon

chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD IRW (PCM)	51 - 125 EFPD IRW (PCM)	126 - 175 EFPD IRW (PCM)	176 - 250 EFPD IRW (PCM)	251 - 325 EFPD IRW (PCM)	326 - 400 EFPD IRW (PCM)	401 - EOW IRW (PCM)
Bk A	Bk B	Bk C	Bk D							
226	226	226	226	0	0	0	0	0	0	0
226	226	226	225	1	1	1	1	1	2	2
226	226	226	220	7	5	5	6	8	10	13
226	226	226	215	14	10	10	12	15	18	23
226	226	226	210	20	14	14	17	22	26	34
226	226	226	205	36	27	28	31	40	45	56
226	226	226	200	52	39	41	46	57	64	78
226	226	226	195	67	52	54	60	74	83	100
226	226	226	190	83	65	67	74	91	102	122
226	226	226	185	101	81	84	92	111	123	145
226	226	226	180	119	97	100	109	131	144	168
226	226	226	175	137	113	117	127	151	165	191
226	226	226	170	155	130	133	144	171	186	214
	226	226	165	173	147	150	161	190	205	235
	226	226	160	191	164	167	179	209	224	255
226	226	226	155	209	181	184	196	227	243	275
226	226	226	150	227	198	201	214	246	263	295
226	226	226	145	244	215	217	230	263	280	312
226	226	226	140	262	231	234	247	280	297	330
226	226	226	135	279	248	250	263	297	314	348
226	226	226	130	297	265	267	280	314	331	365
226	226	226	125	314	281	283	295	329	346	381
226	226	226	120	331	298	299	311	345	362	397
226	226	226	116	345	311	312	324	357	374	410
226	226	226	110	365	331	331	342	375	392	427
226	226	221	105	388	351	350	361	396	414	453
226	226	216	100	410	371	370	381	417	436	478
226	226	211	95	446	402	401	413	454	476	523
226	226	206	90	481	434	433	446	491	515	567
226	226	201	85	517	465	464	478	528	555	612

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OFFICIAL COPY
Enclosure 4.3 - Table 6.3.3
Integral Rod Worth in Overlap
HFP, Equilibrium Xenon

Chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD	51 - 125 EFPD	126 - 175 EFPD	176 - 250 EFPD	251 - 325 EFPD	326 - 400 EFPD	401 - EOW
Bk A	Bk B	Bk C	Bk D	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)
226	226	196	80	553	496	496	511	564	594	656
226	226	191	75	592	535	535	552	610	642	707
226	226	186	70	631	573	575	593	656	689	758
226	226	181	65	670	612	614	634	701	737	809
226	226	176	60	709	650	654	676	747	784	860
226	226	171	55	750	693	697	720	794	832	909
226	226	166	50	791	735	740	764	840	880	958
226	226	161	45	832	777	783	808	887	927	1007
226	226	156	40	873	820	826	853	934	975	1056
226	226	151	35	916	863	870	897	980	1021	1102
226	226	146	30	959	907	914	942	1026	1068	1149
226	226	141	25	1002	951	958	987	1073	1114	1196
226	226	136	20	1045	994	1002	1032	1119	1161	1243
226	226	131	15	1083	1033	1041	1071	1158	1200	1283
226	226	126	10	1121	1072	1080	1110	1198	1240	1323
226	226	121	5	1158	1110	1119	1149	1237	1279	1363
226	226	116	0	1196	1149	1158	1188	1276	1319	1403
226	226	110	0	1228	1187	1197	1227	1313	1355	1439
226	221	105	0	1258	1220	1230	1260	1348	1390	1476
226	216	100	0	1288	1254	1264	1294	1382	1425	1514
226	211	95	0	1327	1296	1307	1338	1428	1474	1566
226	206	90	0	1366	1338	1350	1382	1475	1522	1619
226	201	85	0	1405	1379	1393	1425	1521	1570	1672
226	196	80	0	1444	1421	1436	1469	1568	1618	1724
226	191	75	0	1487	1469	1486	1520	1622	1674	1782
226	186	70	0	1530	1518	1535	1571	1675	1729	1840
226	181	65	0	1572	1566	1585	1622	1729	1784	1898
226	176	60	0	1615	1614	1635	1673	1783	1839	1956
226	171	55	0	1662	1666	1689	1729	1840	1897	2014
226	166	50	0	1708	1719	1744	1785	1897	1954	2072

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OP/1/A/6100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon

chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD	51 - 125 EFPD	126 - 175 EFPD	176 - 250 EFPD	251 - 325 EFPD	326 - 400 EFPD	401 - EOW
Bk A	Bk B	Bk C	Bk D	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)
226	161	45	0	1755	1771	1798	1840	1954	2012	2130
226	156	40	0	1802	1823	1853	1896	2011	2069	2188
226	151	35	0	1851	1876	1907	1952	2068	2127	2246
226	146	30	0	1901	1929	1961	2008	2125	2185	2304
226	141	25	0	1951	1981	2016	2064	2183	2242	2362
226	136	20	0	2000	2034	2070	2120	2240	2300	2420
226	131	15	0	2044	2076	2113	2163	2285	2346	2467
226	126	10	0	2088	2118	2155	2206	2330	2392	2514
226	121	5	0	2131	2160	2198	2250	2375	2437	2560
226	116	0	0	2175	2202	2240	2293	2421	2483	2607
226	110	0	0	2202	2233	2273	2326	2454	2518	2643
221	105	0	0	2228	2262	2302	2356	2486	2550	2678
216	100	0	0	2254	2291	2331	2386	2518	2583	2714
211	95	0	0	2290	2327	2369	2425	2559	2626	2759
	90	0	0	2325	2364	2407	2464	2601	2669	2805
	85	0	0	2360	2401	2445	2503	2642	2711	2851
196	80	0	0	2396	2438	2483	2542	2684	2754	2897
191	75	0	0	2434	2480	2527	2587	2731	2802	2945
186	70	0	0	2473	2523	2571	2632	2778	2850	2994
181	65	0	0	2512	2565	2615	2677	2824	2897	3043
176	60	0	0	2550	2607	2658	2722	2871	2945	3092
171	55	0	0	2591	2652	2705	2770	2920	2993	3140
166	50	0	0	2632	2697	2752	2818	2968	3042	3188
161	45	0	0	2673	2742	2798	2866	3017	3090	3236
156	40	0	0	2714	2787	2845	2914	3065	3139	3284
151	35	0	0	2755	2829	2889	2959	3111	3185	3329
146	30	0	0	2796	2872	2932	3003	3157	3231	3375
141	25	0	0	2838	2915	2976	3048	3203	3277	3421
136	20	0	0	2879	2957	3020	3093	3249	3323	3466
131	15	0	0	2913	2989	3051	3125	3280	3354	3498

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

Enclosure 4.3 - Table 6.3.3
Integral Rod Worth in Overlap
HFP, Equilibrium Xenon

Chg AH

Unit 1 Cycle 19

Control Bank Position Steps Withdrawn *				4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
				0 - 50 EFPD	51 - 125 EFPD	126 - 175 EFPD	176 - 250 EFPD	251 - 325 EFPD	326 - 400 EFPD	401 - EOW
Bk A	Bk B	Bk C	Bk D	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)	IRW (PCM)
126	10	0	0	2947	3020	3083	3156	3312	3386	3530
121	5	0	0	2981	3052	3114	3187	3343	3417	3562
116	0	0	0	3015	3083	3145	3219	3375	3448	3594
110	0	0	0	3036	3106	3167	3240	3394	3468	3612
105	0	0	0	3052	3123	3185	3257	3410	3482	3627
100	0	0	0	3069	3141	3202	3273	3425	3497	3641
95	0	0	0	3085	3159	3219	3290	3439	3511	3654
90	0	0	0	3101	3176	3236	3306	3454	3525	3668
85	0	0	0	3117	3194	3253	3322	3469	3540	3681
80	0	0	0	3133	3211	3270	3338	3483	3554	3695
75	0	0	0	3148	3228	3286	3354	3497	3567	3706
70	0	0	0	3163	3244	3303	3369	3510	3579	3718
65	0	0	0	3179	3261	3319	3384	3524	3592	3730
60	0	0	0	3194	3277	3335	3400	3537	3605	3742
55	0	0	0	3209	3293	3350	3414	3551	3618	3754
50	0	0	0	3225	3309	3366	3429	3564	3631	3765
45	0	0	0	3240	3324	3381	3444	3577	3643	3777
40	0	0	0	3256	3340	3397	3459	3590	3656	3789
35	0	0	0	3271	3354	3410	3472	3603	3668	3800
30	0	0	0	3286	3367	3423	3485	3615	3680	3810
25	0	0	0	3301	3381	3436	3498	3628	3692	3821
20	0	0	0	3317	3394	3450	3512	3640	3704	3832
15	0	0	0	3327	3401	3456	3518	3647	3711	3839
10	0	0	0	3336	3408	3463	3525	3654	3718	3847
5	0	0	0	3346	3414	3469	3532	3661	3724	3854
0	0	0	0	3356	3421	3475	3539	3667	3731	3861

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

OP/1/A/6100/022
 Enclosure 4.3 - Table 6.3.3
 Integral Rod Worth in Overlap
 HFP, Equilibrium Xenon
 Unit 1 Cycle 19

Shutdown Bank	Bank Position SWD	4 EFPD	100 EFPD	150 EFPD	200 EFPD	300 EFPD	350 EFPD	450 EFPD
		0 - 50 EFPD IRW (PCM)	51 - 125 EFPD IRW (PCM)	126 - 175 EFPD IRW (PCM)	176 - 250 EFPD IRW (PCM)	251 - 325 EFPD IRW (PCM)	326 - 400 EFPD IRW (PCM)	401 - EOW IRW (PCM)
SDE	226	0	0	0	0	0	0	0
	220	4	5	5	3	5	6	6
	200	59	47	49	51	65	73	87
	0	756	747	747	744	751	757	773
SDD	226	0	0	0	0	0	0	0
	220	4	5	4	5	6	6	7
	200	55	45	45	51	64	72	88
	0	692	730	749	770	809	826	855
SDC	226	0	0	0	0	0	0	0
	220	4	4	3	4	6	6	7
	200	59	48	49	55	70	79	96
	0	773	822	846	872	917	934	960
SDB	226	0	0	0	0	0	0	0
	220	6	5	5	6	7	8	11
	200	85	68	72	80	103	115	142
	0	1239	1225	1238	1258	1308	1334	1387
SDA	226	0	0	0	0	0	0	0
	220	1	1	1	1	2	3	5
	200	24	20	21	25	37	44	63
	0	377	346	358	387	474	527	649

*NOTE: For actual ALL Rods out Overlap Data, see Enclosure 4.3, Section 1.13 of the Data Book

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	10	20	30	40	50	60	70	80	90	100	110
10	0	46710	74033	93420	108457	120743	131131	140129	148067	155167	161589
20	96	0	27323	46710	61747	74033	84421	93420	101357	108457	114880
30	193	97	0	19386	34424	46710	57098	66096	74033	81133	87556
40	290	193	97	0	15037	27323	37711	46710	54647	61747	68170
50	387	290	194	97	0	12286	22674	31673	39610	46710	53133
60	484	387	291	194	97	0	10388	19386	27323	34424	40846
70	581	484	388	291	194	97	0	8998	16936	24036	30458
80	678	582	485	388	292	194	97	0	7937	15037	21460
90	776	679	583	486	389	292	195	97	0	7100	13523
100	873	777	680	583	487	390	292	195	98	0	6423
110	971	875	778	681	584	487	390	293	195	98	0
120	1069	972	876	779	682	585	488	391	293	196	98
130	1167	1070	974	877	780	683	586	489	391	294	196
140	1265	1169	1072	975	781	684	587	489	392	294	196
150	1363	1267	1170	1074	782	685	588	489	392	294	196
160	1462	1365	1269	1172	783	686	589	490	392	294	196
170	1560	1464	1367	1271	784	687	589	491	392	294	196
180	1659	1563	1466	1369	785	688	590	491	392	294	196
190	1758	1662	1565	1468	786	689	591	492	392	294	196
200	1857	1761	1664	1567	787	690	592	492	392	294	196
210	1956	1860	1763	1666	788	691	593	493	392	294	196
220	2056	1959	1862	1766	789	692	594	493	392	294	196
230	2155	2059	1962	1865	790	693	595	494	392	294	196
240	2255	2158	2062	1965	791	694	596	494	392	294	196
250	2354	2258	2161	2065	792	695	597	495	392	294	196
260	2454	2358	2261	2164	793	696	598	495	392	294	196
270	2554	2458	2361	2265	794	697	599	496	392	294	196
280	2655	2558	2461	2365	795	698	600	496	392	294	196
290	2755	2658	2562	2465	796	699	601	497	392	294	196
300	2855	2759	2662	2566	797	700	602	497	392	294	196
310	2956	2860	2763	2666	798	701	603	498	392	294	196
320	3057	2960	2864	2767	799	702	604	498	392	294	196
330	3158	3061	2965	2868	800	703	605	499	392	294	196
340	3259	3162	3066	2969	801	704	606	499	392	294	196
350	3360	3264	3167	3070	802	705	607	500	392	294	196
360	3462	3365	3269	3172	803	706	608	500	392	294	196
370	3563	3467	3370	3273	804	707	609	501	392	294	196
380	3665	3568	3472	3375	805	708	610	501	392	294	196
390	3767	3670	3574	3477	806	709	611	502	392	294	196
400	3869	3772	3676	3579	807	710	612	502	392	294	196
410	3971	3875	3778	3681	808	711	613	503	392	294	196
420	4073	3977	3880	3783	809	712	614	503	392	294	196
430	4176	4079	3983	3886	810	713	615	504	392	294	196
440	4278	4182	4085	3989	811	714	616	504	392	294	196
450	4381	4285	4188	4091	812	715	617	505	392	294	196
460	4484	4388	4291	4194	813	716	618	505	392	294	196
470	4587	4491	4394	4298	814	717	619	506	392	294	196
480	4691	4594	4498	4401	815	718	620	506	392	294	196
490	4794	4698	4601	4504	816	719	621	507	392	294	196
500	4898	4801	4705	4608	817	720	622	507	392	294	196

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	100	110	120	130	140	150	160	170	180	190	200
10	155167	161589	167453	172847	177841	182490	186839	190925	194776	198420	201876
20	108457	114880	120743	126137	131131	135780	140129	144215	148067	151710	155167
30	81133	87556	93420	98814	103808	108457	112806	116891	120743	124387	127843
40	61747	68170	74033	79427	84421	89070	93420	97505	101357	105000	108457
50	46710	53133	58996	64390	69384	74033	78382	82468	86320	89963	93420
60	34424	40846	46710	52104	57098	61747	66096	70181	74033	77677	81133
70	24036	30458	36322	41716	46710	51359	55708	59794	63645	67289	70745
80	15037	21460	27323	32717	37711	42361	46710	50795	54647	58290	61747
90	7100	13523	19386	24780	29774	34424	38773	42858	46710	50353	53810
100	0	6423	12286	17680	22674	27323	31673	35758	39610	43253	46710
110	98	0	5864	11257	16251	20901	25250	29335	33187	36830	40287
120	196	98	0	5394	10388	15037	19386	23472	27323	30967	34424
130	294	196	98	0	4994	9643	13992	18078	21930	25573	29030
140	392	294	196	98	0	4649	8998	13084	16936	20579	24036
150	490	392	294	196	98	0	4349	8434	12286	15930	19386
160	589	491	393	295	197	98	0	4085	7937	11581	15037
170	687	589	492	394	295	197	99	0	3852	7495	10952
180	786	688	590	492	394	296	197	99	0	3643	7100
190	885	787	689	591	493	395	296	198	99	0	3457
200	984	886	788	690	592	494	395	297	198	99	0
210	1083	985	887	789	691	593	494	396	297	198	99
220	1182	1085	987	889	790	692	594	495	396	298	198
230	1282	1184	1086	988	890	792	693	595	496	397	298
240	1381	1284	1186	1088	990	891	793	694	595	497	398
250	1481	1383	1286	1187	1089	991	893	794	695	596	497
260	1581	1483	1385	1287	1189	1091	992	894	795	696	597
270	1681	1583	1485	1387	1289	1191	1093	994	795	696	597
280	1781	1684	1586	1488	1389	1291	1193	1094	795	696	597
290	1882	1784	1686	1588	1490	1392	1293	1195	1096	997	898
300	1982	1884	1787	1689	1590	1492	1394	1295	1196	1097	998
310	2083	1985	1887	1789	1691	1593	1494	1396	1297	1198	1099
320	2184	2086	1988	1890	1792	1694	1595	1496	1398	1299	1200
330	2285	2187	2089	1991	1893	1794	1696	1597	1499	1400	1301
340	2386	2288	2190	2092	1994	1896	1797	1699	1600	1501	1402
350	2487	2389	2291	2193	2095	1997	1898	1800	1701	1602	1503
360	2588	2491	2393	2295	2197	2098	2000	1901	1802	1704	1605
370	2690	2592	2494	2396	2298	2200	2101	2003	1904	1805	1706
380	2792	2694	2596	2498	2400	2302	2203	2104	2006	1907	1808
390	2893	2796	2698	2600	2502	2403	2305	2206	2108	2009	1910
400	2996	2898	2800	2702	2604	2505	2407	2308	2210	2111	2012
410	3098	3000	2902	2804	2706	2608	2509	2411	2312	2213	2114
420	3200	3102	3004	2906	2808	2710	2611	2513	2414	2315	2216
430	3303	3205	3107	3009	2911	2812	2714	2615	2517	2418	2319
440	3405	3307	3210	3112	3013	2915	2817	2718	2619	2520	2421
450	3508	3410	3312	3214	3116	3018	2919	2821	2722	2623	2524
460	3611	3513	3415	3317	3219	3121	3022	2924	2825	2726	2627
470	3714	3616	3518	3420	3322	3224	3126	3027	2928	2829	2730
480	3817	3720	3622	3524	3426	3327	3229	3130	3031	2933	2834
490	3921	3823	3725	3627	3529	3431	3332	3234	3135	3036	2937
500	4024	3927	3829	3731	3633	3534	3436	3337	3238	3140	3041

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	200	210	220	230	240	250	260	270	280	290	300
10	201876	205164	208299	211295	214163	216914	219557	222100	224551	226915	229200
20	155167	158454	161589	164585	167453	170204	172847	175390	177841	180206	182490
30	127843	131131	134266	137261	140129	142880	145523	148067	150517	152882	155167
40	108457	111745	114880	117875	120743	123494	126137	128680	131131	133496	135780
50	93420	96707	99842	102838	105706	108457	111100	113643	116094	118459	120743
60	81133	84421	87556	90552	93420	96171	98814	101357	103808	106172	108457
70	70745	74033	77168	80164	83032	85783	88426	90969	93420	95784	98069
80	61747	65035	68170	71165	74033	76784	79427	81970	84421	86786	89070
90	53810	57098	60233	63228	66096	68847	71490	74033	76484	78849	81133
100	46710	49998	53133	56128	58996	61747	64390	66933	69384	71749	74033
110	40287	43575	46710	49705	52573	55324	57967	60510	62961	65326	67611
120	34424	37711	40846	43842	46710	49461	52104	54647	57098	59462	61747
130	29030	32317	35452	38448	41316	44067	46710	49253	51704	54069	56353
140	24036	27323	30458	33454	36322	39073	41716	44259	46710	49075	51359
150	19386	22674	25809	28805	31673	34424	37067	39610	42061	44425	46710
160	15037	18325	21460	24455	27323	30074	32717	35261	37711	40076	42361
170	10952	14240	17375	20370	23238	25989	28632	31175	33626	35991	38275
180	7100	10388	13523	16518	19386	22137	24780	27323	29774	32139	34424
190	3457	6744	9879	12875	15743	18494	21137	23680	26131	28495	30780
200	0	3288	6423	9418	12286	15037	17680	20223	22674	25039	27323
210	99	0	3135	6130	8998	11749	14392	16936	19386	21751	24036
220	198	99	0	2996	5864	8614	11257	13801	16251	18616	20901
230	298	199	99	0	2868	5619	8262	10805	13256	15621	17905
240	398	298	199	100	0	2751	5394	7937	10388	12753	15037
250	497	398	299	199	100	0	2643	5186	7637	10002	12286
260	597	498	399	299	200	100	0	2543	4994	7359	9643
270	697	598	499	399	300	200	100	0	2451	4815	7100
280	798	698	599	500	400	300	200	100	0	2365	4649
290	898	799	699	600	500	401	301	201	100	0	2285
300	998	899	800	700	601	501	401	301	201	101	0
310	1099	1000	901	801	701	602	502	402	302	201	101
320	1200	1101	1001	902	802	702	603	503	402	302	201
330	1301	1202	1102	1003	903	803	704	603	503	403	302
340	1402	1303	1203	1104	1004	905	805	705	604	504	404
350	1503	1404	1305	1205	1106	1006	906	806	706	605	505
360	1605	1505	1406	1307	1207	1107	1007	907	807	707	606
370	1706	1607	1508	1408	1309	1209	1109	1009	909	808	708
380	1808	1709	1609	1510	1410	1311	1211	1111	1010	910	809
390	1910	1811	1711	1612	1512	1412	1312	1212	1112	1012	911
400	2012	1913	1813	1714	1614	1514	1414	1314	1214	1114	1013
410	2114	2015	1915	1816	1716	1617	1517	1417	1316	1216	1116
420	2216	2117	2018	1918	1819	1719	1619	1519	1419	1318	1218
430	2319	2220	2120	2021	1921	1821	1722	1621	1521	1421	1320
440	2421	2322	2223	2123	2024	1924	1824	1724	1624	1524	1423
450	2524	2425	2326	2226	2127	2027	1927	1827	1727	1626	1526
460	2627	2528	2429	2329	2230	2130	2030	1930	1830	1729	1629
470	2730	2631	2532	2432	2333	2233	2133	2033	1933	1832	1732
480	2834	2734	2635	2536	2436	2336	2236	2136	2036	1936	1835
490	2937	2838	2738	2639	2539	2440	2340	2240	2139	2039	1939
500	3041	2941	2842	2743	2643	2543	2443	2343	2243	2143	2042

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	300	310	320	330	340	350	360	370	380	390	400
110	67611	69820	71960	74033	76045	77998	79897	81743	83540	85291	86997
120	61747	63957	66096	68170	70181	72135	74033	75880	77677	79427	81133
130	56353	58563	60702	62776	64788	66741	68639	70486	72283	74033	75739
140	51359	53569	55708	57782	59794	61747	63645	65492	67289	69039	70745
150	46710	48919	51059	53133	55144	57098	58996	60842	62640	64390	66096
160	42361	44570	46710	48783	50795	52749	54647	56493	58290	60041	61747
170	38275	40485	42624	44698	46710	48663	50562	52408	54205	55956	57662
180	34424	36633	38773	40846	42858	44811	46710	48556	50353	52104	53810
190	30780	32990	35129	37203	39215	41168	43066	44913	46710	48460	50166
200	27323	29533	31673	33746	35758	37711	39610	41456	43253	45004	46710
210	24036	26245	28385	30458	32470	34424	36322	38168	39965	41716	43422
220	20901	23110	25250	27323	29335	31289	33187	35033	36830	38581	40287
230	17905	20115	22254	24328	26340	28293	30191	32038	33835	35585	37292
240	15037	17247	19386	21460	23472	25425	27323	29170	30967	32717	34424
250	12286	14496	16635	18709	20721	22674	24573	26419	28216	29966	31673
260	9643	11853	13992	16066	18078	20031	21930	23776	25573	27323	29030
270	7100	9310	11449	13523	15535	17488	19386	21233	23030	24780	26486
280	4649	6859	8998	11072	13084	15037	16936	18782	20579	22329	24036
290	2285	4494	6634	8707	10719	12672	14571	16417	18214	19965	21671
300	0	2210	4349	6423	8434	10388	12286	14133	15930	17680	19386
310	101	0	2139	4213	6225	8178	10077	11923	13720	15471	17177
320	201	101	0	2074	4085	6039	7937	9784	11581	13331	15037
330	302	202	101	0	2012	3965	5864	7710	9507	11257	12964
340	404	303	202	101	0	1953	3852	5698	7495	9246	10952
350	505	404	303	202	101	0	1898	3745	5542	7292	8998
360	606	506	405	304	203	101	0	1846	3643	5394	7100
370	708	607	506	405	304	203	102	0	1797	3548	5254
380	809	709	608	507	406	305	203	102	0	1750	3457
390	911	811	710	609	508	407	305	204	102	0	1706
400	1013	913	812	711	610	509	407	306	204	102	0
410	1116	1015	914	813	712	611	509	408	306	204	102
420	1218	1117	1016	915	814	713	612	510	408	307	205
430	1320	1220	1119	1018	917	816	714	613	511	409	307
440	1423	1322	1222	1121	1020	918	817	715	614	512	410
450	1526	1425	1324	1223	1122	1021	920	818	716	614	512
460	1629	1528	1427	1326	1225	1124	1023	921	819	717	615
470	1732	1631	1530	1429	1328	1227	1126	1024	922	821	719
480	1835	1735	1634	1533	1432	1330	1229	1127	1026	924	822
490	1939	1838	1737	1636	1535	1434	1332	1231	1129	1027	925
500	2042	1942	1841	1740	1639	1537	1436	1334	1233	1131	1029
510	2146	2045	1945	1844	1742	1641	1540	1438	1336	1235	1133
520	2250	2149	2048	1947	1846	1745	1644	1542	1440	1339	1237
530	2354	2253	2152	2052	1950	1849	1748	1646	1544	1443	1341
540	2458	2358	2257	2156	2055	1953	1852	1750	1649	1547	1445
550	2563	2462	2361	2260	2159	2058	1956	1855	1753	1651	1549
560	2667	2566	2466	2365	2264	2162	2061	1959	1858	1756	1654
570	2772	2671	2570	2469	2368	2267	2166	2064	1962	1861	1758
580	2877	2776	2675	2574	2473	2372	2271	2169	2067	1965	1863
590	2982	2881	2780	2679	2578	2477	2376	2274	2172	2070	1968
600	3087	2986	2886	2785	2683	2582	2481	2379	2278	2176	2074

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	400	410	420	430	440	450	460	470	480	490	500
210	43422	45086	46710	48295	49845	51359	52840	54289	55708	57098	58459
220	40287	41951	43575	45161	46710	48224	49705	51155	52573	53963	55324
230	37292	38956	40579	42165	43714	45229	46710	48159	49578	50967	52329
240	34424	36088	37711	39297	40846	42361	43842	45291	46710	48099	49461
250	31673	33337	34960	36546	38095	39610	41091	42540	43959	45348	46710
260	29030	30694	32317	33903	35452	36967	38448	39897	41316	42705	44067
270	26486	28150	29774	31360	32909	34424	35905	37354	38773	40162	41524
280	24036	25700	27323	28909	30458	31973	33454	34903	36322	37711	39073
290	21671	23335	24959	26544	28094	29608	31089	32538	33957	35347	36708
300	19386	21050	22674	24260	25809	27323	28805	30254	31673	33062	34424
310	17177	18841	20465	22050	23599	25114	26595	28044	29463	30852	32214
320	15037	16701	18325	19911	21460	22974	24455	25905	27323	28713	30074
330	12964	14628	16251	17837	19386	20901	22382	23831	25250	26639	28001
340	10952	12616	14240	15825	17375	18889	20370	21819	23238	24628	25989
350	8998	10662	12286	13872	15421	16936	18417	19866	21285	22674	24036
360	7100	8764	10388	11974	13523	15037	16518	17968	19386	20776	22137
370	5254	6918	8542	10127	11676	13191	14672	16121	17540	18929	20291
380	3457	5121	6744	8330	9879	11394	12875	14324	15743	17132	18494
390	1706	3370	4994	6580	8129	9643	11124	12574	13992	15382	16743
400	0	1664	3288	4874	6423	7937	9418	10868	12286	13676	15037
410	102	0	1624	3210	4759	6273	7754	9204	10622	12012	13373
420	205	102	0	1586	3135	4649	6130	7580	8998	10388	11749
430	307	205	102	0	1549	3064	4545	5994	7413	8802	10164
440	410	307	205	103	0	1514	2996	4445	5864	7253	8614
450	512	410	308	205	103	0	1481	2930	4349	5739	7100
460	615	513	411	308	206	103	0	1449	2868	4257	5619
470	719	616	514	412	309	206	103	0	1419	2808	4170
480	822	720	617	515	412	309	206	103	0	1389	2751
490	925	823	721	618	516	413	310	207	103	0	1361
500	1029	927	824	722	619	516	413	310	207	104	0
510	1133	1030	928	826	723	620	517	414	311	207	104
520	1237	1134	1032	930	827	724	621	518	415	311	208
530	1341	1238	1136	1034	931	828	725	622	519	415	312
540	1445	1343	1240	1138	1035	932	829	726	623	520	416
550	1549	1447	1345	1242	1140	1037	934	831	727	624	520
560	1654	1552	1449	1347	1244	1141	1038	935	832	729	625
570	1758	1656	1554	1451	1349	1246	1143	1040	937	833	730
580	1863	1761	1659	1556	1454	1351	1248	1145	1042	938	835
590	1968	1866	1764	1661	1559	1456	1353	1250	1147	1043	940
600	2074	1971	1869	1767	1664	1561	1458	1355	1252	1148	1045
610	2179	2077	1975	1872	1769	1667	1564	1460	1357	1254	1150
620	2285	2182	2080	1978	1875	1772	1669	1566	1463	1359	1256
630	2390	2288	2186	2083	1981	1878	1775	1672	1568	1465	1361
640	2496	2394	2292	2189	2086	1984	1881	1778	1674	1571	1467
650	2602	2500	2398	2295	2193	2090	1987	1884	1780	1677	1573
660	2708	2606	2504	2401	2299	2196	2093	1990	1887	1783	1680
670	2815	2713	2610	2508	2405	2302	2199	2096	1993	1890	1786
680	2921	2819	2717	2614	2512	2409	2306	2203	2099	1996	1892
690	3028	2926	2823	2721	2618	2516	2413	2309	2206	2103	1999
700	3135	3033	2930	2828	2725	2622	2519	2416	2313	2210	2106

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	500	510	520	530	540	550	560	570	580	590	600
310	32214	33548	34857	36141	37400	38637	39851	41044	42216	43368	44500
320	30074	31409	32717	34001	35261	36497	37711	38904	40076	41228	42361
330	28001	29335	30644	31927	33187	34424	35638	36830	38002	39154	40287
340	25989	27323	28632	29916	31175	32412	33626	34819	35991	37143	38275
350	24036	25370	26679	27962	29222	30458	31673	32865	34037	35189	36322
360	22137	23472	24780	26064	27323	28560	29774	30967	32139	33291	34424
370	20291	21625	22934	24217	25477	26714	27928	29121	30293	31445	32577
380	18494	19828	21137	22420	23680	24917	26131	27323	28495	29647	30780
390	16743	18078	19386	20670	21930	23166	24380	25573	26745	27897	29030
400	15037	16372	17680	18964	20223	21460	22674	23867	25039	26191	27323
410	13373	14708	16016	17300	18559	19796	21010	22203	23375	24527	25659
420	11749	13084	14392	15676	16936	18172	19386	20579	21751	22903	24036
430	10164	11498	12807	14090	15350	16586	17801	18993	20165	21317	22450
440	8614	9949	11257	12541	13801	15037	16251	17444	18616	19768	20901
450	7100	8434	9743	11027	12286	13523	14737	15930	17102	18254	19386
460	5619	6953	8262	9546	10805	12042	13256	14449	15621	16773	17905
470	4170	5504	6813	8096	9356	10592	11807	12999	14171	15323	16456
480	2751	4085	5394	6678	7937	9174	10388	11581	12753	13905	15037
490	1361	2696	4004	5288	6548	7784	8998	10191	11363	12515	13648
500	0	1334	2643	3927	5186	6423	7637	8830	10002	11154	12286
510	104	0	1309	2592	3852	5088	6303	7495	8667	9819	10952
520	208	104	0	1284	2543	3780	4994	6187	7359	8511	9643
530	312	208	104	0	1260	2496	3710	4903	6075	7227	8360
540	416	312	208	104	0	1237	2451	3643	4815	5967	7100
550	520	417	313	209	104	0	1214	2407	3579	4731	5864
560	625	521	417	313	209	105	0	1193	2365	3517	4649
570	730	626	522	418	314	209	105	0	1172	2324	3457
580	835	731	627	523	419	314	210	105	0	1152	2285
590	940	836	732	628	524	419	315	210	105	0	1133
600	1045	941	837	733	629	524	420	315	210	105	0
610	1150	1046	943	838	734	630	525	421	316	211	105
620	1256	1152	1048	944	840	735	631	526	421	316	211
630	1361	1258	1154	1050	945	841	736	632	527	422	317
640	1467	1364	1260	1156	1051	947	842	738	633	528	422
650	1573	1470	1366	1262	1157	1053	948	844	739	634	529
660	1680	1576	1472	1368	1264	1159	1055	950	845	740	635
670	1786	1682	1578	1474	1370	1266	1161	1056	951	846	741
680	1892	1789	1685	1581	1476	1372	1268	1163	1058	953	848
690	1999	1895	1791	1687	1583	1479	1374	1270	1165	1060	954
700	2106	2002	1898	1794	1690	1586	1481	1376	1272	1166	1061
710	2213	2109	2005	1901	1797	1693	1588	1483	1379	1274	1168
720	2320	2217	2113	2009	1904	1800	1695	1591	1486	1381	1276
730	2428	2324	2220	2116	2012	1907	1803	1698	1593	1488	1383
740	2535	2432	2328	2224	2119	2015	1910	1806	1701	1596	1490
750	2643	2539	2435	2331	2227	2123	2018	1913	1808	1703	1598
760	2751	2647	2543	2439	2335	2231	2126	2021	1916	1811	1706
770	2859	2755	2651	2547	2443	2339	2234	2129	2024	1919	1814
780	2967	2863	2760	2656	2551	2447	2342	2238	2133	2028	1922
790	3076	2972	2868	2764	2660	2555	2451	2346	2241	2136	2031
800	3184	3081	2977	2873	2768	2664	2559	2455	2350	2245	2139

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	600	610	620	630	640	650	660	670	680	690	700
410	25659	26773	27869	28947	30009	31053	32082	33096	34094	35078	36047
420	24036	25149	26245	27323	28385	29430	30458	31472	32470	33454	34424
430	22450	23564	24660	25738	26799	27844	28873	29886	30884	31868	32838
440	20901	22015	23110	24189	25250	26295	27323	28337	29335	30319	31289
450	19386	20500	21596	22674	23735	24780	25809	26822	27821	28805	29774
460	17905	19019	20115	21193	22254	23299	24328	25341	26340	27323	28293
470	16456	17570	18666	19744	20805	21850	22879	23892	24890	25874	26844
480	15037	16151	17247	18325	19386	20431	21460	22473	23472	24455	25425
490	13648	14762	15857	16936	17997	19042	20070	21084	22082	23066	24036
500	12286	13400	14496	15574	16635	17680	18709	19722	20721	21705	22674
510	10952	12066	13161	14240	15301	16346	17375	18388	19386	20370	21340
520	9643	10757	11853	12931	13992	15037	16066	17079	18078	19062	20031
530	8360	9474	10569	11648	12709	13754	14782	15796	16794	17778	18748
540	7100	8214	9310	10388	11449	12494	13523	14536	15535	16518	17488
550	5864	6977	8073	9151	10213	11257	12286	13300	14298	15282	16251
560	4649	5763	6859	7937	8998	10043	11072	12085	13084	14068	15037
570	3457	4570	5666	6744	7806	8850	9879	10893	11891	12875	13844
580	2285	3398	4494	5572	6634	7678	8707	9721	10719	11703	12672
590	1133	2246	3342	4420	5482	6527	7555	8569	9567	10551	11521
600	0	1114	2210	3288	4349	5394	6423	7436	8434	9418	10388
610	105	0	1096	2174	3235	4280	5309	6322	7321	8304	9274
620	211	106	0	1078	2139	3184	4213	5226	6225	7209	8178
630	317	211	106	0	1061	2106	3135	4148	5147	6130	7100
640	422	317	212	106	0	1045	2074	3087	4085	5069	6039
650	529	423	318	212	106	0	1029	2042	3041	4024	4994
660	635	529	424	318	212	106	0	1013	2012	2996	3965
670	741	636	530	424	319	213	106	0	998	1982	2952
680	848	742	637	531	425	319	213	107	0	984	1953
690	954	849	743	638	532	426	320	213	107	0	970
700	1061	956	850	745	639	533	427	320	214	107	0
710	1168	1063	957	852	746	640	534	427	321	214	107
720	1276	1170	1065	959	853	747	641	534	428	321	214
730	1383	1278	1172	1066	960	854	748	642	535	429	322
740	1490	1385	1280	1174	1068	962	856	749	643	536	429
750	1598	1493	1387	1282	1176	1070	963	857	751	644	537
760	1706	1601	1495	1389	1284	1178	1071	965	858	752	645
770	1814	1709	1603	1498	1392	1286	1179	1073	967	860	753
780	1922	1817	1712	1606	1500	1394	1288	1181	1075	968	861
790	2031	1926	1820	1714	1608	1502	1396	1290	1183	1077	970
800	2139	2034	1929	1823	1717	1611	1505	1398	1292	1185	1078
810	2248	2143	2037	1932	1826	1720	1614	1507	1401	1294	1187
820	2357	2252	2146	2041	1935	1829	1722	1616	1510	1403	1296
830	2466	2361	2255	2150	2044	1938	1832	1725	1619	1512	1405
840	2576	2470	2365	2259	2153	2047	1941	1835	1728	1621	1514
850	2685	2580	2474	2369	2263	2157	2050	1944	1837	1731	1624
860	2795	2689	2584	2478	2372	2266	2160	2054	1947	1840	1734
870	2905	2799	2694	2588	2482	2376	2270	2164	2057	1950	1843
880	3015	2909	2804	2698	2592	2486	2380	2274	2167	2060	1953
890	3125	3019	2914	2808	2702	2596	2490	2384	2277	2170	2064
900	3235	3130	3024	2919	2813	2707	2601	2494	2388	2281	2174

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	700	710	720	730	740	750	760	770	780	790	800
510	21340	22296	23238	24168	25084	25989	26882	27762	28632	29490	30338
520	20031	20987	21930	22859	23776	24680	25573	26454	27323	28182	29030
530	18748	19703	20646	21575	22492	23397	24289	25170	26040	26898	27746
540	17488	18444	19386	20316	21233	22137	23030	23911	24780	25639	26486
550	16251	17207	18150	19079	19996	20901	21793	22674	23544	24402	25250
560	15037	15993	16936	17865	18782	19686	20579	21460	22329	23188	24036
570	13844	14800	15743	16672	17589	18494	19386	20267	21137	21995	22843
580	12672	13628	14571	15500	16417	17322	18214	19095	19965	20823	21671
590	11521	12476	13419	14348	15265	16170	17062	17943	18813	19671	20519
600	10388	11344	12286	13216	14133	15037	15930	16811	17680	18539	19386
610	9274	10230	11172	12102	13019	13923	14816	15697	16566	17425	18272
620	8178	9134	10077	11006	11923	12828	13720	14601	15471	16329	17177
630	7100	8056	8998	9928	10845	11749	12642	13523	14392	15251	16098
640	6039	6995	7937	8867	9784	10688	11581	12462	13331	14190	15037
650	4994	5950	6892	7822	8739	9643	10536	11417	12286	13145	13992
660	3965	4921	5864	6793	7710	8614	9507	10388	11257	12116	12964
670	2952	3908	4850	5780	6697	7601	8494	9375	10244	11103	11950
680	1953	2909	3852	4781	5698	6603	7495	8376	9246	10104	10952
690	970	1926	2868	3798	4714	5619	6511	7392	8262	9120	9968
700	0	956	1898	2828	3745	4649	5542	6423	7292	8151	8998
710	107	0	943	1872	2789	3693	4586	5467	6336	7195	8043
720	214	107	0	930	1846	2751	3643	4524	5394	6252	7100
730	322	215	107	0	917	1821	2714	3595	4464	5323	6171
740	429	322	215	108	0	905	1797	2678	3548	4406	5254
750	537	430	323	215	108	0	893	1773	2643	3501	4349
760	645	538	431	323	216	108	0	881	1750	2609	3457
770	753	646	539	431	324	216	108	0	870	1728	2576
780	861	754	647	540	432	324	216	108	0	858	1706
790	970	863	755	648	540	433	325	217	108	0	848
800	1078	971	864	757	649	541	433	325	217	109	0
810	1187	1080	973	865	758	650	542	434	326	217	109
820	1296	1189	1082	974	867	759	651	543	435	326	218
830	1405	1298	1191	1083	976	868	760	652	544	435	327
840	1514	1407	1300	1193	1085	977	870	761	653	545	436
850	1624	1517	1410	1302	1195	1087	979	871	763	654	546
860	1734	1626	1519	1412	1304	1197	1089	981	872	764	655
870	1843	1736	1629	1522	1414	1306	1199	1090	982	874	765
880	1953	1846	1739	1632	1524	1416	1309	1200	1092	984	875
890	2064	1957	1849	1742	1634	1527	1419	1311	1202	1094	985
900	2174	2067	1960	1852	1745	1637	1529	1421	1313	1204	1096
910	2285	2178	2070	1963	1855	1748	1640	1532	1423	1315	1206
920	2395	2288	2181	2074	1966	1858	1750	1642	1534	1426	1317
930	2506	2399	2292	2185	2077	1969	1861	1753	1645	1537	1428
940	2617	2510	2403	2296	2188	2080	1972	1864	1756	1648	1539
950	2729	2622	2514	2407	2299	2192	2084	1976	1867	1759	1650
960	2840	2733	2626	2518	2411	2303	2195	2087	1979	1870	1762
970	2952	2845	2738	2630	2523	2415	2307	2199	2091	1982	1874
980	3064	2957	2849	2742	2634	2527	2419	2311	2202	2094	1985
990	3176	3069	2961	2854	2746	2639	2531	2423	2314	2206	2097
1000	3288	3181	3074	2966	2859	2751	2643	2535	2427	2318	2210

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied

PRESENT BORON CONCENTRATION (ppmB)

	800	810	820	830	840	850	860	870	880	890	900
610	18272	19110	19936	20753	21560	22358	23146	23925	24695	25457	26210
620	17177	18014	18841	19657	20465	21262	22050	22829	23599	24361	25114
630	16098	16936	17762	18579	19386	20184	20972	21751	22521	23283	24036
640	15037	15874	16701	17518	18325	19123	19911	20690	21460	22221	22974
650	13992	14830	15656	16473	17280	18078	18866	19645	20415	21177	21930
660	12964	13801	14628	15444	16251	17049	17837	18616	19386	20148	20901
670	11950	12787	13614	14431	15238	16036	16824	17603	18373	19134	19887
680	10952	11789	12616	13433	14240	15037	15825	16604	17375	18136	18889
690	9968	10805	11632	12449	13256	14053	14842	15621	16391	17152	17905
700	8998	9836	10662	11479	12286	13084	13872	14651	15421	16183	16936
710	8043	8880	9707	10523	11330	12128	12916	13695	14465	15227	15980
720	7100	7937	8764	9581	10388	11185	11974	12753	13523	14284	15037
730	6171	7008	7835	8651	9458	10256	11044	11823	12593	13355	14108
740	5254	6091	6918	7734	8542	9339	10127	10906	11676	12438	13191
750	4349	5186	6013	6830	7637	8434	9223	10002	10772	11533	12286
760	3457	4294	5121	5937	6744	7542	8330	9109	9879	10641	11394
770	2576	3413	4240	5056	5864	6661	7449	8228	8998	9760	10513
780	1706	2543	3370	4187	4994	5791	6580	7359	8129	8890	9643
790	848	1685	2512	3328	4136	4933	5721	6500	7270	8032	8785
800	0	837	1664	2481	3288	4085	4874	5653	6423	7184	7937
810	109	0	827	1644	2451	3248	4036	4815	5586	6347	7100
820	218	109	0	817	1624	2421	3210	3989	4759	5520	6273
830	327	218	109	0	807	1605	2393	3172	3942	4703	5456
840	436	327	218	109	0	798	1586	2365	3135	3896	4649
850	546	437	328	219	109	0	788	1567	2337	3099	3852
860	655	547	438	328	219	110	0	779	1549	2311	3064
870	765	656	547	438	329	220	110	0	770	1532	2285
880	875	766	657	548	439	330	220	110	0	761	1514
890	985	877	768	659	549	440	330	220	110	0	753
900	1096	987	878	769	660	550	440	331	221	110	0
910	1206	1098	989	879	770	661	551	441	331	221	111
920	1317	1208	1099	990	881	771	662	552	442	332	221
930	1428	1319	1210	1101	992	882	773	663	553	443	332
940	1539	1430	1321	1212	1103	993	884	774	664	554	443
950	1650	1542	1433	1324	1214	1105	995	885	775	665	555
960	1762	1653	1544	1435	1326	1216	1107	997	887	776	666
970	1874	1765	1656	1547	1437	1328	1218	1108	998	888	778
980	1985	1877	1768	1659	1549	1440	1330	1220	1110	1000	890
990	2097	1989	1880	1771	1661	1552	1442	1332	1222	1112	1002
1000	2210	2101	1992	1883	1773	1664	1554	1444	1334	1224	1114
1010	2322	2213	2104	1995	1886	1776	1667	1557	1447	1337	1226
1020	2435	2326	2217	2108	1998	1889	1779	1669	1559	1449	1339
1030	2547	2439	2330	2221	2111	2002	1892	1782	1672	1562	1452
1040	2660	2552	2443	2334	2224	2115	2005	1895	1785	1675	1565
1050	2774	2665	2556	2447	2337	2228	2118	2008	1898	1788	1678
1060	2887	2778	2669	2560	2451	2341	2232	2122	2012	1902	1791
1070	3000	2892	2783	2674	2564	2455	2345	2235	2125	2015	1905
1080	3114	3005	2896	2787	2678	2569	2459	2349	2239	2129	2018
1090	3228	3119	3010	2901	2792	2682	2573	2463	2353	2243	2132
1100	3342	3233	3125	3015	2906	2797	2687	2577	2467	2357	2246

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	900	910	920	930	940	950	960	970	980	990	1000
710	15980	16724	17461	18189	18910	19623	20329	21027	21718	22402	23080
720	15037	15782	16518	17247	17968	18681	19386	20085	20776	21460	22137
730	14108	14852	15589	16317	17038	17751	18457	19155	19846	20530	21208
740	13191	13935	14672	15400	16121	16834	17540	18238	18929	19614	20291
750	12286	13031	13767	14496	15217	15930	16635	17334	18025	18709	19386
760	11394	12138	12875	13603	14324	15037	15743	16441	17132	17816	18494
770	10513	11257	11994	12722	13443	14156	14862	15560	16251	16936	17613
780	9643	10388	11124	11853	12574	13287	13992	14691	15382	16066	16743
790	8785	9529	10266	10994	11715	12428	13134	13832	14523	15208	15885
800	7937	8682	9418	10147	10868	11581	12286	12985	13676	14360	15037
810	7100	7845	8581	9310	10030	10744	11449	12147	12839	13523	14200
820	6273	7018	7754	8483	9204	9917	10622	11321	12012	12696	13373
830	5456	6201	6937	7666	8387	9100	9805	10504	11195	11879	12556
840	4649	5394	6130	6859	7580	8293	8998	9697	10388	11072	11749
850	3852	4596	5333	6061	6782	7495	8201	8899	9590	10275	10952
860	3064	3808	4545	5273	5994	6707	7413	8111	8802	9486	10164
870	2285	3029	3766	4494	5215	5928	6634	7332	8023	8707	9385
880	1514	2259	2996	3724	4445	5158	5864	6562	7253	7937	8614
890	753	1498	2234	2963	3683	4396	5102	5800	6492	7176	7853
900	0	745	1481	2210	2930	3643	4349	5047	5739	6423	7100
910	111	0	736	1465	2186	2899	3604	4303	4994	5678	6355
920	221	111	0	729	1449	2162	2868	3566	4257	4942	5619
930	332	222	111	0	721	1434	2139	2838	3529	4213	4890
940	443	333	222	111	0	713	1419	2117	2808	3492	4170
950	555	444	333	222	111	0	706	1404	2095	2779	3457
960	666	556	445	334	223	111	0	698	1389	2074	2751
970	778	667	556	446	334	223	112	0	691	1375	2053
980	890	779	668	557	446	335	224	112	0	684	1361
990	1002	891	780	669	558	447	336	224	112	0	677
1000	1114	1003	893	782	671	559	448	336	224	112	0
1010	1226	1116	1005	894	783	672	560	449	337	225	112
1020	1339	1228	1118	1007	896	784	673	561	449	337	225
1030	1452	1341	1230	1119	1008	897	786	674	562	450	338
1040	1565	1454	1343	1232	1121	1010	899	787	675	563	451
1050	1678	1567	1456	1346	1234	1123	1012	900	788	676	564
1060	1791	1681	1570	1459	1348	1237	1125	1013	902	789	677
1070	1905	1794	1683	1572	1461	1350	1239	1127	1015	903	791
1080	2018	1908	1797	1686	1575	1464	1352	1241	1129	1017	905
1090	2132	2022	1911	1800	1689	1578	1466	1355	1243	1131	1018
1100	2246	2136	2025	1914	1803	1692	1580	1469	1357	1245	1133
1110	2361	2250	2139	2029	1917	1806	1695	1583	1471	1359	1247
1120	2475	2365	2254	2143	2032	1921	1809	1698	1586	1474	1361
1130	2590	2479	2369	2258	2147	2035	1924	1812	1700	1588	1476
1140	2705	2594	2484	2373	2262	2150	2039	1927	1815	1703	1591
1150	2820	2709	2599	2488	2377	2265	2154	2042	1930	1818	1706
1160	2935	2825	2714	2603	2492	2381	2269	2158	2046	1934	1821
1170	3051	2940	2829	2719	2607	2496	2385	2273	2161	2049	1937
1180	3166	3056	2945	2834	2723	2612	2500	2389	2277	2165	2053
1190	3282	3172	3061	2950	2839	2728	2616	2505	2393	2281	2168
1200	3398	3288	3177	3066	2955	2844	2732	2621	2509	2397	2285

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
810	14200	14871	15535	16192	16843	17488	18127	18759	19386	20007	20623
820	13373	14044	14708	15365	16016	16661	17300	17933	18559	19181	19796
830	12556	13227	13891	14548	15199	15844	16483	17116	17743	18364	18979
840	11749	12420	13084	13741	14392	15037	15676	16309	16936	17557	18172
850	10952	11622	12286	12944	13595	14240	14878	15511	16138	16759	17375
860	10164	10834	11498	12156	12807	13452	14090	14723	15350	15971	16586
870	9385	10055	10719	11377	12028	12672	13311	13944	14571	15192	15807
880	8614	9285	9949	10606	11257	11902	12541	13174	13801	14422	15037
890	7853	8524	9187	9845	10496	11141	11780	12412	13039	13660	14276
900	7100	7771	8434	9092	9743	10388	11027	11659	12286	12907	13523
910	6355	7026	7690	8347	8998	9643	10282	10915	11542	12163	12778
920	5619	6289	6953	7611	8262	8907	9546	10178	10805	11426	12042
930	4890	5561	6225	6882	7533	8178	8817	9450	10077	10698	11313
940	4170	4840	5504	6162	6813	7458	8096	8729	9356	9977	10592
950	3457	4127	4791	5448	6100	6744	7383	8016	8643	9264	9879
960	2751	3421	4085	4743	5394	6039	6678	7310	7937	8558	9174
970	2053	2723	3387	4044	4696	5340	5979	6612	7239	7860	8475
980	1361	2032	2696	3353	4004	4649	5288	5921	6548	7169	7784
990	677	1348	2012	2669	3320	3965	4604	5237	5864	6485	7100
1000	0	671	1334	1992	2643	3288	3927	4559	5186	5807	6423
1010	112	0	664	1321	1972	2617	3256	3889	4516	5137	5752
1020	225	113	0	657	1309	1953	2592	3225	3852	4473	5088
1030	338	225	113	0	651	1296	1935	2567	3194	3815	4431
1040	451	338	226	113	0	645	1284	1916	2543	3164	3780
1050	564	452	339	226	113	0	639	1272	1898	2519	3135
1060	677	565	452	339	227	113	0	633	1260	1881	2496
1070	791	678	566	453	340	227	114	0	627	1248	1863
1080	905	792	680	567	454	341	227	114	0	621	1237
1090	1018	906	793	681	568	455	341	228	114	0	615
1100	1133	1020	908	795	682	569	455	342	228	114	0
1110	1247	1135	1022	909	796	683	570	456	342	228	114
1120	1361	1249	1136	1024	911	798	684	571	457	343	229
1130	1476	1364	1251	1138	1025	912	799	685	572	458	344
1140	1591	1479	1366	1253	1140	1027	914	800	686	573	458
1150	1706	1594	1481	1368	1255	1142	1029	915	802	688	574
1160	1821	1709	1596	1484	1371	1257	1144	1031	917	803	689
1170	1937	1824	1712	1599	1486	1373	1260	1146	1032	918	804
1180	2053	1940	1828	1715	1602	1489	1375	1262	1148	1034	920
1190	2168	2056	1943	1831	1718	1605	1491	1378	1264	1150	1036
1200	2285	2172	2060	1947	1834	1721	1607	1494	1380	1266	1152
1210	2401	2288	2176	2063	1950	1837	1724	1610	1496	1382	1268
1220	2517	2405	2292	2180	2067	1953	1840	1727	1613	1499	1385
1230	2634	2522	2409	2296	2183	2070	1957	1843	1729	1616	1501
1240	2751	2639	2526	2413	2300	2187	2074	1960	1846	1732	1618
1250	2868	2756	2643	2530	2417	2304	2191	2077	1963	1850	1735
1260	2985	2873	2760	2648	2535	2421	2308	2194	2081	1967	1853
1270	3103	2990	2878	2765	2652	2539	2426	2312	2198	2084	1970
1280	3221	3108	2996	2883	2770	2657	2543	2430	2316	2202	2088
1290	3338	3226	3113	3001	2888	2775	2661	2548	2434	2320	2206
1300	3457	3344	3232	3119	3006	2893	2779	2666	2552	2438	2324

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
910	12778	13388	13992	14591	15185	15774	16357	16936	17509	18078	18642
920	12042	12652	13256	13855	14449	15037	15621	16199	16773	17341	17905
930	11313	11923	12527	13126	13720	14309	14892	15471	16044	16613	17177
940	10592	11202	11807	12406	12999	13588	14171	14750	15323	15892	16456
950	9879	10489	11094	11693	12286	12875	13458	14037	14610	15179	15743
960	9174	9784	10388	10987	11581	12169	12753	13331	13905	14473	15037
970	8475	9085	9690	10289	10882	11471	12054	12633	13206	13775	14339
980	7784	8394	8998	9597	10191	10780	11363	11942	12515	13084	13648
990	7100	7710	8314	8913	9507	10096	10679	11257	11831	12400	12964
1000	6423	7033	7637	8236	8830	9418	10002	10580	11154	11722	12286
1010	5752	6362	6966	7565	8159	8748	9331	9910	10483	11052	11616
1020	5088	5698	6303	6902	7495	8084	8667	9246	9819	10388	10952
1030	4431	5041	5645	6244	6838	7426	8010	8588	9162	9730	10294
1040	3780	4390	4994	5593	6187	6775	7359	7937	8511	9079	9643
1050	3135	3745	4349	4948	5542	6130	6714	7292	7866	8434	8998
1060	2496	3106	3710	4309	4903	5492	6075	6654	7227	7796	8360
1070	1863	2473	3078	3677	4270	4859	5442	6021	6594	7163	7727
1080	1237	1846	2451	3050	3643	4232	4815	5394	5967	6536	7100
1090	615	1225	1830	2429	3022	3611	4194	4773	5346	5915	6479
1100	0	610	1214	1813	2407	2996	3579	4157	4731	5300	5864
1110	114	0	604	1203	1797	2386	2969	3548	4121	4690	5254
1120	229	115	0	599	1193	1781	2365	2943	3517	4085	4649
1130	344	229	115	0	594	1182	1766	2344	2918	3486	4050
1140	458	344	230	115	0	589	1172	1750	2324	2893	3457
1150	574	459	345	230	115	0	583	1162	1735	2304	2868
1160	689	574	460	345	230	115	0	578	1152	1721	2285
1170	804	690	575	461	346	231	115	0	574	1142	1706
1180	920	806	691	576	462	346	231	116	0	569	1133
1190	1036	922	807	692	577	462	347	232	116	0	564
1200	1152	1038	923	808	694	578	463	348	232	116	0
1210	1268	1154	1039	925	810	695	579	464	348	232	116
1220	1385	1270	1156	1041	926	811	696	580	465	349	233
1230	1501	1387	1273	1158	1043	928	813	697	581	466	349
1240	1618	1504	1389	1275	1160	1045	930	814	698	582	466
1250	1735	1621	1507	1392	1277	1162	1047	931	815	700	583
1260	1853	1738	1624	1509	1394	1279	1164	1048	933	817	701
1270	1970	1856	1741	1627	1512	1397	1281	1166	1050	934	818
1280	2088	1974	1859	1744	1629	1514	1399	1284	1168	1052	936
1290	2206	2092	1977	1862	1747	1632	1517	1402	1286	1170	1054
1300	2324	2210	2095	1980	1866	1750	1635	1520	1404	1288	1172
1310	2442	2328	2213	2099	1984	1869	1753	1638	1522	1406	1290
1320	2561	2447	2332	2217	2102	1987	1872	1757	1641	1525	1409
1330	2680	2565	2451	2336	2221	2106	1991	1875	1760	1644	1528
1340	2799	2684	2570	2455	2340	2225	2110	1994	1879	1763	1647
1350	2918	2803	2689	2574	2459	2344	2229	2113	1998	1882	1766
1360	3037	2923	2808	2694	2579	2464	2348	2233	2117	2001	1885
1370	3157	3042	2928	2813	2698	2583	2468	2352	2237	2121	2005
1380	3276	3162	3048	2933	2818	2703	2588	2472	2356	2241	2124
1390	3396	3282	3168	3053	2938	2823	2708	2592	2476	2361	2245
1400	3517	3402	3288	3173	3058	2943	2828	2712	2597	2481	2365

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
1010	11616	12175	12730	13280	13825	14367	14904	15436	15965	16489	17010
1020	10952	11511	12066	12616	13161	13703	14240	14772	15301	15825	16346
1030	10294	10854	11408	11958	12504	13045	13582	14115	14643	15168	15688
1040	9643	10203	10757	11307	11853	12394	12931	13464	13992	14517	15037
1050	8998	9558	10112	10662	11208	11749	12286	12819	13348	13872	14392
1060	8360	8919	9474	10024	10569	11111	11648	12180	12709	13233	13754
1070	7727	8286	8841	9391	9937	10478	11015	11547	12076	12600	13121
1080	7100	7659	8214	8764	9310	9851	10388	10921	11449	11974	12494
1090	6479	7038	7593	8143	8689	9230	9767	10300	10828	11352	11873
1100	5864	6423	6977	7528	8073	8614	9151	9684	10213	10737	11257
1110	5254	5813	6368	6918	7463	8005	8542	9074	9603	10127	10648
1120	4649	5209	5763	6313	6859	7400	7937	8470	8998	9523	10043
1130	4050	4610	5164	5714	6260	6801	7338	7871	8399	8924	9444
1140	3457	4016	4570	5121	5666	6207	6744	7277	7806	8330	8850
1150	2868	3427	3982	4532	5078	5619	6156	6689	7217	7742	8262
1160	2285	2844	3398	3949	4494	5035	5572	6105	6634	7158	7678
1170	1706	2265	2820	3370	3916	4457	4994	5527	6055	6580	7100
1180	1133	1692	2246	2797	3342	3884	4420	4953	5482	6006	6527
1190	564	1123	1678	2228	2774	3315	3852	4385	4913	5437	5958
1200	0	559	1114	1664	2210	2751	3288	3821	4349	4874	5394
1210	116	0	555	1105	1650	2192	2729	3261	3790	4314	4835
1220	233	116	0	550	1096	1637	2174	2707	3235	3760	4280
1230	349	233	117	0	546	1087	1624	2157	2685	3210	3730
1240	466	350	234	117	0	541	1078	1611	2139	2664	3184
1250	583	467	351	234	117	0	537	1070	1598	2123	2643
1260	701	584	468	351	234	117	0	533	1061	1586	2106
1270	818	702	585	469	352	235	118	0	529	1053	1573
1280	936	820	703	586	470	353	235	118	0	524	1045
1290	1054	938	821	704	588	470	353	236	118	0	520
1300	1172	1056	939	823	706	589	471	354	236	118	0
1310	1290	1174	1058	941	824	707	590	472	354	236	118
1320	1409	1293	1176	1059	943	825	708	591	473	355	237
1330	1528	1411	1295	1178	1061	944	827	709	592	474	356
1340	1647	1530	1414	1297	1180	1063	946	828	711	593	475
1350	1766	1649	1533	1416	1299	1182	1065	947	830	712	594
1360	1885	1769	1652	1536	1419	1302	1184	1067	949	831	713
1370	2005	1888	1772	1655	1538	1421	1304	1186	1069	951	833
1380	2124	2008	1892	1775	1658	1541	1424	1306	1189	1071	952
1390	2245	2128	2012	1895	1778	1661	1544	1426	1309	1191	1073
1400	2365	2248	2132	2015	1898	1781	1664	1546	1429	1311	1193
1410	2485	2369	2252	2136	2019	1902	1784	1667	1549	1431	1313
1420	2606	2490	2373	2256	2139	2022	1905	1788	1670	1552	1434
1430	2727	2610	2494	2377	2260	2143	2026	1908	1791	1673	1555
1440	2848	2732	2615	2498	2381	2264	2147	2030	1912	1794	1676
1450	2969	2853	2736	2620	2503	2386	2268	2151	2033	1915	1797
1460	3091	2974	2858	2741	2624	2507	2390	2272	2155	2037	1919
1470	3212	3096	2980	2863	2746	2629	2512	2394	2276	2159	2040
1480	3334	3218	3102	2985	2868	2751	2634	2516	2398	2280	2162
1490	3457	3340	3224	3107	2990	2873	2756	2638	2521	2403	2285
1500	3579	3463	3346	3230	3113	2996	2878	2761	2643	2525	2407

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
1110	10648	11164	11676	12185	12690	13191	13688	14182	14672	15159	15642
1120	10043	10560	11072	11581	12085	12586	13084	13577	14068	14554	15037
1130	9444	9961	10473	10982	11486	11987	12485	12978	13469	13955	14438
1140	8850	9367	9879	10388	10893	11394	11891	12385	12875	13361	13844
1150	8262	8778	9291	9799	10304	10805	11303	11796	12286	12773	13256
1160	7678	8195	8707	9216	9721	10222	10719	11213	11703	12189	12672
1170	7100	7616	8129	8637	9142	9643	10141	10634	11124	11611	12094
1180	6527	7043	7555	8064	8569	9070	9567	10061	10551	11037	11521
1190	5958	6474	6987	7495	8000	8501	8998	9492	9982	10469	10952
1200	5394	5910	6423	6931	7436	7937	8434	8928	9418	9905	10388
1210	4835	5351	5864	6372	6877	7378	7875	8369	8859	9346	9829
1220	4280	4796	5309	5817	6322	6823	7321	7814	8304	8791	9274
1230	3730	4246	4759	5267	5772	6273	6771	7264	7754	8241	8724
1240	3184	3701	4213	4722	5226	5728	6225	6719	7209	7695	8178
1250	2643	3159	3672	4180	4685	5186	5684	6177	6667	7154	7637
1260	2106	2622	3135	3643	4148	4649	5147	5640	6130	6617	7100
1270	1573	2090	2602	3111	3616	4117	4614	5108	5598	6084	6567
1280	1045	1561	2074	2582	3087	3588	4085	4579	5069	5556	6039
1290	520	1037	1549	2058	2563	3064	3561	4055	4545	5031	5514
1300	0	516	1029	1537	2042	2543	3041	3534	4024	4511	4994
1310	118	0	512	1021	1526	2027	2524	3018	3508	3995	4478
1320	237	119	0	509	1013	1514	2012	2505	2996	3482	3965
1330	356	237	119	0	505	1006	1503	1997	2487	2973	3457
1340	475	356	238	119	0	501	998	1492	1982	2469	2952
1350	594	475	357	238	119	0	497	991	1481	1968	2451
1360	713	595	476	357	239	119	0	494	984	1470	1953
1370	833	714	596	477	358	239	120	0	490	977	1460
1380	952	834	716	597	478	359	239	120	0	487	970
1390	1073	954	836	717	598	479	359	240	120	0	483
1400	1193	1074	956	837	718	599	480	360	240	120	0
1410	1313	1195	1076	958	839	719	600	480	361	241	120
1420	1434	1316	1197	1078	959	840	721	601	481	361	241
1430	1555	1436	1318	1199	1080	961	842	722	602	482	362
1440	1676	1557	1439	1320	1201	1082	963	843	723	603	483
1450	1797	1679	1560	1442	1323	1203	1084	964	845	725	604
1460	1919	1800	1682	1563	1444	1325	1206	1086	966	846	726
1470	2040	1922	1804	1685	1566	1447	1327	1208	1088	968	848
1480	2162	2044	1926	1807	1688	1569	1449	1330	1210	1090	970
1490	2285	2166	2048	1929	1810	1691	1571	1452	1332	1212	1092
1500	2407	2289	2170	2051	1932	1813	1694	1574	1454	1334	1214
1510	2530	2411	2293	2174	2055	1936	1816	1697	1577	1457	1337
1520	2652	2534	2416	2297	2178	2059	1939	1820	1700	1580	1460
1530	2776	2657	2539	2420	2301	2182	2062	1943	1823	1703	1583
1540	2899	2781	2662	2543	2424	2305	2186	2066	1946	1826	1706
1550	3022	2904	2786	2667	2548	2429	2309	2190	2070	1950	1830
1560	3146	3028	2909	2791	2672	2552	2433	2313	2194	2074	1953
1570	3270	3152	3033	2915	2796	2676	2557	2437	2318	2198	2077
1580	3394	3276	3157	3039	2920	2801	2681	2562	2442	2322	2202
1590	3519	3400	3282	3163	3044	2925	2806	2686	2566	2446	2326
1600	3643	3525	3407	3288	3169	3050	2930	2811	2691	2571	2451

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
1210	9829	10308	10785	11257	11727	12193	12657	13117	13573	14027	14478
1220	9274	9754	10230	10703	11172	11639	12102	12562	13019	13473	13923
1230	8724	9204	9680	10153	10622	11089	11552	12012	12469	12922	13373
1240	8178	8658	9134	9607	10077	10543	11006	11466	11923	12377	12828
1250	7637	8117	8593	9066	9535	10002	10465	10925	11382	11836	12286
1260	7100	7580	8056	8529	8998	9465	9928	10388	10845	11299	11749
1270	6567	7047	7523	7996	8466	8932	9395	9855	10312	10766	11217
1280	6039	6518	6995	7468	7937	8404	8867	9327	9784	10237	10688
1290	5514	5994	6470	6943	7413	7879	8342	8802	9259	9713	10164
1300	4994	5474	5950	6423	6892	7359	7822	8282	8739	9193	9643
1310	4478	4957	5433	5906	6376	6842	7305	7765	8222	8676	9127
1320	3965	4445	4921	5394	5864	6330	6793	7253	7710	8164	8614
1330	3457	3936	4412	4885	5355	5821	6284	6744	7201	7655	8106
1340	2952	3431	3908	4381	4850	5317	5780	6240	6697	7150	7601
1350	2451	2930	3407	3880	4349	4815	5279	5739	6195	6649	7100
1360	1953	2433	2909	3382	3852	4318	4781	5241	5698	6152	6603
1370	1460	1939	2416	2888	3358	3824	4288	4748	5204	5658	6109
1380	970	1449	1926	2398	2868	3334	3798	4257	4714	5168	5619
1390	483	963	1439	1912	2381	2848	3311	3771	4228	4682	5132
1400	0	480	956	1429	1898	2365	2828	3288	3745	4199	4649
1410	120	0	476	949	1419	1885	2348	2808	3265	3719	4170
1420	241	121	0	473	943	1409	1872	2332	2789	3243	3693
1430	362	242	121	0	470	936	1399	1859	2316	2770	3221
1440	483	363	242	121	0	466	930	1389	1846	2300	2751
1450	604	484	363	242	121	0	463	923	1380	1834	2285
1460	726	605	485	364	243	122	0	460	917	1371	1821
1470	848	727	607	486	365	243	122	0	457	911	1361
1480	970	849	729	608	487	365	244	122	0	454	905
1490	1092	971	851	730	609	487	366	244	122	0	451
1500	1214	1094	973	852	731	610	488	367	245	122	0
1510	1337	1216	1096	975	854	732	611	489	367	245	123
1520	1460	1339	1219	1098	977	855	734	612	490	368	245
1530	1583	1462	1342	1221	1100	978	857	735	613	491	369
1540	1706	1586	1465	1344	1223	1102	980	858	736	614	492
1550	1830	1709	1589	1468	1347	1225	1104	982	860	738	615
1560	1953	1833	1712	1591	1470	1349	1228	1106	984	862	739
1570	2077	1957	1836	1715	1594	1473	1351	1230	1108	986	863
1580	2202	2081	1961	1840	1719	1597	1476	1354	1232	1110	987
1590	2326	2206	2085	1964	1843	1722	1600	1478	1356	1234	1112
1600	2451	2330	2210	2089	1968	1846	1725	1603	1481	1359	1237
1610	2576	2455	2335	2214	2093	1971	1850	1728	1606	1484	1361
1620	2701	2580	2460	2339	2218	2096	1975	1853	1731	1609	1487
1630	2826	2706	2585	2464	2343	2222	2100	1979	1857	1734	1612
1640	2952	2831	2711	2590	2469	2347	2226	2104	1982	1860	1738
1650	3078	2957	2837	2716	2595	2473	2352	2230	2108	1986	1863
1660	3204	3083	2963	2842	2721	2599	2478	2356	2234	2112	1989
1670	3330	3210	3089	2968	2847	2726	2604	2482	2360	2238	2116
1680	3457	3336	3215	3095	2973	2852	2731	2609	2487	2365	2242
1690	3583	3463	3342	3221	3100	2979	2857	2736	2614	2492	2369
1700	3710	3590	3469	3348	3227	3106	2984	2863	2741	2619	2496

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
1310	9127	9575	10019	10461	10900	11337	11770	12200	12628	13054	13476
1320	8614	9062	9507	9949	10388	10824	11257	11688	12116	12541	12964
1330	8106	8554	8998	9440	9879	10315	10749	11179	11607	12032	12455
1340	7601	8049	8494	8936	9375	9811	10244	10675	11103	11528	11950
1350	7100	7548	7993	8434	8874	9310	9743	10174	10601	11027	11449
1360	6603	7050	7495	7937	8376	8812	9246	9676	10104	10529	10952
1370	6109	6557	7002	7443	7882	8319	8752	9183	9610	10036	10458
1380	5619	6067	6511	6953	7392	7829	8262	8693	9120	9546	9968
1390	5132	5580	6025	6467	6906	7342	7775	8206	8634	9059	9481
1400	4649	5097	5542	5984	6423	6859	7292	7723	8151	8576	8998
1410	4170	4617	5062	5504	5943	6379	6813	7243	7671	8096	8519
1420	3693	4141	4586	5028	5467	5903	6336	6767	7195	7620	8043
1430	3221	3668	4113	4555	4994	5430	5864	6294	6722	7147	7570
1440	2751	3199	3643	4085	4524	4961	5394	5825	6252	6678	7100
1450	2285	2732	3177	3619	4058	4494	4928	5358	5786	6211	6634
1460	1821	2269	2714	3156	3595	4031	4464	4895	5323	5748	6171
1470	1361	1809	2254	2696	3135	3571	4004	4435	4863	5288	5711
1480	905	1352	1797	2239	2678	3114	3548	3978	4406	4831	5254
1490	451	899	1343	1785	2224	2660	3094	3524	3952	4377	4800
1500	0	448	893	1334	1773	2210	2643	3074	3501	3927	4349
1510	123	0	445	887	1326	1762	2195	2626	3054	3479	3901
1520	245	123	0	442	881	1317	1750	2181	2609	3034	3457
1530	369	246	123	0	439	875	1309	1739	2167	2592	3015
1540	492	369	246	123	0	436	870	1300	1728	2153	2576
1550	615	493	370	247	124	0	433	864	1292	1717	2139
1560	739	617	494	371	247	124	0	431	858	1284	1706
1570	863	741	618	495	371	248	124	0	428	853	1276
1580	987	865	742	619	496	372	248	124	0	425	848
1590	1112	989	866	743	620	496	373	249	124	0	422
1600	1237	1114	991	868	745	621	497	373	249	125	0
1610	1361	1239	1116	993	870	746	622	498	374	250	125
1620	1487	1364	1241	1118	995	871	747	623	499	375	250
1630	1612	1489	1366	1243	1120	997	873	749	625	500	375
1640	1738	1615	1492	1369	1246	1122	998	874	750	626	501
1650	1863	1741	1618	1495	1371	1248	1124	1000	876	752	627
1660	1989	1867	1744	1621	1498	1374	1250	1126	1002	878	753
1670	2116	1993	1870	1747	1624	1500	1377	1253	1128	1004	879
1680	2242	2120	1997	1874	1750	1627	1503	1379	1255	1130	1006
1690	2369	2246	2124	2001	1877	1754	1630	1506	1382	1257	1133
1700	2496	2374	2251	2128	2004	1881	1757	1633	1509	1384	1260
1710	2623	2501	2378	2255	2132	2008	1884	1760	1636	1512	1387
1720	2751	2628	2505	2382	2259	2135	2012	1888	1764	1639	1514
1730	2879	2756	2633	2510	2387	2263	2139	2015	1891	1767	1642
1740	3007	2884	2761	2638	2515	2391	2267	2143	2019	1895	1770
1750	3135	3012	2889	2766	2643	2519	2396	2272	2148	2023	1898
1760	3263	3141	3018	2895	2771	2648	2524	2400	2276	2152	2027
1770	3392	3269	3147	3024	2900	2777	2653	2529	2405	2280	2156
1780	3521	3398	3276	3152	3029	2906	2782	2658	2534	2409	2285
1790	3650	3528	3405	3282	3158	3035	2911	2787	2663	2538	2414
1800	3780	3657	3534	3411	3288	3164	3041	2917	2792	2668	2543

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
1410	8519	8939	9356	9771	10183	10592	11000	11404	11807	12207	12604
1420	8043	8462	8880	9294	9707	10116	10523	10928	11330	11730	12128
1430	7570	7990	8407	8821	9234	9643	10050	10455	10858	11257	11655
1440	7100	7520	7937	8352	8764	9174	9581	9986	10388	10788	11185
1450	6634	7054	7471	7886	8298	8707	9114	9519	9922	10321	10719
1460	6171	6590	7008	7422	7835	8244	8651	9056	9458	9858	10256
1470	5711	6130	6548	6962	7375	7784	8191	8596	8998	9398	9796
1480	5254	5674	6091	6505	6918	7327	7734	8139	8542	8941	9339
1490	4800	5220	5637	6052	6464	6874	7281	7685	8088	8488	8885
1500	4349	4769	5186	5601	6013	6423	6830	7235	7637	8037	8434
1510	3901	4321	4738	5153	5565	5975	6382	6787	7189	7589	7987
1520	3457	3876	4294	4708	5121	5530	5937	6342	6744	7144	7542
1530	3015	3435	3852	4266	4679	5088	5495	5900	6303	6702	7100
1540	2576	2996	3413	3827	4240	4649	5056	5461	5864	6263	6661
1550	2139	2559	2977	3391	3803	4213	4620	5025	5427	5827	6225
1560	1706	2126	2543	2958	3370	3780	4187	4592	4994	5394	5791
1570	1276	1695	2113	2527	2940	3349	3756	4161	4563	4963	5361
1580	848	1268	1685	2099	2512	2921	3328	3733	4136	4535	4933
1590	422	842	1260	1674	2086	2496	2903	3308	3710	4110	4508
1600	0	420	837	1252	1664	2074	2481	2886	3288	3688	4085
1610	125	0	417	832	1244	1654	2061	2466	2868	3268	3666
1620	250	125	0	415	827	1237	1644	2048	2451	2851	3248
1630	375	251	125	0	412	822	1229	1634	2036	2436	2834
1640	501	376	251	126	0	410	817	1222	1624	2024	2421
1650	627	502	377	251	126	0	407	812	1214	1614	2012
1660	753	628	503	378	252	126	0	405	807	1207	1605
1670	879	754	629	504	378	252	126	0	402	802	1200
1680	1006	881	756	630	505	379	253	127	0	400	798
1690	1133	1008	883	757	632	506	380	253	127	0	398
1700	1260	1135	1010	884	759	633	507	380	254	127	0
1710	1387	1262	1137	1011	886	760	634	508	381	254	127
1720	1514	1389	1264	1139	1013	888	761	635	509	382	255
1730	1642	1517	1392	1267	1141	1015	889	763	636	510	383
1740	1770	1645	1520	1395	1269	1143	1017	891	764	638	511
1750	1898	1773	1648	1523	1397	1272	1145	1019	893	766	639
1760	2027	1902	1777	1651	1526	1400	1274	1148	1021	894	767
1770	2156	2031	1906	1780	1655	1529	1403	1276	1150	1023	896
1780	2285	2160	2035	1909	1784	1658	1532	1405	1279	1152	1025
1790	2414	2289	2164	2038	1913	1787	1661	1535	1408	1281	1154
1800	2543	2418	2293	2168	2042	1916	1790	1664	1537	1411	1284
1810	2673	2548	2423	2298	2172	2046	1920	1794	1667	1540	1413
1820	2803	2678	2553	2428	2302	2176	2050	1924	1797	1670	1543
1830	2933	2808	2683	2558	2432	2306	2180	2054	1927	1801	1674
1840	3064	2939	2814	2688	2563	2437	2311	2184	2058	1931	1804
1850	3194	3069	2944	2819	2693	2567	2441	2315	2189	2062	1935
1860	3325	3200	3075	2950	2824	2698	2572	2446	2320	2193	2066
1870	3457	3332	3207	3081	2956	2830	2704	2577	2451	2324	2197
1880	3588	3463	3338	3213	3087	2961	2835	2709	2582	2455	2328
1890	3720	3595	3470	3344	3219	3093	2967	2841	2714	2587	2460
1900	3852	3727	3602	3476	3351	3225	3099	2973	2846	2719	2592

DESIRED BORON CONCENTRATION (ppmB)

UNIT 1

OP/1/A/6100/22

Enclosure 4.3

Section 5.1

Caution: *If in Mode 3, 4 or 5, a correction factor, K, from Table 5.2 must be applied*

PRESENT BORON CONCENTRATION (ppmB)

	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700
1700	0	3852	7495	10952	14240	17375	20370	23238	25989	28632	31175
1725	319	2868	6511	9968	13256	16391	19386	22254	25005	27648	30191
1750	639	1898	5542	8998	12286	15421	18417	21285	24036	26679	29222
1775	960	943	4586	8043	11330	14465	17461	20329	23080	25723	28266
1800	1284	0	3643	7100	10388	13523	16518	19386	22137	24780	27323
1825	1608	325	2714	6171	9458	12593	15589	18457	21208	23851	26394
1850	1935	651	1797	5254	8542	11676	14672	17540	20291	22934	25477
1875	2263	979	893	4349	7637	10772	13767	16635	19386	22029	24573
1900	2592	1309	0	3457	6744	9879	12875	15743	18494	21137	23680
1925	2923	1640	331	2576	5864	8998	11994	14862	17613	20256	22799
1950	3256	1972	664	1706	4994	8129	11124	13992	16743	19386	21930
1975	3591	2307	998	848	4136	7270	10266	13134	15885	18528	21071
2000	3927	2643	1334	0	3288	6423	9418	12286	15037	17680	20223
2025	4264	2981	1672	338	2451	5586	8581	11449	14200	16843	19386
2050	4604	3320	2012	677	1624	4759	7754	10622	13373	16016	18559
2075	4945	3661	2353	1018	807	3942	6937	9805	12556	15199	17743
2100	5288	4004	2696	1361	0	3135	6130	8998	11749	14392	16936
2125	5633	4349	3041	1706	345	2337	5333	8201	10952	13595	16138
2150	5979	4696	3387	2053	691	1549	4545	7413	10164	12807	15350
2175	6327	5044	3735	2401	1039	770	3766	6634	9385	12028	14571
2200	6678	5394	4085	2751	1389	0	2996	5864	8614	11257	13801
2225	7029	5746	4437	3103	1741	352	2234	5102	7853	10496	13039
2250	7383	6100	4791	3457	2095	706	1481	4349	7100	9743	12286
2275	7739	6455	5147	3812	2451	1061	736	3604	6355	8998	11542
2300	8096	6813	5504	4170	2808	1419	0	2868	5619	8262	10805
2325	8456	7172	5864	4529	3168	1778	359	2139	4890	7533	10077
2350	8817	7533	6225	4890	3529	2139	721	1419	4170	6813	9356
2375	9180	7897	6588	5254	3892	2503	1084	706	3457	6100	8643
2400	9546	8262	6953	5619	4257	2868	1449	0	2751	5394	7937
2425	9913	8629	7321	5986	4625	3235	1816	367	2053	4696	7239
2450	10282	8998	7690	6355	4994	3604	2186	736	1361	4004	6548
2475	10653	9370	8061	6727	5365	3976	2557	1108	677	3320	5864
2500	11027	9743	8434	7100	5739	4349	2930	1481	0	2643	5186
2525	11402	10118	8810	7475	6114	4725	3306	1857	375	1972	4516
2550	11780	10496	9187	7853	6492	5102	3683	2234	753	1309	3852
2575	12159	10876	9567	8233	6871	5482	4063	2614	1133	651	3194
2600	12541	11257	9949	8614	7253	5864	4445	2996	1514	0	2543
2625	12925	11641	10333	8998	7637	6248	4829	3379	1898	384	1898
2650	13311	12028	10719	9385	8023	6634	5215	3766	2285	770	1260
2675	13700	12416	11107	9773	8412	7022	5603	4154	2673	1159	627
2700	14090	12807	11498	10164	8802	7413	5994	4545	3064	1549	0

DESIRED BORON CONCENTRATION (ppmB)

JPM A1b SRO

Facility: McGuire Task No.: 301OMP015
 Task Title: Approve a Completed Procedure JPM No.: 2008 Admin - JPM A1b
SRO

K/A Reference: GK/A 2.1.20 (4.6)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: Unit 1 is at 100% Power.
 PT/1/A/4600/003D, Monthly Surveillance Items, Enclosure 13.3, NC
 Pump Seal Injection Flow Checklist has been performed.

Task Standard: The operator will review completed Enclosure 13.3 of PT/1/A/4600/003D and identify errors as listed in the JPM. All critical tasks evaluated as satisfactory.

Required Materials: Calculator

General References: PT/1/A/4600/003D, Monthly Surveillance Items
 SOMP 04-02, Procedure Use and Adherence
 Tech Specs and Tech Spec Reference Manual

- Handouts: PT/1/A/4600/003D (Entire Procedure), with Enclosure 13.3, "NC Pumps Seal Injection Flow Checklist," marked up as follows:
- Cover Sheet – under date performed enter "5/12/08."
 - Cover Sheet – under Completion place a Check in the YES Box for the 1st, 2nd and 5th Checkboxes, and place a Check in the NA Box for the 3rd and 4th Checkboxes.
 - Cover Sheet – Under Completion place the name "Fred Kirk" under "Verified By" and enter the date verified as 5/12/08.
 - Cover Sheet – in remarks section, place performer's initials, but no name (**Known Error**). Also, place the initials and names of the operators who perform steps 1.8.1 and 1.8.3.
 - Step 1.1 Checkbox is checked.
 - Step 1.2 all 3 Checkboxes are checked.
 - Step 1.3 all 7 Checkboxes checked, and the following recorded:
 - 1NV-238 - _62_%
 - 1NV-241 - _46_%
 - 1NV-459 - _42_%
 - 1NV-458A – closed
 - 1NV-457A – closed
 - Pzr Level Master Position - _43_%
 - Pzr Level – 55%
 - Note prior to Step 1.4 is checked.
 - Step 1.4 – NA/Initialed.
 - Caution prior to Step 1.5 is checked.
 - Step 1.5.1 – NA/NO Initials (**Known Error**).
 - Steps 1.5.1.1 through 1.5.1.3 – leave blank (Higher Order step is NA).
 - Step 1.5.2 – 1st bullet has Checkmark placed in initial space (**Known Error**), other three bullets are initialed.
 - Notes prior to Step 1.5.3 are checked (3).
 - Step 1.5.3 – initialed, and the following recorded:
 - A – 12.4
 - B – 8.6
 - C – 8.0
 - D – 9.0
 - Total – 38 gpm
 - Note prior to Step 1.5.4 is checked.
 - Step 1.5.4 - NA/Initialed.
 - Steps 1.5.4.1 through 1.5.1.3 – leave blank (Higher Order step is NA).

- Note prior to Step 1.5.5 is checked.
- Steps 1.5.5 through 1.5.5.3 - Initialed.
- Step 1.6 both Checkboxes are checked.
- Step 1.7 - NA/Initialed.
- Steps 1.7.1 through 1.7.10– leave blank (Higher Order step is NA).
- Step 1.8 Initialed.
- Step 1.8.1 Initialed by SRO.
- Step 1.8.2 Checkbox is checked.
- Notes prior to Step 1.8.3 are checked (3).
- Step 1.8.3 all four bullets initialed, DV space initialed and initials of procedure performer are listed beside each bullet.
- Step 1.8.4 – initialed, and the following recorded:
 - A – 9.8
 - B – 10.6
 - C – 10.2
 - D – 9.8
 - Total – 39.4 gpm (**Known Error** (Math Error))
- Step 1.8.5 both Checkboxes are checked.
- Step 1.8.6 is left blank (**Known Error**).
- Step 1.8.6.1 Checkbox is checked.
- Step 1.8.6.2 – Initialed.
- Steps 1.8.6.3 - NA/Initialed.
- Steps 1.8.6.4 through all four bullets of Step 1.8.6.5 – initialed.
- Steps 1.8.6.6 – NA/Initialed.
- Steps 1.8.6.6 A and B – leave blank (Higher Order step is NA).
- Note prior to Step 1.8.6.7 is checked.
- Steps 1.8.6.7 - NA/Initialed.
- Steps 1.8.6.7 A-C – leave blank (Higher Order step is NA).
- Note prior to Step 1.8.6.8 is checked.
- Steps 1.8.6.8, A-C through 1.8.6.9 – initialed.
- Step 1.8.6.10 Checkbox is checked.
- Step 1.9.1 – Initialed (**Known Error** – Should have been left blank)
- Step 1.9.2 – Left Blank (**Known Error** – Operator’s Review will determine that it must be completed).
- Step 1.9.2.1 and 1.9.2.2 Checkboxes are left blank (**Known Error** - Operators Review will determine that it must be completed)

SOMP 04-02, Procedure Use and Adherence
Tech Specs and Tech Spec Reference Manual

Initiating Cue: Evaluate the procedure for technical and administrative accuracy in accordance with Section 10 of SOMP 04-02, "Procedure Use and Adherence."

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and handout marked up copy of PT/1/A/4600/003D, Enclosure 13.3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(SOMP 04-02/Step 10.1) Review the procedure.</p> <p>(Step 10.1.1) A supervisor shall perform a timely review of the procedure and verify completeness.</p>	<p>Operator reviews the procedure and discovers the following administrative errors:</p> <p>NOTE TO EXAMINER: Three (3) of the Four (4) minor errors must be identified by operator.</p> <ul style="list-style-type: none"> • No name is provided for initials on Procedure Cover Sheet. • Step 1.5.1 has NOT been initialed as required. • Step 1.5.2 has a checkmark instead of initials. • Step 1.8.6 is left blank. <p>Cue:</p> <p>If it is apparent that the operator is seeking to use OMP 04-02, provide a copy to the operator.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<p>(SOMP 04-02/Step 10.1) Review the procedure.</p> <p>(Step 10.1.1) A supervisor shall perform a timely review of the procedure and verify completeness.</p>	<p>Step 1.8.3 – Operator recognizes that the performer did NOT comply with step 1.8.3 and establish 7.8-8.8 gpm of Seal Water Flow to each NC Pump.</p> <p>* Step 1.8.4 – A math error exists (should be 40.4 instead of 39.4 gpm). Because of this, the Acceptance Criteria is NOT met, even though the individual performing the PT has indicated that it has been met in step 1.9.1.</p> <p>* The operator recognizes this and corrects the math error, entering 40.4 gpm on step 1.8.4, and lining out and initialing step 1.9.1 indicating Acceptance Criteria is NOT met.</p> <p>Operator proceeds to Step 1.9.2.</p>		
*				
*				

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(PT/1/A/4600/003D/ Enclosure 13.3/Step 1.9.2) If any acceptance criteria is NOT met, perform the following: (Step 1.9.2.1) Item is identified as a discrepancy, evaluated per Tech Spec/SLC and appropriate Action is taken.	Operator addresses Technical Specification 3.5.5 and determines that the LCO is NOT met. Operator identifies that Condition A is applicable, and that Action A.1 is required within 4 hours. Cue: If it is apparent that the operator is seeking to use Technical Specifications and the Tech Spec Reference Manual, provide a copy to the operator.		
4	(Step 1.9.2.2) Discrepancy Sheet is attached.	Cue: Another SRO will complete the discrepancy sheet and turn in the procedure.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A1b SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS: Unit 1 is at 100% Power.
PT/1/A/4600/003D, Monthly Surveillance Items, Enclosure 13.3,
NC Pump Seal Injection Flow Checklist has been performed.

INITIATING CUE: Evaluate the procedure for technical and administrative accuracy
in accordance with Section 10 of SOMP 04-02, "Procedure Use
and Adherence."

Duke Energy
 McGuire Nuclear Station
Monthly Surveillance Items

Procedure No.
PT/1/A/4600/003 D

Revision No.
069

Electronic Reference No.
MC00483G

Continuous Use

PERFORMANCE

This Procedure was printed on 04/29/08 at 07:59:27 from the electronic library as:

(ISSUED) - PDF Format

Compare with Control Copy every 14 calendar days while work is being performed.

Compared with Control Copy RD Billings Date 5-12-08

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Date(s) Performed 5-12-08

Work Order/Task Number (WO#)
N/A

COMPLETION

- Yes NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- Yes NA Required enclosures attached?
- Yes NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
- Yes NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
- Yes NA Procedure requirements met?

Verified By Fred Kirk Date 5-12-08

Procedure Completion Approved _____ Date _____

Remarks (attach additional pages, if necessary)

AK - Fred Kirk PERFORMED ENC 13 3 ONLY
ROB
BS - Bill Smith
DC - Dan Clark

IMPORTANT:
 Do **NOT** mark
 on barcodes.

Procedure No.
 PT/1/A/4600/003 D

Revision No.
 069

Enclosure Number
 FULL

Printed Date
 04/29/2008

Revision History (significant issues, limited to one page)

- Rev 069 (12-2-07)
Removed Restricted change to Enclosure 13.5 that changed the positions for 1CA-86A and 1CA-116B from "CLOSED" to "OPEN". Both valves are now "CLOSED".
- Rev 068 (11-28-07)
Restricted change to Enclosure 13.5, changed the positions for 1CA-86A and 1CA-116B from "CLOSED" to "OPEN". {PIP 07-6071}
- Rev 067 (11/15/07) Updated procedure to include sign offs for acceptance criteria being met or evaluations being made. {PIP M-07-00393}
- Rev 066 (09/13/07)
- Incorporated Reactivity Management guidelines into enclosure 13.3.
 - Per PIP 07-1787, in Enclosure 13.1, clarified that S/G NR Levels Channel 3 and 4 are required for compliance of ITS 3.3.3 (Post Accident Monitoring Instrumentation). Two channels are required operable and isolated from 7300 PCS. For S/G NR Level, Channels 1 and 2 are not isolated from 7300 PCS as described in UFSAR 1.11.5.1.3.1 and cannot be used for ITS 3.3.3.12 compliance.
 - Revised Step 4.1 to add sign off blanks for each pressurizer level channel.
 - Deleted old Step 2.1 of Enclosure 13.1. The instruments listed are not required to meet TS 3.3.3 (reference PIP M-00-00779).
 - Revised Enclosure 13.1. as follows:

Note: These changes are in response to PIP M-07-01914. Docu Track MNS-2002-003259 can also be used as a reference. These changes were discussed with Phil Keller of Engineering and meet his recommendations.

- Deleted note prior to Step 1.12.
- Deleted Step 1.12.1.
- Added new Step 1.12.1. This step is applicable in Modes 1 - 3 and checks Wide Range Flux meter deviation. Guidance is also provided to notify Engineering to evaluate operability.
- Revised format of old Step 1.12.2 and changed deviation range from 15% to 20%.
- On page 3 of 6 added new Step to check operability of NC WR pressure and deleted old Step 3.1. The instruments referenced in Step 3.1 are not isolated and therefore can not be used for Tech Spec surveillance.

Monthly Surveillance Items

1. Purpose

- Check proper operation or condition of various instruments and systems.
- Check the positions of various valves in ECCS and NS flowpaths.

2. References

2.1 Tech Spec:

- ITS SR 3.3.3.1, ITS Table 3.3.3-1, Post Accident Monitoring Instrumentation
- ITS SR 3.3.4.1, Table 3.3.4-1, Remote Shutdown System
- ITS SR 3.5.5.1, Seal Injection Flow
- ITS SR 3.5.1.4, (Cold Leg) Accumulators
- ITS SR 3.7.5.1, CA
- ITS SR 3.5.2.2, ECCS Flow path
- ITS SR 3.6.6.1, NS Flow path
- ITS Table 3.3.1-1 Items 16.a-e, Reactor Trip System Instrumentation (P-6, P-7, P-8, P-10 and P-13)

2.2 UFSAR

2.3 TMI Response

3. Time Required

Two operators for 2 hours once per 31 days.

4. Prerequisite Tests

None

5. Equipment Required

- 5.1 Auxiliary Shutdown Control Panel Key #172
- 5.2 H₂ Analyzer Panel Keys #172 and #196

6. Limits and Precautions

- 6.1 This procedure is Reactivity Management related. Enclosure 13.3 (NC Pumps Seal Injection Flow Checklist) adjusts letdown flow to the NC System which can affect letdown temperature which affects boron saturation of NV demineralizers. (R.M.)
- 6.2 **IF** acceptance criteria **NOT** met, a report to the NRC may be necessary. Operations Shift Manager and NCO shall be notified immediately. Operations Staff Manager or Designee should be notified if deemed appropriate by Operations Shift Manager.
- 6.3 **IF** any instrument inoperable or out of Tech Spec requirements, consult appropriate Tech Spec Actions to determine any necessary immediate or corrective action.
- 6.4 **IF** Unit status or System condition prevents performance of a surveillance item, item should be noted.

7. Required Unit Status

RDB 7.1 Mode 1, 2, 3 or 4.

8. Prerequisite System Conditions

None

9. Test Method

- Visual inspection of various instruments
- Total NC Pump Seal Injection Flow is determined to be less than or equal to 40 gpm
- Most current boron concentration of CLAs determined to be greater than COLR limits
- Visual inspection of various pump motor indications
- Visual inspection of various valve position indications. Valves with power removed by R&Rs, procedure, or Tech Specs may have their position checked using OAC. **IF** power and OAC unavailable, visual indication of valve position shall be made

10. Data Required

- 10.1 Completed Enclosures 13.1 - 13.7.

11. Acceptance Criteria

- 11.1 Each valve or instrument operable or identified as a discrepancy, evaluated per Tech Spec / SLC and appropriate corrective action taken.
- 11.2 In Enclosure 13.3 (NC Pumps Seal Injection Flow Checklist), total amount of Controlled Leakage to NC Pump Seals is less than or equal to 40 gpm.
- 11.3 In Enclosure 13.4 (Boron Concentration Checklist), each Cold Leg Accumulator shall contain a boron concentration within the LCO limits specified in the COLR.
- 11.4 In Enclosure 13.5 (CA Valve/Power Supply Checklist), Enclosure 13.6 (ECCS and NS Valve/Power Supply Checklist for Modes 1 - 3) and Enclosure 13.7 (ECCS and NS Valve/Power Supply Checklist for Mode 4):
- 11.4.1 In Part A of each enclosure, one of the following criteria shall apply:
- 11.4.1.1 Correct valve position indication (unless otherwise noted)
- OR
- 11.4.1.2 Item identified as a discrepancy, evaluated per Tech Specs / SLC and appropriate corrective action taken.
- 11.4.2 In Part B of each enclosure, one of the following criteria shall apply:
- 11.4.2.1 Valve control power or pump motor control power is available
- OR
- 11.4.2.2 Item identified as a discrepancy, evaluated per Tech Specs / SLC and appropriate corrective action taken.

12. Procedure

12.1 Record Mode: 1

N/A ^{R013} 12.2 **IF** in Mode 1, 2, 3, **OR** prior to entering Mode 3, perform the following:
(Enclosures may be performed in any order.)

- Complete Enclosure 13.1 (Main Control Board Instrumentation Checklist)
- Complete Enclosure 13.2 (Remote Instrumentation Checklist)
- Complete Enclosure 13.6 (ECCS and NS Valve / Power Supply Checklist for Modes 1 - 3)

NOTE: ✓ Seal Injection valves may be set up per OP/1/A/6200/001 B (Chemical Volume and Control System Charging) in Modes 3 and 4. Leakage must be documented by performing Enclosure 13.3 (NC Pumps Seal Injection Flow Checklist) of this procedure prior to Mode 2 **OR** within 4 hours after NC System pressure stabilizes between 2215 - 2255 psig in Modes 1 - 3.

RDB 12.3 **IF** in Modes 1, 2, 3 **OR** within 4 hours after NC System pressure stabilizes between 2215 - 2255 psig, perform Enclosure 13.3 (NC Pumps Seal Injection Flow Checklist).

N/A RDB 12.4 **IF** in Modes 1, 2, 3 **AND** NC System Pressure is greater than 1000 psig, perform Enclosure 13.4 (Boron Concentration Checklist).

N/A RDB 12.5 **IF** in Modes 1, 2, 3 **OR** in Mode 4 with CA operable, perform Enclosure 13.5 (CA Valve Checklist).

N/A RDB 12.6 **IF** in Mode 4, perform Enclosure 13.7 ECCS and NS Valve/Power Supply Checklist for Mode 4

13. Enclosures

- 13.1 Main Control Board Instrumentation Checklist
- 13.2 Remote Instrumentation Checklist
- 13.3 NC Pumps Seal Injection Flow Checklist
- 13.4 Boron Concentration Checklist
- 13.5 CA Valve/Power Supply Checklist
- 13.6 ECCS and NS Valve/Power Supply Checklist for Modes 1 - 3
- 13.7 ECCS and NS Valve/Power Supply Checklist for Mode 4

End of Body

Unit 1

NC Pumps Seal Injection Flow Checklist

1. Procedure

1.1 **IF** in Mode 1 or 2, ensure Reactivity Management controls established per SOMP 01 - 02 (Reactivity Management). (R.M.)

1.2 Check the following:

- NC System pressure stable between 2215 – 2255 psig
- Pzr Level at program level
- Normal letdown in service

1.3 Record the following:

- | | |
|---|---------------|
| <input checked="" type="checkbox"/> INV-238 (Charging Line Flow Control) position | <u>62%</u> |
| <input checked="" type="checkbox"/> INV-241 (Seal Injection Flow Control) position | <u>46%</u> |
| <input checked="" type="checkbox"/> INV-459 (Variable L/D Orifice Outlet Flow Control) position | <u>42%</u> |
| <input checked="" type="checkbox"/> INV-458A (75 gpm L/D Orifice Outlet Cont Isol) position | <u>closed</u> |
| <input checked="" type="checkbox"/> INV-457A (45 gpm L/D Orifice Outlet Cont Isol) position | <u>closed</u> |
| <input checked="" type="checkbox"/> Pzr Level Master position | <u>43%</u> |
| <input checked="" type="checkbox"/> Pzr Level | <u>55%</u> |

NOTE: Maximum design flowrate through the Cation Bed Demin is 75 gpm.

N/A ⁰⁰³ 1.4 **IF** Cation Bed Demineralizer is in service, maintain flow per OP/1/A/6200/001 D (Chemical and Volume Control System Demineralizers) by throttling INV-345 (Mixed Bed Demin Outlet Hdr).

CAUTION: Adjusting Letdown flow or pressure may cause changes in Letdown Hx outlet temperature. Changing Letdown temperature affects Boron saturation of NV demineralizers which can result in Boron addition or dilution of NCS. (R.M.)

1.5 Establish 120 gpm charging flow as follows:

N/A 1.5.1 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) **OR** INV-458A (75 gpm L/D Orifice Outlet Cont Isol) open, perform the following:

- _____ 1.5.1.1 Ensure closed INV-459 (Variable L/D Orifice Outlet Flow Control).
- _____ 1.5.1.2 Open INV-35A (Variable L/D Orifice Outlet Cont Isol).
- _____ 1.5.1.3 Place INV-124 (Letdown Press Control) in "MAN" and reduce letdown pressure to 150–250 psig. (R.M.)

NC Pumps Seal Injection Flow Checklist

1.5.2 Perform the following steps concurrently:

- Place INV-238 (Charging Line Flow Control) in "MAN" and throttle open
- RDB • Throttle open INV-459 (Variable L/D Orifice Outlet Flow Control) to increase letdown flow to equal charging flow increase (R.M.)
- RDB • Throttle INV-241 (Seal Injection Flow Control) to increase charging flow to 120 gpm (115-125 gpm acceptable) and maintain seal injection flow
- RDB • Adjust INV-124 (Letdown Press Control) to maintain letdown pressure less than 500 psig (R.M.)

NOTE: • Normal operating band for total seal injection flow is 32 - 40 gpm.
 • Operating band of 7.8 - 8.8 gpm to each NC Pump preferred.
 • It is desirable to closely match all seal flows within 0.2 gpm.

RDB 1.5.3 **WHEN** INV-238 (Charging Line Flow Control) full open **AND** charging flow 120 gpm (115-125 gpm acceptable), record seal injection flow to each NC Pump, then sum for total flow:

$$\begin{array}{ccccccc}
 \underline{12.4} & + & \underline{8.6} & + & \underline{8.0} & + & \underline{9.0} & = & \underline{38} & \text{gpm} \\
 \text{A} & & \text{B} & & \text{C} & & \text{D} & & &
 \end{array}$$

NOTE: Letdown backpressure requirements when using INV-457A (45 gpm L/D Orifice Outlet Cont Isol) have been raised due to excessive vibration.

N/A RDB 1.5.4 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) open, perform the following:

- _____ 1.5.4.1 Adjust INV-124 (Letdown Press Control) to maintain 450 - 475 psig letdown. (R.M.)
- _____ 1.5.4.2 Ensure INV-124 (Letdown Press Control) potentiometer set to control pressure at 450 - 475 psig.
- _____ 1.5.4.3 Place INV-124 (Letdown Press Control) in "AUTO".

NC Pumps Seal Injection Flow Checklist

NOTE: ✓ Normal Letdown Pressure of 350 psig is preferred. A range is provided to allow flexibility due to abnormal plant conditions.

RDB 1.5.5 **IF** 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) closed, perform the following:

RDB 1.5.5.1 Adjust 1NV-124 (Letdown Press Control) potentiometer to maintain 150 - 375 psig letdown pressure. (R.M.)

RDB 1.5.5.2 Ensure 1NV-124 (Letdown Press Control) potentiometer set to actual letdown pressure.

RDB 1.5.5.3 Place 1NV-124 (Letdown Press Control) in "AUTO".

1.6 Maintain Pzr Level at program level by throttling:

1NV-241 (Seal Injection Flow Control)

1NV-459 (Variable L/D Orifice Outlet Flow Control)

N/A RDB 1.7 **IF** seal injection flow less than or equal to 40 gpm **AND** seal injection flow adjustment **NOT** desired, restore normal charging flow as follows:

1.7.1 Refer to values recorded in Step 1.3.

_____ 1.7.2 Place 1NV-124 (Letdown Pressure Control) in "MAN".

_____ 1.7.3 **IF** 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) open, adjust 1NV-124 (Letdown Press Control) to maintain 450-475 psig letdown pressure. (R.M.)

_____ 1.7.4 **IF** 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) closed, adjust 1NV-124 (Letdown Press Control) to maintain 150 - 375 psig letdown pressure. (R.M.)

1.7.5 Perform the following steps concurrently:

_____ • Throttle closed 1NV-238 (Charging Line Flow Control)

_____ • Throttle closed 1NV-459 (Variable L/D Orifice Outlet Flow Control) to decrease letdown flow to equal charging flow decrease (R.M.)

_____ • Adjust 1NV-241 (Seal Injection Flow Control) to obtain normal Seal Injection Flow to each NC Pump

_____ • Adjust 1NV-124 (Letdown Press Control) to maintain letdown pressure at desired pressure (R.M.)

NC Pumps Seal Injection Flow Checklist

- _____ 1.7.6 **IF** 1NV-459 (Variable L/D Orifice Outlet Flow Control) no longer required to maintain additional letdown flow, perform the following:
- _____ 1.7.6.1 Close 1NV-459 (Variable L/D Orifice Outlet Flow Control). (R.M.)
 - _____ 1.7.6.2 **WHEN** 1NV-459 (Variable L/D Orifice Outlet Flow Control) closed, close 1NV-35A (Variable L/D Orifice Outlet Cont Isol).

NOTE: Letdown backpressure requirements when using 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) have been raised due to excessive vibration.

- _____ 1.7.7 **IF** 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) open, perform the following:
- _____ 1.7.7.1 Adjust 1NV-124 (Letdown Press Control) to maintain 450 - 475 psig letdown. (R.M.)
 - _____ 1.7.7.2 Ensure 1NV-124 (Letdown Press Control) potentiometer set to control pressure at 450 - 475 psig.
 - _____ 1.7.7.3 Place 1NV-124 (Letdown Press Control) in "AUTO".

NOTE: Normal Letdown Pressure of 350 psig is preferred. A range is provided to allow flexibility due to abnormal plant conditions.

- _____ 1.7.8 **IF** 1NV-457A (45 gpm L/D Orifice Outlet Cont Isol) closed, perform the following:
- _____ 1.7.8.1 Adjust 1NV-124 (Letdown Press Control) potentiometer to maintain 150 - 375 psig letdown pressure. (R.M.)
 - _____ 1.7.8.2 Ensure 1NV-124 (Letdown Press Control) potentiometer set to actual letdown pressure.
 - _____ 1.7.8.3 Place 1NV-124 (Letdown Press Control) in "AUTO".
- _____ 1.7.9 **WHEN** Pzr Level at program level, place 1NV-238 (Charging Line Flow Control) in "AUTO".
- 1.7.10 Maintain Pzr Level at program level.

NC Pumps Seal Injection Flow Checklist

RDB 1.8 **IF** seal injection flow greater than 40 gpm **OR** adjustments to seal injection flow desired, complete the following:

JK
SRO 1.8.1 Evaluate ITS 3.5.5 (Seal Injection Flow).

1.8.2 Station operators at seal injection valves in contact with Control Room.

NOTE: ✓ Normal operating band for total seal injection flow is 32 - 40 gpm.
✓ Operating band of 7.8 - 8.8 gpm to each NC Pump preferred.
✓ It is desirable to closely match all seal flows within 0.2 gpm.

1.8.3 With INV-238 (Charging Line Flow Control) full open **AND** charging flow 120 gpm (115-125 gpm acceptable), adjust the following to establish 7.8 - 8.8 gpm to each NC Pump:

RDB BS DC • INV-28 (NC Pump 1A Seal Water Manual Control)

DV BS DC • INV-44 (NC Pump 1B Seal Water Manual Control)

DV BS DC • INV-60 (NC Pump 1C Seal Water Manual Control)

DV BS DC • INV-76 (NC Pump 1D Seal Water Manual Control)

1.8.4 Check total seal injection flow less than or equal to 40 gpm:

$$\frac{9.8}{A} + \frac{10.6}{B} + \frac{10.2}{C} + \frac{9.8}{D} = 39.4 \text{ gpm}$$

1.8.5 Maintain Pzr Level at program level by throttling:

- INV-241 (Seal Injection Flow Control)
- INV-459 (Variable L/D Orifice Outlet Flow Control)

NC Pumps Seal Injection Flow Checklist

_____ 1.8.6 **WHEN** seal injection flow less than or equal to 40 gpm, restore normal charging flow as follows:

1.8.6.1 Refer to values recorded in Step 1.3.

RDB 1.8.6.2 Place INV-124 (Letdown Pressure Control) in "MAN".

N/A ^{RDB} 1.8.6.3 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) open, adjust INV-124 (Letdown Press Control) to maintain 450-475 psig letdown pressure. (R.M.)

RDB 1.8.6.4 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) closed, adjust INV-124 (Letdown Press Control) to maintain 150 - 375 psig letdown pressure. (R.M.)

1.8.6.5 Perform the following steps concurrently:

RDB • Throttle closed INV-238 (Charging Line Flow Control)

RDB • Throttle closed INV-459 (Variable L/D Orifice Outlet Flow Control) to decrease letdown flow to equal charging flow decrease (R.M.)

RDB • Adjust INV-241 (Seal Injection Flow Control) to obtain normal Seal Injection Flow to each NC Pump

RDB • Adjust INV-124 (Letdown Press Control) to maintain letdown pressure at desired pressure (R.M.)

N/A ^{RDB} 1.8.6.6 **IF** INV-459 (Variable L/D Orifice Outlet Flow Control) no longer required to maintain additional letdown flow, perform the following:

_____ A. Close INV-459 (Variable L/D Orifice Outlet Flow Control). (R.M.)

_____ B. **WHEN** INV-459 (Variable L/D Orifice Outlet Flow Control) closed, close INV-35A (Variable L/D Orifice Outlet Cont Isol).

NOTE: ✓ Letdown backpressure requirements when using INV-457A (45 gpm L/D Orifice Outlet Cont Isol) have been raised due to excessive vibration.

NA RDB 1.8.6.7 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) open, perform the following:

- _____ A. Adjust INV-124 (Letdown Press Control) to maintain 450 - 475 psig letdown. (R.M.)
- _____ B. Ensure INV-124 (Letdown Press Control) potentiometer set to control pressure at 450 - 475 psig.
- _____ C. Place INV-124 (Letdown Press Control) in "AUTO".

NOTE: ✓ Normal Letdown Pressure of 350 psig is preferred. A range is provided to allow flexibility due to abnormal plant conditions.

RDB 1.8.6.8 **IF** INV-457A (45 gpm L/D Orifice Outlet Cont Isol) closed, perform the following:

- RDB A. Adjust INV-124 (Letdown Press Control) potentiometer to maintain 150 - 375 psig letdown pressure. (R.M.)
- RDB B. Ensure INV-124 (Letdown Press Control) potentiometer set to actual letdown pressure.
- RDB C. Place INV-124 (Letdown Press Control) in "AUTO".

RDB 1.8.6.9 **WHEN** Pzr Level at program level, place INV-238 (Charging Line Flow Control) in "AUTO".

1.8.6.10 Maintain Pzr Level at program level.

1.9 Complete one of the following:

RDB 1.9.1 Acceptance criteria met.

OR

_____ 1.9.2 **IF** any acceptance criteria **NOT** met, perform the following:

SRO

- 1.9.2.1 Item is identified as a discrepancy, evaluated per Tech Spec/SLC and appropriate action is taken.
- 1.9.2.2 Discrepancy sheet is attached.

End of Enclosure

Unit 1



JPM A2 SRO

Facility: McGuire Task No.: 301OMP025

Task Title: Review Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump JPM No.: 2008 Admin - JPM A2 SRO

K/A Reference: GK/A 2.2.13 (4.3)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Unit 1 is at 100% power.
- A severe seal leak has just been discovered on 1B NI Pump.
- The WCC SRO has informed you that 1NI-149 has a history of seat leakage.
- A List of Suggested Tagged Components has been prepared to Isolate 1B NI Pump.

Task Standard: Verify the Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump. Component, positions and sequence are identified accurately.

Required Materials: None

General References: SOMP 02-01, Safety Tagging and Configuration Control
NSD 500, Red Tags/Configuration Control Tags
McGuire Flow Diagram, Drawing #MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI)

Handouts: List of Suggested Tagged Components for 1B NI Pump (w/errors).

McGuire Flow Diagram, Drawing #MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI)

Initiating Cue: The Work Control Center Supervisor has directed you to verify the Mechanical and Electrical Isolation Boundaries needed to isolate the 1B NI Pump for pump repair. Make any corrections if needed.

Time Critical Task: NO

Validation Time: 20 minutes

Examiner NOTES: See KEY for Tagout on Pages 7-8 of this JPM.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue, the List of Suggested Tagged Components for 1B NI Pump (Last Two Pages of this JPM), and Drawing #MCFD-1562-03.00.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1 (See Key for CT*)	Operator reviews MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI) and determines components required to be tagged.	Operator reviews MCFD-1562-03.00, Flow Diagram of Safety Injection System (NI) and determines that the following components are required to be tagged: <ul style="list-style-type: none"> • 1B NI Pump Motor DC Fuse Block • 1B NI Pump Motor Bkr • 1NI - 144B • 1NI - 152B • 1NI - 150B • 1NI - 136B • 1NI - 135B • 1NI - 144B Bkr • 1NI - 152B Bkr • 1NI - 150B Bkr • 1NI - 136B Bkr • 1NI - 135B Bkr • 1NI - 141 (Drain) • 1NI - 142 (Drain) • 1NI - 140 (Drain) • 1NI - 137 (Vent) • 1NI - 402 (Vent) • 1NI-139 (Drain) • 1NI-210 (Vent) • 1NI-858 (Optional) 		
*2	Operator determines position of components required to be tagged.	Per KEY		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	Operator determines sequence in which the components are required to be tagged.	Per KEY		
4	<p>Verify adequacy of Mechanical and Electrical Isolation Boundaries to Isolate 1B NI Pump.</p> <p>Per Admin procedure SOMP 02-01 the Discharge Valve "Should" be closed before the Suction Valve. For this set of circumstances this is NOT CRITICAL.</p> <p>RFA Concur 4/29/08</p>	<p> Operator recognizes that the Suggested List does not include 1NI-152B, which should be <u>CLOSED</u>. Operator adds 1NI-152B, CLOSED, Sequence 2.</p> <p>Operator recognizes that the sequence is incorrect. The discharge side (1NI - 144B and 1NI-150B) should be isolated before the suctions (1NI-135B and 1NI-136B) are isolated. Operator changes:</p> <ul style="list-style-type: none"> • 1NI-135B and 136B to Sequence 3. • 1NI-144B and 150B to Sequence 2. <p>* Operator recognizes that the Suggested List does not include 1NI-152B Breaker, which should be <u>OPEN</u>, Sequence 4.</p> <p>Operator recognizes that the Suggested List of Tagged Components is inadequate as written and then identifies above changes.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A2 SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

Component	Position	Sequence
1B NI Pump Motor DC Control Power Fuse Block*	Removed	1 ^A
1B NI Pump Motor Breaker*	Racked Out	1 ^A
1NI - 144B*	CLOSED	2
1NI-152B*	CLOSED	2
1NI-150B*	CLOSED	2
1NI -136B*	CLOSED	2or3
1NI - 135B*	CLOSED	2or3
1NI - 144B Breaker*	OPEN	4 ^A
1NI-152B Breaker*	OPEN	4 ^A
1NI-150B Breaker*	OPEN	4 ^A
1NI -136B Breaker*	OPEN	4 ^A
1NI - 135B Breaker*	OPEN	4 ^A
1NI – 141 (Drain)*	OPEN	5 ^A
1NI – 142 (Drain)*	OPEN	5 ^A

VERIFICATION OF COMPLETION

Component	Position	Sequence
1NI – 140 (Drain)*	OPEN	5 ^A
1NI – 137 (Vent)*	OPEN	5 ^B
1NI – 402 (Vent)*	OPEN	5 ^B
1NI-139 (Drain)	OPEN	5 ^C
1NI-210 (Vent)	OPEN	5 ^C
1NI-858 (Isolation)	CLOSED	5 ^C

NOTES:

* - Denotes Critical Step as modified by Note.

1A – Either one of these actions will satisfy the critical nature of this step.

4A – Breaker must be opened after valve is positioned.

5A - As a MINIMUM, either Drain 1NI –141, or a combination of 1NI-140 and 1NI – 142 are required to be OPEN.

5B – At least ONE Vent is (1NI-137 or 402) required to be OPEN.

5C – These valves are optional.

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is at 100% power.
- A severe seal leak has just been discovered on 1B NI Pump.
- The WCC SRO has informed you that 1NI-149 has a history of seat leakage.
- A List of Suggested Tagged Components has been prepared to Isolate 1B NI Pump.

INITIATING CUE:

The Work Control Center Supervisor has directed you to verify the Mechanical and Electrical Isolation Boundaries needed to isolate the 1B NI Pump for pump repair. Make any corrections if needed.

JPM CUE SHEET

List of Suggested Tagged Components for 1B NI Pump:

Component	Position	Sequence
1B NI Pump Motor Breaker	Racked Out	1
1NI -136B	CLOSED	2
1NI - 135B	CLOSED	2
1NI - 144B	CLOSED	3
1NI-150B	CLOSED	3
1NI -136B Breaker	OPEN	4
1NI - 135B Breaker	OPEN	4
1NI - 144B Breaker	OPEN	4
1NI-150B Breaker	OPEN	4
1NI – 142 (Drain)	OPEN	5
1NI – 140 (Drain)	OPEN	5
1NI – 137 (Vent)	OPEN	5

JPM A3 SRO

Facility: McGuire Task No.: 301OMP007,
315R03001

Task Title: Take On-Site Protective Actions
During a General Emergency JPM No.: 2008 Admin - JPM A3
SRO

K/A Reference: GK/A 2.3.4 (3.7)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- With Unit 1 shutting down due to failed fuel causing high NC System Activity, a LOCA Outside of Containment occurred.
 - A Site Assembly is in progress in accordance with Enclosure 4.3 of RP/0/A/5700/011, and all personnel have NOT been accounted for.
 - An RP technician reports that an operator working with him in the 695 pipe chase has fallen and is severely injured. He has moved the injured person to an area that is somewhat shielded. Due to rapidly increasing dose rates, the RP technician leaves to get help. He believes the injuries are life threatening. He also stated that the individual could be retrieved but it would take two people to do so.
 - The OSM has initiated and completed the immediate and subsequent actions of Enclosure 4.1 of RP/0/A/5700/004, "General Emergency."
 - RP has been contacted and estimates it will take at least ten minutes to retrieve the victim. Auxiliary Building Area Radiation Monitors indicate extremely high radiation levels.
 - Dose rates at the area needing access is greater than 500 Rem/Hr.

Task Standard: Select and dispatch two rescuers by completing Enclosure 4.4 of RP/0/A/5700/004. All critical tasks evaluated as satisfactory.

Required Materials: Calculator

General References: RP/0/A/5700/004, General Emergency
RP/0/A/5700/011, Conducting a Site Assembly, Site Evacuation or
Containment Evacuation.
RP/0/A/5700/29, RP/0/A/5700/29, Notification of Off-Site Agencies From
the Control Room.
OMP 2-2, Conduct of Operations.

Handouts: RP/0/A/5700/004, General Emergency, marked up as follows:

- Section 2 immediate actions are complete.
- Enclosure 4.1 actions are complete.
- Section 3 subsequent actions complete through Step 3.8.1.

Initiating Cue: As the OSM, evaluate, and take on-site Protective Actions in
accordance with Step 3.8.2 of RP/0/A/5700/004, "General Emergency."

Time Critical Task: NO

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout RP/0/A/5700/004 marked up for placekeeping through step 3.8.1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(RP04/Step 3.8.2) IF a situation is immediately hazardous to life or valuable property exists, evaluate potential dose rates by one of the following methods: (Step 3.8.2.a) Contact RP Shift at Ext. 4282.	Operator recognizes from initial conditions that Dose rates at the area needing access is greater than 500 Rem/Hr.		
2	(Step 3.8.2.b) Assess area monitors.	Operator recognizes from initial conditions that Dose rates at the area needing access is greater than 500 Rem/Hr. Operator determines that rescuers will need to be authorized to receive Emergency Exposure Dose Limits. Cue: Provide operator with List of Available Rescuers in Control Room. Indicate that these individuals are available to send for Rescue.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	(Step 3.8.3) Complete Enclosure 4.4 (Request for Emergency Exposure), prior to dispatch of emergency workers if emergency situation precludes documentation.	Operator reviews List of Available Rescuers in Control Room and determines qualification of potential rescuers.		
*4	(Enclosure 4.4.a) Request for Emergency Exposure	Operator determines that Casey cannot be dispatched as a rescuer (Showing signs of pregnancy).		
*5	(Enclosure 4.4.c) Only on a volunteer basis to persons fully aware of the risks involved. All factors being equal, select volunteers above the age of 45 and those who normally receive little exposure.	<p>Operator determines that Cox cannot be dispatched as a rescuer (Does NOT Volunteer).</p> <p>Operator determines that Jones cannot be dispatched as a rescuer (Has too much Lifetime Exposure).</p> <p>Operator determines that Leahy cannot be dispatched as a rescuer (Only STA – OMP 2-2 requires her in Control Room).</p> <p>Operator determines that Taylor cannot be dispatched as a rescuer (< 45 years Old).</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Enclosure 4.4) Request for Emergency Exposure	<p>Operator selects Smith and Kelly as rescuers, and completes Enclosure 4.4.</p> <p>Operator enters the following information on Enclosure 4.4 for Smith:</p> <ul style="list-style-type: none"> • RP Badge # - 2579 • Name – Smith • Age – 52 • Employer – Duke <p>Operator enters the following information on Enclosure 4.4 for Kelly:</p> <ul style="list-style-type: none"> • RP Badge # - 2456 • Name – Kelly • Age – 48 • Employer – Duke <p>Operator has Smith and Kelly Read and Sign Enclosure 4.4.</p> <p>Cue:</p> <p>After having selected rescuers sign Enclosure 4.4, indicate that each has signed.</p> <p>Cue:</p> <p>If Operator seeks concurrence from RPM for authorization of Emergency Exposure Limits, indicate RPM Bob Smith has concurred.</p> <p>Operator signs Enclosure 4.4 indicating that they approve the Emergency Exposure Authorization.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Admin - JPM A3 SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

List of Available Rescuers in Control Room:

RP Badge #	Name	Gender/ Age	Job Assignment	Employer	Current Exposure (yr)	Lifetime Exposure	Special Status
12345	Cox	Male/ 49	Maintenance	Duke	1800 mr	5.2 R	Would prefer not to go/ Reports good physical health
12456	Kelly	Female/ 48	Engineer	Duke	45 mr	400 mr	Volunteers/ Reports good physical health
12567	Jones	Male /45	NLO	Duke	125 mr	35.4 R	Volunteers/ Reports good physical health
12579	Smith	Male/ 52	Training Supervisor	Duke	6 mr	1400 mr	Volunteers/Reports good physical health
12110	Casey	Female/ 32	Security Supervisor	Duke	10 mr	65 mr	Showing signs but NOT Declared Pregnant/Volunteers/ Reports good physical health
12238	Leahy	Female/ 46	STA	Duke	4 mr	120 mr	Volunteers/Only STA qualified individual in Control Room.
12198	Taylor	Male/ 34	U2 BOP	Duke	78 mr	1.7 R	Volunteers/ Reports good physical health

JPM CUE SHEET

INITIAL CONDITIONS:

- With Unit 1 shutting down due to failed fuel causing high NC System Activity, a LOCA Outside of Containment occurred.
- A Site Assembly is in progress in accordance with Enclosure 4.3 of RP/0/A/5700/011, and all personnel have NOT been accounted for.
- An RP technician reports that an operator working with him in the 695 pipe chase has fallen and is severely injured. He has moved the injured person to an area that is somewhat shielded. Due to rapidly increasing dose rates, the RP technician leaves to get help. He believes the injuries are life threatening. He also stated that the individual could be retrieved but it would take two people to do so.
- The OSM has initiated and completed the immediate and subsequent actions of Enclosure 4.1 of RP/0/A/5700/004, "General Emergency."
- RP has been contacted and estimates it will take at least ten minutes to retrieve the victim. Auxiliary Building Area Radiation Monitors indicate extremely high radiation levels.
- Dose rates at the area needing access is greater than 500 Rem/Hr.

INITIATING CUE:

As the OSM, evaluate, and take on-site Protective Actions in accordance with Step 3.8.2 of RP/0/A/5700/004, "General Emergency."

JPM A4 SRO

Facility: McGuire Task No.: 301OMP007,
315R03001

Task Title: Make Protective Action
Recommendations and Perform
Initial Notification JPM No.: 2008 Admin - JPM A4
SRO

K/A Reference: GK/A 2.4.44 (4.4)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- You are the WCC SRO/Off-site Communicator.
 - One hour ago, a LOCA inside containment occurred on Unit 1. The crew implemented EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirc) due to multiple ECCS component failures.
 - A Containment Red Path and a Core Cooling Red Path have occurred. The Emergency Coordinator has just declared a General Emergency per RP/0/A/5700/000, Enclosure 4.1, EAL # 4.1.G.2 (Loss of Any two Barriers AND Potential loss of the third).
 - A Radioactive Release is still in progress above normal limits.
 - Unit 1EMF 38, 39, 40 are all in trip 2.
 - The TSC has NOT been fully activated.
 - Unit 2 is at 100% power.

Task Standard: The ENS Notification form is completed with the appropriate Protective Action Recommendations. All critical tasks evaluated as satisfactory.

Required Materials: Pre-Printed ENF notebook

General References: RP/0/A/5700/000, Classification of Emergencies.
2008 Admin - JPM A4 SRO

RP/0/A/5700/004, General Emergency.

RP/0/B/5700/029, Notification of Offsite Agencies From the Control Room.

Handouts: RP/0/B/5700/029, Notification of Offsite Agencies From the Control Room.

Initiating Cue: The Emergency Coordinator directs you to complete the initial notification form with the appropriate Protective Action Recommendations.

The following Conditions exist:

- Current wind direction is 329.5°.
- Current wind speed is 9 mph.
- Containment pressure is 15 psig

Event declaration time/date is now _____ / _____ (current time/date)

Time Critical Task: YES – 15 minutes (PT/0/A/4600/113, Enclosure 13.21; RP/0/B/5700/029, Enclosure 4.1, Step 1 Table, Step 1).

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout RP/0/B/5700/29.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(2.1) For Initial Notifications, perform Enclosure 4.1 (Completion and Transmission of an Initial Notification Message).	Operator proceeds to Enclosure 4.1.		
2	<p>(Step 1) Make initial notifications according to the following criteria:</p> <p>Initial Notifications {G-07-0127}</p> <p>1. Initial notifications to the State(s) and counties must be made within 15 minutes of the event declaration using the Emergency Notification form (ENF).</p> <p>2. For an upgrade in classification prior to or while transmitting an initial message:</p> <ul style="list-style-type: none"> ○ The notification for the lesser emergency classification must be made within 15 minutes of the lesser classification declaration time. ○ The agencies must be informed that an upgrade in classification will be coming. 	<p>Operator recognizes that this message must be made within 15 minutes.</p> <p>Operator reads notes and proceeds to step 2.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	<ul style="list-style-type: none"> o The upgraded classification message must be transmitted within 15 minutes of the upgraded classification declaration time. 			
3	(Step 2) Complete an Emergency Notification Form by one of the following: Obtain a preprinted ENF. OR Obtain a blank ENF.	Note: Evaluator should have the Pre-Printed ENF notebook available for use		
4	(Note prior to Step 2.1) messages are sequentially numbered throughout the drill/event.	Operator reads Note.		
5	(Step 2.1) Complete Line 1 as follows: (Step 2.1.1) Check A (Drill) OR B (Actual Event) (Step 2.1.2) Record message number)	Cue: This is a drill. Operator checks A Drill Cue: This is message # 1. Operator writes message number 1.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Note prior to Step 2.2) Notification Time and Date will be completed during message transmission.	Operator reads Note.		
7	(Step 2.2) On Line 2 check A (initial).	Operator checks "initial" on Line 2.		
8	(Step 2.3) Complete Line 3 as follows: (Step 2.3.1) Record "McGuire Nuclear Site" as Site. (Step 2.3.2) Record "(704) 875-6044" as confirmation telephone number.	Operator records McGuire Nuclear Site" as Site on Line 3. Operator records "(704) 875-6044" as confirmation telephone number on Line 3.		
9	(Step 2.4) Complete Line 4 as follows: (Step 2.4.1) Check correct Emergency Classification. (Step 2.4.2) Record EAL (IC) number. (Step 2.4.3) Record EAL (IC) description.	Operator checks "D" for GENERAL EMERGENCY on Line 4. Operator enters "EAL # 4.1.G.2." Operator enters description such as: "Loss of Any Two Fission Product Barriers <u>AND</u> the Potential Loss of the Third. Plant operators will recommend protective actions for the public." OR Selects correct pre-printed form.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	<p>(Step 2.5) Complete Line 5 as follows:</p> <p>(Step 2.5.1) IF Notification of Unusual Event, Alert, or Site Area Emergency...</p> <p>(Step 2.5.2) IF General Emergency perform the following:</p> <p>(A) Determine Protective Actions Recommendations per Enclosure 4.4 (Protective Action Recommendations)</p>	<p>Operator recognizes that this step is NA.</p> <p>Operator proceeds to Enclosure 4.4.</p>		
11	<p>(Enclosure 4.4/Step 1) IF a General Emergency is declared, determine Initial Protective Action Recommendations as follows (PIP-M-02-6163):</p> <p>1.1 Obtain the wind speed and direction, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed) and point #8 (Average Upper Wind Direction).</p> <p>Wind Direction (Point 8) _____</p> <p>Wind Speed (Point 5): _____</p>	<p>NOTE TO EXAMINER: Operator may use chart on Enclosure 4.4, page 2 of 8. It bypasses page 3 of 8. They may also skip the chart and go to page 3 of 8. Either method is acceptable.</p> <p>Operator records wind speed and direction from initial conditions.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 1.2) IF chart recorder unavailable....	Operator recognizes this step is NA and proceeds to next step.		
13	(Step 2) If wind speed less than or equal to 5 mph, recommend the following.....	Operator recognizes that wind speed is NOT less than 5 mph, and continues on to Step 3.		
14	<p>(Step 3) If wind speed is greater than 5 mph, evacuate and shelter zones as shown in the table below based on wind direction.</p> <p>(Step 2 Caution 1)</p> <p>1. Once a zone is selected for evacuation, it should not be removed. {PIP-M-03-3483}</p> <p>(Step 2 Caution 2)</p> <p>* 2. A short term release is any release that can be projected to be 3 hours or less in duration. An example would be a "puff release". A controlled</p> <p>* release is one that can be started and stopped at the licensee's discretion, such as the venting of Containment for pressure control. IF a release is short term and controlled, THEN sheltering in lieu of evacuation should be considered. {PIP-M-05-3631}</p>	<p>Operator reads Caution 1.</p> <p>Operator reads Caution 2, and recognizes that it is unknown when the release will be stopped.</p> <p>Operator addresses Table and uses wind direction row labeled 315.1-337.5.</p> <p>Operator determines that zones B, C, D, L, M and R must be evacuated for a 2 mile radius, and 5 miles downwind.</p> <p>Operator determines that zones A, E, F, G, H, I, J, K, N, O, P, Q, And S must be sheltered.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	(Step 4) If notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy.	Operator recognizes that this Step is NA, and does not check D on Line 5 of ENF. Cue: Dose projections are not available at this time.		
16	(Step 5) For any other Protective Action Recommendation, Check E (Other) and record information.	Operator recognizes that this Step is NA, and does not check E on Line 5 of ENF.		
17	(Step 6) After initial PARs are transmitted to offsite agencies, check for large fission product inventory in Containment as follows...	Operator recognizes that this Step is NA, and proceeds to next step.		
18	(Step 7) If Containment radiation level exceeds limits in Step 6.3,	Operator recognizes that this Step is NA, and proceeds to next step.		
19	(Step 8) A McGuire EPZ map is located on page 8 of 8, if it is desired to visually see zones evacuated or sheltered.	Operator reads Step.		
20	(Step 9) If notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy.	Operator recognizes that this Step is NA, and proceeds to Step 10. Cue: Dose projections are not available at this time.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 10) On a continuing basis, evaluate plant conditions for the need to update PARs. This evaluation should include EMF51A/B readings, wind speed and direction...	Operator reads Step and proceeds.		
22	(Step 11) Review dose projections with the on-shift dose assessor (if available) to determine if Protective Action Recommendations are required beyond the 10-mile EPZ.	Operator recognizes that this Step is NA, and proceeds to Step 12. Cue: Dose assessor is not available at this time.		
23	(Step 12) IF Protective Action Recommendations are required beyond 10 miles, notify the states and counties and request that they consider sheltering / evacuating the general populations located beyond the affected 10-mile EPZ.	Operator recognizes that this Step is currently NA, and returns to Step 2.5.2 B of Enclosure 4.1.		
*24	(Step 2.5.2.B) Check B (Evacuate) and record affected zones for evacuation.	Operator checks B on Line 5 of ENF and records zones B, C, D, L, M and R as evacuate zones.		
*25	(Step 2.5.2.C) Check C (Shelter) and record affected zones for sheltering.	Operator checks C on Line 5 of ENF and records, zones A, E, F, G, H, I, J, K, N, O, P, Q, and S must be sheltered.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
26	(Step 2.5.2.D) IF notified by RP Dose Assessment that dose projections or field measurements indicate Thyroid dose will be equal to or greater than 5 Rem, check D	<p>Operator recognizes that this Step is NA, and does not check D on Line 5 of ENF. Operator proceeds on to Step 2.5.2.E.</p> <p>Cue:</p> <p>Dose projections are not available at this time.</p>		
27	(Step 2.5.2.E) For any other Protective Action Recommendation, check E (Other) and record information.	Operator recognizes that this Step is NA, and does not check E on Line 5 of ENF.		
28	(Note prior to Step 2.6) An Emergency Release is an unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to the declared emergency.	Operator reads Note.		
29	<p>(Step 2.6) Complete Line 6 as follows:</p> <p>(Step 2.6.1) IF any of the following exists, check B (Is Occurring) or C (Has occurred) as appropriate:</p> <ul style="list-style-type: none"> EMF 38, 39, or 40 readings indicate an increase <u>AND</u> containment pressure greater than 0.3 psig. 	Operator recognizes from initial conditions that the release (Is occurring) and checks B due to EMF-38, 39, or 40 readings in Trip 2 (assume this due to LOCA inside containment) and containment pressure greater than 0.3 psig (Red Path in Containment).		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
30	(Step 2.6.2) If no emergency release exists, Check A (None).	Operator recognizes that there is an on-going release and that this step is NA (Continues on to Step 2.7)		
31	(Step 2.7) Complete Line 7 as follows: (Step 2.7.1) If no release is in progress, Check A (Not Applicable), Go to Step 2.8.	Operator recognizes that there is an on-going release and that this step is NA (Continues on to Step 2.7.2)		
32	(Note prior to Step 2.7.2) Release significance is determined by RP.	Operator reads Note.		
33	(Step 2.7.2) IF release significance is known, check B (Within normal operating limits) OR C (Above normal operating limits) as appropriate, GO TO Step 2.8	Operator checks C (Above normal operating limits) after receiving the following cue: Cue: RP has determined the release is above normal operating limits. Operator goes to Step 2.8		
34	(Step 2.8) Complete Line 8 by checking appropriate block: A: Improving B: Stable C: Degrading	Operator checks B (Stable) after receiving the following cue: Cue: Plant is Stable. Operator goes to Step 2.9		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
35	(Note prior to Step 2.9) Information for Line 9 may not be available and is not required for initial notifications.	Operator reads Note.		
36	(Step 2.9) Complete Line 9 as follows: (Step 2.9.1) Record wind direction (1EEBCR9100, point 8, or OAC point, M1P0847). (Step 2.9.2) Record wind speed (1EEBCR9100, point 5, or OAC point, M1P0848). (Step 2.9.3) If time allows, record precipitation type.	Operator records wind direction of 329.5° (From initial conditions). Operator records wind speed of 9 mph. (From initial conditions). Operator may N/A step. Cue if needed: There is no precipitation.		
37	(Note prior to Step 2.9.4) Stability class is determined by RP.	Operator reads Note.		
38	(Step 2.9.4) If time allows, check appropriate Stability Class.	Operator N/A's Step and proceeds.		
39	(Step 2.10) Complete Line 10 as follows: (Step 2.10.1) Check A (Declaration). (Step 2.10.2) Record declaration Time and Date.	Operator checks A (Declaration). Operator records time and date when JPM was started.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
40	(Step 2.11) Complete Line 11 as follows: (Note prior to Step 2.11) The following Step may not be all inclusive of all events that may affect all units.	Operator reads Note.		
41	(Step 2.11.1) Evaluate the following classification for both units: <ul style="list-style-type: none"> • Security Event • Seismic Event • Tornado on site • Hurricane force winds on site • Loss of both switchyards • Fire in SSF • Fire affecting shared safety related equipment. 	Operator recognizes that none of the identified events has affected either Unit 1 or Unit 2.		
42	(Step 2.11.2) IF event affects the emergency class on both units equally, check All.	The operator recognizes that the event does NOT affect Unit 2 and does NOT check ALL.		
43	(Step 2.11.3) IF event only affects (1) unit OR one (1) unit has a higher emergency class, check appropriate unit.	Operator recognizes that the events affect Unit 1 only and checks Unit 1 on Line 11.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
44	(Step 2.12) Complete Line 12 as follows: <ul style="list-style-type: none"> ○ Check box for affected unit(s) ○ Record Unit Status for both units 	After cue, Operator checks A, records Unit 1 at 0% power on 0800, 5/12/08. Operator records Unit 2 at 100% power. Cue: Unit 1 was tripped 60 minutes ago, and Unit 2 is at 100% power.		
45	(Step 2.13) On Line 13, record any additional information as directed by the Emergency Coordinator.	Operator leaves blank.		
46	(Step 2.14) Complete Line 17 as follows: (a) Have the Emergency Coordinator approve. (b) Record Time and Date. (Note prior to c) Received by and Time/Date is for State and County use. (c) Record your name on Notified By.	Operator recognizes that the follow-up notification is due to a change in PAR. Operator completes Line 17 by having the EC approve. Note: Examiner, as EC, sign "Approved By" space on Line 17. Operator records present time and Date. Operator reads Note. Operator records their name in "Notified By" space on Line 17.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
47	(Step 3) Transmit the message to Offsite Agencies as described below.....	Cue: The message has been transmitted.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

TIME CRITICAL STOP TIME: _____

JPM CUE SHEET

Initial Conditions:

- You are the WCC SRO/Off-site Communicator.
- One hour ago, a LOCA inside containment occurred on Unit 1. The crew implemented EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirc) due to multiple ECCS component failures.
- A Containment Red Path and a Core Cooling Red Path have occurred. The Emergency Coordinator has just declared a General Emergency per RP/0/A/5700/000, Enclosure 4.1, EAL # 4.1.G.2 (Loss of Any two Barriers AND Potential loss of the third).
- A Radioactive Release is still in progress above normal limits.
- Unit 1 EMF 38, 39, 40 are all in trip 2.
- The TSC has NOT been fully activated.
- Unit 2 is at 100% power.

INITIATING CUE:

The Emergency Coordinator directs you to complete a notification to the state and counties using RP/0/B/5700/029 (Notifications to Offsite Agencies from the Control Room) with the appropriate Protective Action Recommendations.

The following Conditions exist:

- Current wind direction is 329.5°.
- Current wind speed is 9 mph.
- Containment pressure is 15 psig.

Event declaration time/date is now _____ / _____ (current time/date)

This JPM is TIME CRITICAL

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

- 1. DRILL ACTUAL EVENT MESSAGE # 1
- 2. INITIAL FOLLOW-UP NOTIFICATION: TIME _____ DATE ____ / ____ / ____ AUTHENTICATION # _____
- 3. SITE: McGuire Nuclear Site Confirmation Phone # (704) 875-6044

4. EMERGENCY CLASSIFICATION: UNUSUAL EVENT ALERT SITE AREA EMERGENCY GENERAL EMERGENCY
 BASED ON EAL# 4.1.G.2 EAL DESCRIPTION: Loss of Any Two Fission Product Barriers and Potential Loss of the Third

5. PROTECTIVE ACTION RECOMMENDATIONS: NONE
 EVACUATE B, C, D, L, M and R
 SHELTER A, E, F, G, H, I, J, K, N, O, P, Q, and S
 CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.
 OTHER _____

6. EMERGENCY RELEASE: None Is Occurring Has Occurred

7. RELEASE SIGNIFICANCE: Not applicable Within normal operating limits Above normal operating limits Under Evaluation
 8. EVENT PROGNOSIS: Improving Stable Degrading
 9. METEOROLOGICAL DATA: Wind Direction* from 329.5 degrees Wind Speed* 9 mph
 (* May not be available for Initial Notifications) Precipitation* None Stability Class* A B C D E F G

10. DECLARATION TERMINATION Time Event Start Time Date Today / Today / Today
 11. AFFECTED UNIT(S): 1 2 3 All
 12. Unit Status: (Unaffected Unit(s) Status Not Required for Initial Notifications)
 U1 0 % Power Shutdown at: Time T minus 60 Date TODAY / TODAY / TODAY
 U2 100 % Power Shutdown at: Time _____ Date ____ / ____ / ____
 U3 _____ % Power Shutdown at: Time _____ Date ____ / ____ / ____

13. REMARKS: _____

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: Elevated Mixed Ground UNITS: Ci Ci/sec µCi/sec
 MAGNITUDE: Noble Gases: _____ Iodines: _____ Particulates: _____ Other: _____
 FORM: Airborne Start Time: _____ Date: ____ / ____ / ____ Stop Time _____ Date ____ / ____ / ____
 Liquid Start Time: _____ Date: ____ / ____ / ____ Stop Time _____ Date ____ / ____ / ____

15. PROJECTION PARAMETERS: Projection Period: _____ Hours Estimated Release Duration: _____ Hours
 Projection performed: Time _____ Date ____ / ____ / ____

16. PROJECTED DOSE: DISTANCE TEDE (mrem) Adult Thyroid CDE (mrem)
 Site boundary _____
 2 Miles _____
 5 Miles _____
 10 Miles _____

17. APPROVED BY _____ Title: Emergency Coordinator Time: Stop Time Date TODAY / TODAY / TODAY

NOTIFIED BY: Applicant's Name RECEIVED BY: _____ Time: _____ Date ____ / ____ / ____

<p>Duke Energy McGuire Nuclear Station</p> <p>NOTIFICATIONS TO OFFSITE AGENCIES FROM THE CONTROL ROOM</p>	Procedure No. RP/0/B/5700/029
	Revision No. 009
<p>Reference Use</p>	Electronic Reference No. MP0072VO

PERFORMANCE
<p>This Procedure was printed on 04/29/08 at 10:25:23 from the electronic library as:</p> <p style="text-align: center;">(ISSUED) - PDF Format</p> <p>Compare with Control Copy every 14 calendar days while work is being performed.</p> <p>Compared with Control Copy _____ Date _____</p> <p>Compared with Control Copy _____ Date _____</p> <p>Compared with Control Copy _____ Date _____</p>





Date(s) Performed	Work Order/Task Number (WO#)
-------------------	------------------------------

COMPLETION
<p><input type="checkbox"/> Yes <input type="checkbox"/> NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> NA Required enclosures attached?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> NA Procedure requirements met?</p>

Verified By	Date
-------------	------

Procedure Completion Approved	Date
-------------------------------	------

Remarks <i>(attach additional pages, if necessary)</i>
--

IMPORTANT: Do NOT mark on barcodes.	Procedure No.  *RP/0/B/5700/029*	Revision No.  *009*
Enclosure Number  *FULL*	Printed Date  *04/29/2008*	

Notifications to Offsite Agencies from the Control Room

1. Symptoms

Events are in progress or have occurred that require implementing the McGuire Emergency Plan and notification of offsite agencies. {PIP-M-02-2012}

2. Immediate Actions

- 2.1 For Initial Notifications, perform Enclosure 4.1 (Completion and Transmission of an Initial Notification Message).

3. Subsequent Actions

- 3.1 For Follow-up Notifications, perform Enclosure 4.2 (Completion and Transmission of a Follow-up Notification Message).
- 3.2 For Termination Messages, perform Enclosure 4.3 (Completion and Transmission of a Termination Notification Message).

4. Enclosures

- 4.1 Completion and Transmission of an Initial Notification Message
- 4.2 Completion and Transmission of a Follow-up Notification Message
- 4.3 Completion and Transmission of a Termination Notification Message
- 4.4 Offsite Protective Action Recommendations
- 4.5 NRC Event Notification Worksheet
- 4.6 County Emergency Response Radio

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

1. Make initial notifications according to the following criteria:

Initial Notifications {G-07-0127}

1. Initial notifications to the State(s) and counties must be made within 15 minutes of the event declaration using the Emergency Notification form (ENF).
2. For an upgrade in classification prior to or while transmitting an initial message:
 - The notification for the lesser emergency classification must be made within 15 minutes of the lesser classification declaration time.
 - The agencies must be informed that an upgrade in classification will be coming.
 - The upgraded classification message must be transmitted within 15 minutes of the upgraded classification declaration time.

2. Complete an Emergency Notification Form by one of the following:

- Obtain a preprinted ENF.

OR

- Obtain a blank ENF.

NOTE: Messages are sequentially numbered throughout the drill/event beginning with message number 1, and continues until termination of the drill/event.

- 2.1 Complete Line 1 as follows:

- 2.1.1 Check A (Drill) **OR** B (Actual Event).
- 2.1.2 Record message number.

NOTE: Notification Time, Date, and Authentication will be completed during message transmission.

- 2.2 On Line 2 check A (Initial).

- 2.3 Complete Line 3 as follows:

- 2.3.1 Record "McGuire Nuclear Site" as Site.
- 2.3.2 Record (704) 875-6044 as confirmation telephone number.

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029
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2.4 Complete Line 4 as follows:

- 2.4.1 Check correct emergency classification.
- 2.4.2 Record EAL (IC) number.
- 2.4.3 Record the EAL (IC) description.

2.5 Complete Line 5 as follows:

- _____ 2.5.1 **IF** Notification of Unusual Event, Alert, **OR** Site Area Emergency check A (None), **GO TO** Step 2.6.
- _____ 2.5.2 **IF** General Emergency, perform the following:
 - A. Determine Protective Action Recommendations per Enclosure 4.4 (Offsite Protective Action Recommendations).
 - B. Check B (Evacuate) and record affected zones for evacuation.
 - C. Check C (Shelter) and record affected zones for sheltering.
 - _____ D. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate Thyroid dose will be equal to or greater than 5 Rem, check D. {PIP-G-03-606}
 - E. For any other Protective Action Recommendations, check E (Other) and record information.

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

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NOTE: An Emergency Release is an unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to the declared emergency. {PIP-M-97-4256} {FAM Sect. 3.7, rev. 7}

2.6 Complete Line 6 as follows:

_____ 2.6.1 **IF** any of the following exists, check B (is occurring) **OR** C (has occurred) as appropriate: {PIP-M-03-2358}

- EMF 38, 39 or 40 readings indicate an increase **AND** containment pressure greater than 0.3 psig
- EMF 38, 39 or 40 readings indicate an increase **AND** a known leak path exists from containment
- EMF 35, 36 or 37 readings indicate an increase in activity
- EMF 33 or other alternate means indicate Steam Generator tube leakage
- A known release path exists
- Alternate method of release determination.

_____ 2.6.2 **IF** no emergency release exists, check A (None).

2.7 Complete Line 7 as follows:

_____ 2.7.1 **IF** no release in progress, check A (Not applicable), **GO TO** Step 2.8.

NOTE: Release significance is determined by RP.

_____ 2.7.2 **IF** release significance is known, check B (Within normal operating limits) **OR** C (Above normal operating limits) as appropriate, **GO TO** Step 2.8.

_____ 2.7.3 **IF** release significance is unknown, check D (Under Evaluation).

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029
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2.8 Complete Line 8 by checking appropriate block:

A (IMPROVING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage frequency) are trending favorably toward expected or desired values **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.
- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) have become less of a threat to plant operations or personnel safety **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

B (STABLE): Plant conditions are neither DEGRADING nor IMPROVING.

C (DEGRADING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage, frequency) are trending unfavorably away from expected or desired values **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.
- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) impacting plant operations or personnel safety are worsening **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

NOTE: Information for Line 9 may not be available and is not required for initial notifications.

_____ 2.9 **IF** required, complete Line 9 as follows:

2.9.1 Record wind direction. (1EEBCR9100, point 8, or OAC point, M1P0847)

2.9.2 Record wind speed. (1EEBCR9100, point 5, or OAC point, M1P0848)

_____ 2.9.3 **IF** time allows, record precipitation type.

NOTE: Stability class is determined by RP.

_____ 2.9.4 **IF** time allows, check appropriate stability class.

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029
Page 5 of 8

2.10 Complete Line 10 as follows:

- 2.10.1 Check A (Declaration).
- 2.10.2 Record declaration time and date.

2.11 Complete Line 11 as follows:

NOTE: The following step may not be all inclusive of all events that may affect all units.

- 2.11.1 Evaluate the following for applicability to both units. {PIP-0-M-97-4638, PIP M-03-3294}

- Security event
- Seismic event
- Tornado on site
- Hurricane force winds on site
- Loss of both switch yards
- Fire in SSF
- Fire affecting shared safety related equipment.

_____ 2.11.2 **IF** event affects the emergency class on both units equally, check All.

_____ 2.11.3 **IF** event only affects one (1) unit **OR** one (1) unit has a higher emergency class, check appropriate unit.

2.12 Complete Line 12 as follows:

- Check box for affected unit(s)
- Record Unit Status for both units

2.13 On Line 13, record any additional information as directed by the Emergency Coordinator.

2.14 Complete Line 17 as follows:

- 2.14.1 Have the Emergency Coordinator approve.
- 2.14.2 Record time/date.

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029
Page 6 of 8

NOTE: Received By and Time/Date is for State and County use.

- 2.14.3 Record your name on Notified By.
- 3. Transmit the message to Offsite Agencies as described below.
 - 3.1 Use the table below to establish the transmittal frequencies:

Initial Notifications {G-07-0127}

- 1. Initial notifications to the State(s) and counties must be made within 15 minutes of the event declaration using the Emergency Notification form (ENF).
- 2. For an upgrade in classification prior to or while transmitting an initial message:
 - The notification for the lesser emergency classification must be made within 15 minutes of the lesser classification declaration time.
 - The agencies must be informed that an upgrade in classification will be coming.
 - The upgraded classification message must be transmitted within 15 minutes of the upgraded classification declaration time.

- 3.2 Establish communications with Offsite Agencies as follows:

- 3.2.1 Use the Selective Signaling Telephone by depressing "*" (star) 1".
- _____ 3.2.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:
 - A. Iredell County: 9-704-878-3039
 - B. Mecklenburg County: 9-704-943-6200
 - C. Gaston County: 9-704-866-3300
 - D. Lincoln County: 9-704-735-8202
 - E. Catawba County: 9-828-464-3112
 - F. NC EOC: 9-919-733-3943
 - G. Cabarrus County: 9-704-920-3000

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029
Page 7 of 8

NOTE: State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.

_____ 3.2.3 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

NOTE: Notification Time is the time the first agency is contacted.

- 3.3 Record Notification Time and Date on Line 2.
- 3.4 Place a check mark by the state and counties listed on back of form as they come on line.
- 3.5 Advise the state and counties you have an emergency notification from the McGuire Control Room and to get out an Emergency Notification Form.

NOTE: Message authentication is only required if message transmittal is other than via Selective Signaling.

_____ 3.6 **IF** message is being transmitted on Selective Signaling, **GO TO** Step 3.8.

_____ 3.7 **WHEN** you reach Line 2, perform the following:

- 3.7.1 **REFER TO** Authentication Codeword List.
- 3.7.2 Ask the State or a County to authenticate the message.
- 3.7.3 Provide appropriate Codeword.
- 3.7.4 Record the Number on Line 2.
- 3.8 Beginning with Line 1, slowly read the complete message line by line, allowing the receivers ample time to copy.
- 3.9 After communicating the message, ask if there are any questions.
- 3.10 Record each individual's name, date and time on the back of the form. (This time is the same time as Line 2.)
- _____ 3.11 **IF** unable to contact any agency, continuous attempts must be made to contact the missing agency (agencies).
- _____ 3.12 **WHEN** the missing agency is contacted, record the name, date and time the agency was contacted on the back of the form.

Enclosure 4.1
Completion and Transmission of an Initial
Notification Message

RP/0/B/5700/029

Page 8 of 8

3.13 FAX a copy (front page only) to the agencies as follows:

- 3.13.1 Insert the Emergency Notification Form face down in the FAX.
- 3.13.2 Press "GROUP FAX" button.
- 3.13.3 Press "SEND/RECEIVE" button.

3.14 **IF** any programmed fax button fails, **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX numbers.

- 4. The Emergency Coordinator shall make follow-up notifications to State and County authorities utilizing Enclosure 4.2 (Completion and Transmission of a Follow up Notification).
- 5. Notify the NRC Operations Center by completing Enclosure 4.5 (NRC Event Notification Worksheet).
- 6. Transmit Enclosure 4.5 (NRC Event Notification Worksheet) (fax, then verbally call the NRC Operations Center) immediately but no later than 1 hour of the event declaration using RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.2 (NRC Telephone Numbers).
- 7. **WHEN** this enclosure has been completed, inform the OSM, reporting any deficiencies or problems encountered.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 1 of 8

NOTE: New initial messages for higher classification upgrades are addressed in Enclosure 4.1. {PIP-M-01-3711}

1. Make follow-up notifications according to the following table:

Follow-up Notifications

1. Follow-up notifications to the State(s) and Counties must be made according to the following schedule:

-For a NOUE, every 4 hours until the emergency is terminated. For ALERT, SAE, or GE every hour until the emergency is terminated.

OR

-If there is any significant change to the situation (make notification as soon as possible).

OR

-As agreed upon with an Emergency Management official from each individual agency. Documentation shall be maintained for any agreed upon schedule change. The interval for ALERT, SAE, and GE shall not be greater than 2 hours to any agency.

2. If a follow-up is due and an upgrade to a higher classification is declared, there is no need to complete the follow-up ENF. In this case, the offsite agencies must be notified that the pending follow-up is being superseded by an upgrade to a higher classification and information will be provided.
3. Follow-up messages in the General Emergency classification that involve an upgrade in PARs must be communicated to the offsite agencies as soon as possible and within 15 minutes.

2. Complete an Emergency Notification Form by one of the following:

Obtain a preprinted ENF.

OR

Obtain a blank ENF.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 2 of 8

NOTE: Messages are sequentially numbered throughout the drill/event.

2.1 Complete Line 1 as follows:

- 2.1.1 Check A (Drill) **OR** B (Actual Event).
- 2.1.2 Record message number.

NOTE: Notification Time and Date will be completed during message transmission.

2.2 On Line 2 check B (Follow-up).

2.3 Complete Line 3 as follows:

- 2.3.1 Record "McGuire Nuclear Site" as Site.
- 2.3.2 Record (704) 875-6044 as confirmation telephone number.

2.4 Complete Line 4 as follows:

- 2.4.1 Check correct emergency classification.
- 2.4.2 Record EAL (IC) number.
- 2.4.3 Record EAL (IC) description.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 3 of 8

2.5 Complete Line 5 as follows:

_____ 2.5.1 **IF** Notification of Unusual Event, Alert, **OR** Site Area Emergency check A (None), **GO TO** Step 2.6.

_____ 2.5.2 **IF** General Emergency perform the following:

A. Determine Protective Action Recommendations per Enclosure 4.4 (Protective Action Recommendations).

CAUTION: Once a zone is selected for evacuation, it may never be removed. {PIP-M-03-3483}

B. Check B (Evacuate) and record affected zones for evacuation.

C. Check C (Shelter) and record affected zones for sheltering.

_____ D. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate Thyroid dose will be equal to or greater than 5 Rem, check D. {PIP-G-03-606}

E. For any other Protective Action Recommendation, check E (Other) and record information.

NOTE: An Emergency Release is an unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to the declared emergency. {PIP-M-97-4256} {FAM Sect. 3.7, rev. 7}

2.6 Complete Line 6 as follows:

_____ 2.6.1 **IF** any of the following exists, check B (Is occurring) or C (Has occurred) as appropriate: {PIP-M-03-2358}

- EMF 38, 39 or 40 readings indicate an increase **AND** containment pressure greater than 0.3 psig
- EMF 38, 39 or 40 readings indicate an increase **AND** a known leak path exists from containment
- EMF 35, 36 or 37 readings indicate an increase in activity
- EMF 33 or other alternate means indicate Steam Generator tube leakage.
- A known release path exists
- Alternate method of release determination.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 4 of 8

_____ 2.6.2 **IF** no emergency release exists, check A (None).

2.7 Complete Line 7 as follows:

_____ 2.7.1 **IF** no release in progress, check A (Not applicable), **GO TO** Step 2.8.

NOTE: Release significance is determined by RP.
--

_____ 2.7.2 **IF** release significance is known, check B (Within normal operating limits) **OR** C (Above normal operating limits) as appropriate, **GO TO** Step 2.8.

_____ 2.7.3 **IF** release significance is unknown, check D (Under evaluation).

2.8 Complete Line 8 by checking appropriate block:

A (IMPROVING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage frequency) are trending favorably toward expected or desired values **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.
- Site conditions (ex. wind, ice/snow, ground tremors; hazardous/toxic/radioactive material leak, fire, security events) have become less of a threat to plant operations or personnel safety **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

B (STABLE): Plant conditions are neither DEGRADING nor IMPROVING.

C (DEGRADING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage, frequency) are trending unfavorably away from expected or desired values **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.
- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) impacting plant operations or personnel safety are worsening **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 5 of 8

2.9 Complete Line 9 as follows:

- 2.9.1 Record wind direction. (1EEBCR9100, point 8, or OAC point, M1P0847)
- 2.9.2 Record wind speed. (1EEBCR9100, point 5, or OAC point, M1P0848)
- 2.9.3 Record precipitation type.

NOTE: Stability class is determined by RP.

- 2.9.4 Check appropriate stability class.

2.10 Complete Line 10 as follows:

- 2.10.1 Check A (Declaration).
- 2.10.2 Record declaration time and date.

2.11 Complete Line 11 as follows:

NOTE: The following step may not be all inclusive of all events that may affect all units.

- 2.11.1 Evaluate the following for classification for both units. {PIP-0-M-97-4638, M-03-3294}
 - Security event
 - Seismic event
 - Tornado on site
 - Hurricane force winds on site
 - Loss of both switch yards.
 - Fire in SSF
 - Fire affecting shared safety related equipment.

_____ 2.11.2 **IF** event affects the emergency class on both units equally, check All.

_____ 2.11.3 **IF** event only affects one (1) unit **OR** one (1) unit has a higher emergency class, check appropriate unit.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 6 of 8

2.12 Complete Line 12 by checking affected unit(s) **AND** recording unit status for both units.

2.13 On Line 13, record any additional information as directed by the Emergency Coordinator.

_____ 2.14 **IF** the follow-up notification is due to a change in Protective Action Recommendations, perform the following

A. Complete Line 17 as follows:

a) Have the Emergency Coordinator approve.

b) Record time/date.

NOTE: Received By and Time/Date is for State and County use.

c) Record your name on Notified By.

d) Transmit the message per Enclosure 4.1 (Completion and Transmission of an Initial Notification), Step 3.

_____ 2.15 **IF** A (NONE) was checked on Line 6, **GO TO** Step 2.20.

_____ 2.16 **IF** a copy of HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment), Enclosure 5.3 (Completing Radiological Portion of Emergency Notification Form), page 4 of 4, is available perform the following:

_____ 2.16.1 Write SEE ATTACHED, across the lines 14, 15 and 16 on the ENF.

_____ 2.16.2 Fax this page with the ENF.

_____ 2.16.3 **GO TO** Step 2.20.

NOTE: The following information is obtained from RP.

2.17 Complete Line 14 as follows:

2.17.1 For release type, check C (Ground).

2.17.2 For Units check B (Ci/sec).

2.17.3 Complete magnitude for type of release.

2.17.4 Check A (Airborne), **OR** B (Liquid) as appropriate and record release start and/or stop times as appropriate.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029
Page 7 of 8

2.18 Complete Line 15 by recording the following:

- 2.18.1 Projection period (hours).
- 2.18.2 Estimated Release Duration (hours).
- 2.18.3 Projection performed (Time/Date).

2.19 Complete Line 16 by recording projected doses.

2.20 Complete Line 17 as follows:

- 2.20.1 Have the Emergency Coordinator approve.
- 2.20.2 Record time/date.

NOTE: Received By and Time/Date is for State and County use.

2.20.3 Record your name on Notified By.

_____ 2.21 **WHEN** message is ready to be transmitted, record notification Time/Date on Line 2.

2.22 Fax a copy (front page only) of the ENF and if available, HP/0/B/1009/021 (Initial Response On-Shift Dose Assessment), Enclosure 5.3 (Completing Radiological Portion of Emergency Notification Form), page 3 of 3 to the Agencies as follows:

- 2.22.1 Insert Emergency Notification Form face down in the FAX.
- 2.22.2 Press "GROUP FAX" button.
- 2.22.3 Press "SEND/RECEIVE" button.

_____ 2.23 **IF** any programmed fax button fails, **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX numbers.

Enclosure 4.2
Completion and Transmission of a
Follow-up Message

RP/0/B/5700/029

Page 8 of 8

2.24 Establish communications with Offsite Agencies as follows:

2.24.1 Use the Selective Signaling Telephone by depressing "*" (star) 1".

2.24.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:

- | | | | |
|--------------------------|----|---------------------|-----------------|
| <input type="checkbox"/> | A. | Iredell County: | 9-704-878-3039 |
| <input type="checkbox"/> | B. | Mecklenburg County: | 9-704-943-6200 |
| <input type="checkbox"/> | C. | Gaston County: | 9-704-866-3300 |
| <input type="checkbox"/> | D. | Lincoln County: | 9-704-735-8202 |
| <input type="checkbox"/> | E. | Catawba County: | 9-828-464-3112 |
| <input type="checkbox"/> | F. | NC EOC: | 9-919-733-3943 |
| <input type="checkbox"/> | G. | Cabarrus County: | 9-704-920-3000. |

<p>NOTE: State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.</p>

2.24.3 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

2.25 Ensure the following {PIP-M-04-735}:

2.25.1 FAX was received.

2.25.2 Answer any questions.

2.25.3 Record the individuals' name, date and time on the back of the notification form. (This time is the same time as Line 2.)

Enclosure 4.3
Completion and Transmission of a
Termination Message

RP/0/B/5700/029
Page 1 of 3

NOTE: Messages are sequentially numbered throughout the drill/event.

1. Obtain and complete a copy of a blank Emergency Notification Form as follows:

1.1 Complete Line 1 as follows:

- 1.1.1 Check if A (Drill) **OR** B (Actual Event).
- 1.1.2 Record message number.

NOTE: Notification Time and Date on Line 2 will be completed during message transmission.

1.2 Complete Line 3 as follows:

- 1.2.1 Record "McGuire Nuclear Station" as Site.
- 1.2.2 Record (704) 875-6044 as confirmation telephone number.

1.3 Complete Line 10 as follows:

- 1.3.1 Check B (Termination).
- 1.3.2 Record time/date event terminated.

1.4 On Line 13, record any additional information as directed by the Emergency Coordinator.

1.5 Complete Line 17 as follows:

- 1.5.1 Have Emergency Coordinator approve.
- 1.5.2 Record date/time.

NOTE: Received By and Time and Date is for State and County use.

- 1.5.3 Record your name on Notified By.

Enclosure 4.3
Completion and Transmission of a
Termination Message

RP/0/B/5700/029
Page 2 of 3

2. Transmit the message to offsite agencies as follows:

2.1 Establish communication with offsite agencies as follows:

2.1.1 Use the Selective Signaling Telephone by depressing "*" (star) 1".

_____ 2.1.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:

- | | | |
|--------------------------|------------------------|----------------|
| <input type="checkbox"/> | A. Iredell County: | 9-704-878-3039 |
| <input type="checkbox"/> | B. Mecklenburg County: | 9-704-943-6200 |
| <input type="checkbox"/> | C. Gaston County: | 9-704-866-3300 |
| <input type="checkbox"/> | D. Lincoln County: | 9-704-735-8202 |
| <input type="checkbox"/> | E. Catawba County: | 9-828-464-3112 |
| <input type="checkbox"/> | F. NC EOC: | 9-919-733-3943 |
| <input type="checkbox"/> | G. Cabarrus County: | 9-704-920-3000 |

NOTE: State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.

_____ 2.1.3 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

NOTE: Notification time is the time the first agency is contacted.

2.2 Record Notification Time and date on Line 2.

2.3 Place a check mark by the state and counties listed on back of form as they come on line.

2.4 Advise the state and counties you have an emergency notification from the McGuire Control Room and to get out an Emergency Notification Form.

_____ 2.5 **IF** message is being transmitted on Selective Signaling, **GO TO** Step 2.7.

Enclosure 4.3
Completion and Transmission of a
Termination Message

RP/0/B/5700/029
Page 3 of 3

NOTE: Message authentication is only required if message transmittal is other than via Selective Signaling.

- _____ 2.6 **WHEN** you reach Line 2, perform the following:
 - 2.6.1 **REFER TO** Authentication Codeword List.
 - 2.6.2 Ask the State or a County to authenticate the message.
 - 2.6.3 You provide appropriate Codeword.
 - 2.6.4 Record the Number on Line 2.

- 2.7 Beginning with Line 1, slowly read the complete message line by line, allowing the receivers ample time to copy.

- 2.8 After communicating the message, ask if there are any questions.

- 2.9 Record individuals' names, date and times on the back of the form. (This time is the same time as Line 2.)

- _____ 2.10 **IF** unable to contact any agency, continuous attempts must be made to contact the missing agency (agencies).

- _____ 2.11 **WHEN** the missing agency is contacted, record the name, date and time the agency was contacted on the back of the form.

- 2.12 FAX a copy (front page only) to the agencies as follows:
 - 2.12.1 Insert the Emergency Notification Form face down in the FAX.
 - 2.12.2 Press "GROUP FAX" button.
 - 2.12.3 Press "SEND/RECEIVE" button.

- _____ 2.13 **IF** any programmed fax button fails **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX number.

Offsite Protective Action Recommendations

- NOTE:** 1. Protective Action Recommendations (PARs) for the public apply during a General Emergency, and include sheltering, evacuation and consideration of KI use. PARs are based on plant conditions independent of projected dose, and can also be based on projected dose. Protective Action Guides (PAGs) are levels of radiation dose at which prompt protective actions should be initiated and are based on EPA-400-R-92-001, Manual of protective Action Guides and Protective Actions for Nuclear Incidents. The projected dose PARs specified in this enclosure are based on the PAGs listed below. The PAG for KI is taken from Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies, FDA Guidance, November 2001 and Guidance for Industry, KI in Radiation Emergencies, Questions and Answers, FDA, December 2002. {23}

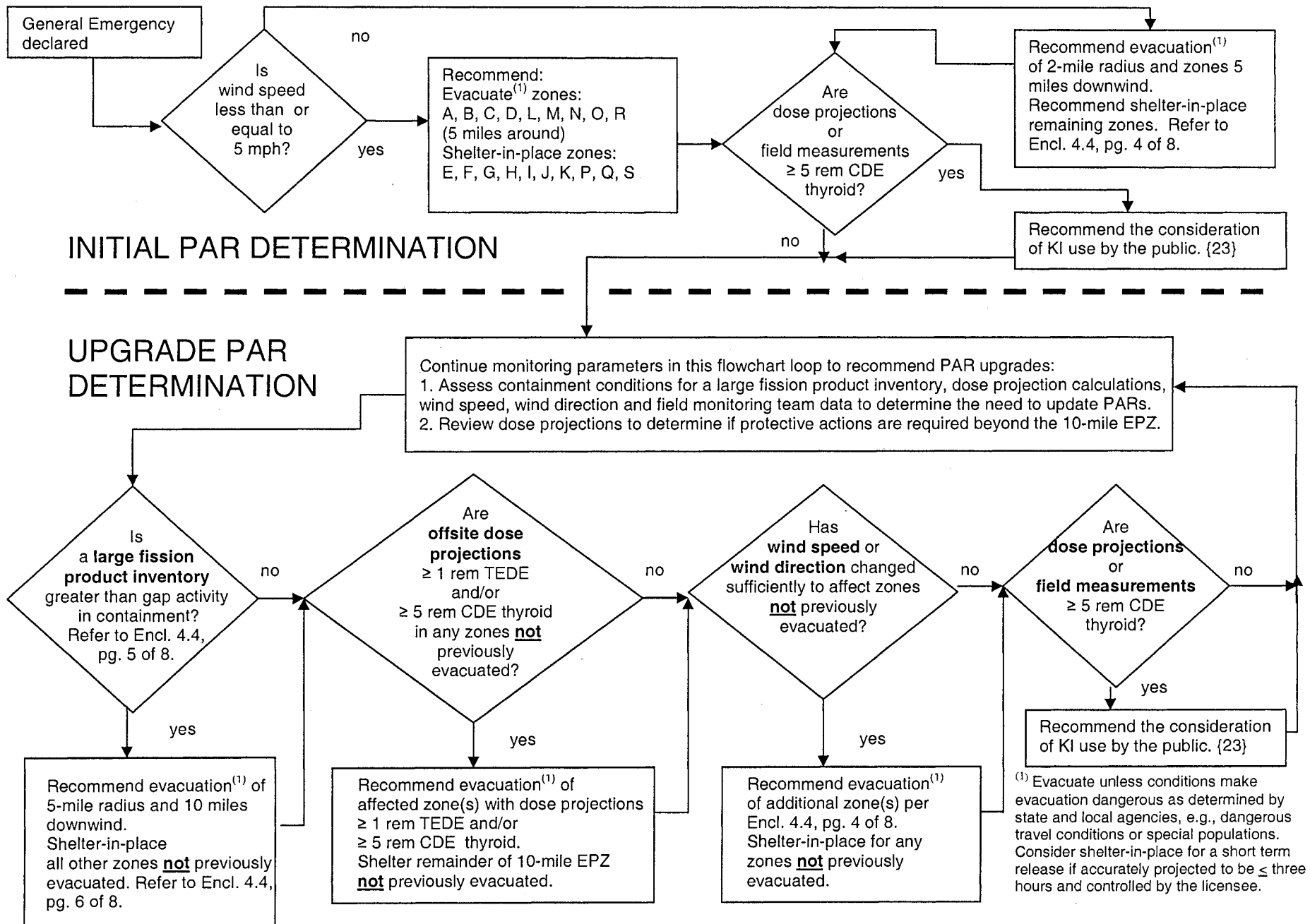
PROTECTIVE ACTION GUIDES (PAGs)

Projected Dose

Total Effective Dose Equivalent (TEDE)	Committed Dose Equivalent (CDE) Thyroid	Recommendation
< 1 rem	< 5 rem	No Protective Action is required based on projected dose.
≥ 1 rem	≥ 5 rem	Evacuate affected zones and shelter the remainder of the 10-mile EPZ not evacuated.
N/A	≥ 5 rem	Consider the use of KI (potassium iodide) in accordance with State Plans and Policy.

2. **IF** desired, you may refer to the flow chart of page 2 of this enclosure. {PIP M-06-5137, C.A.3}

Offsite Protective Action Recommendations



Offsite Protective Action Recommendations

_____ 1. **IF** a General Emergency is declared, determine Initial Protective Action Recommendations as follows (PIP-M-02-6163):

- 1.1 Obtain the wind speed and direction, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed) and point #8 (Average Upper Wind Direction).

Wind Direction (Point 8): _____

Wind Speed (Point 5): _____

_____ 1.2 **IF** Chart Recorder unavailable, obtain wind direction from one of the following sources, preferred sequence:

- A. Unit 1 OAC:

- Average Upper Wind Direction - M1P0847
- Average Lower Wind Speed - M1P0848.

- B. DPC Meteorologist (9-704-382-0139 or 9-704-373-7896).

- C. National Weather Service in Greer, S.C. (9-864-879-1085 or 9-800-268-7785).

_____ 2. **IF** wind speed less than or equal to 5 MPH, recommend the following:

CAUTION: 1. Once a zone is selected for evacuation, it should not be removed. {PIP-M-03-3483}

2. A short term release is any release that can be projected to be 3 hours or less in duration. An example would be a "puff release". A controlled release is one that can be started and stopped at the licensee's discretion, such as the venting of Containment for pressure control. **IF** a release is short term and controlled, **THEN** sheltering in lieu of evacuation should be considered. {PIP-M-05-3631}

- 2.1 Evacuate zones A, B, C, D, L, M, N, O, R. (See Caution 2 above)
- 2.2 Shelter zones E, F, G, H, I, J, K, P, Q, S.

3. **IF** wind speed is greater than 5 MPH, evacuate and shelter zones as shown in the table below based on wind direction:

CAUTION: 1. Once a zone is selected for evacuation, it should not be removed. {PIP-M-03-3483}
 2. A short term release is any release that can be projected to be 3 hours or less in duration. An example would be a "puff release". A controlled release is one that can be started and stopped at the licensee's discretion, such as the venting of Containment for pressure control. **IF** a release is short term and controlled, **THEN** sheltering in lieu of evacuation should be considered. {PIP-M-05-3631}

Protective Action Zones Determination

Wind Speed Greater than 5 Miles per Hour

Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	Evacuate* 2 Mile Radius-5 Mile Downwind	Shelter Remaining Sectors
0.1 - 22.5	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
22.6 - 45.0	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
45.1 - 67.5	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
67.6 - 90.0	B,C,D,L,M,N,O,R	A,E,F,G,H,I,J,K,P,Q,S
90.1 - 112.5	B,C,L,M,N,O,R	A,D,E,F,G,H,I,J,K,P,Q,S
112.6 - 135.0	A,B,C,L,M,N,O,R	D,E,F,G,H,I,J,K,P,Q,S
135.1 - 157.5	A,B,C,L,M,N,O	D,E,F,G,H,I,J,K,P,Q,R,S
157.6 - 180.0	A,B,C,L,M,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
180.1 - 202.5	A,B,C,L,M,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
202.6 - 225.0	A,B,C,D,L,M,N	E,F,G,H,I,J,K,O,P,Q,R,S
225.1 - 247.5	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
247.6 - 270.0	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
270.1 - 292.5	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
292.6 - 315.0	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
315.1 - 337.5	B,C,D,L,M,R	A,E,F,G,H,I,J,K,N,O,P,Q,S
337.6 - 360.0	B,C,D,L,M,R	A,E,F,G,H,I,J,K,N,O,P,Q,S

* See Cautions 1 and 2 above.

4. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy. {PIP-G-03-606}
5. For any other Protective Action Recommendation, check E (Other) and record information.

Offsite Protective Action Recommendations

6. After the Initial PARS are transmitted to offsite agencies, check for large fission product inventory in containment as follows:

6.1 **IF** the OAC is available, call up the following computer points based on need:

Unit 1 OAC	Unit 2 OAC
M1A0829	M2A0829
M1A0835	M2A0835.

6.2 **IF** the OAC is unavailable, use the following EMF's:

Unit 1	Unit 2
1EMF51A	2EMF51A
1EMF51B	2EMF51B.

- 6.3 Check if containment radiation level exceeds the following limits based on time after shutdown:

TIME AFTER SHUTDOWN (hours)	EMF51A(B) reading(R/HR)
>0-2	864
>2-4	624
>4-8	450
>8	265

Offsite Protective Action Recommendations

7. **IF** containment radiation level exceeds limits in Step 6.3, perform the following:

7.1 Evacuate and shelter zones in the table below based on wind direction:

CAUTION: 1. Once a zone is selected for evacuation, it should not be removed. {PIP-M-03-3483}

2. A short term release is any release that can be projected to be 3 hours or less in duration. An example would be a "puff release". A controlled release is one that can be started and stopped at the licensee's discretion, such as the venting of Containment for pressure control. **IF** a release is short term and controlled, **THEN** sheltering in lieu of evacuation should be considered. {PIP-M-05-3631}

Protective Action Zones Determination

For Containment Radiation Levels Exceeding GAP Activity

Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	Evacuate* 5 Mile Radius-10 Mile Downwind	Shelter Remaining Sectors
0.1 - 22.5	A,B,C,D,E,F,L,M,N,O,R,S	G,H,I,J,K,P,Q
22.6 - 45.0	A,B,C,D,E,L,M,N,O,Q,R,S	F,G,H,I,J,K,P
45.1 - 67.5	A,B,C,D,E,L,M,N,O,Q,R,S	F,G,H,I,J,K,P
67.6 - 90.0	A,B,C,D,L,M,N,O,P,Q,R,S	E,F,G,H,I,J,K
90.1 - 112.5	A,B,C,D,K,L,M,N,O,P,Q,R,S	E,F,G,H,I,J
112.6 - 135.0	A,B,C,D,I,K,L,M,N,O,P,Q,R,S	E,F,G,H,J
135.1 - 157.5	A,B,C,D,I,K,L,M,N,O,P,Q,R	E,F,G,H,J,S
157.6 - 180.0	A,B,C,D,I,J,K,L,M,N,O,P,R	E,F,G,H,Q,S
180.1 - 202.5	A,B,C,D,G,H,I,J,K,L,M,N,O,P,R	E,F,Q,S
202.6 - 225.0	A,B,C,D,G,H,I,J,K,L,M,N,O,P,R	E,F,Q,S
225.1 - 247.5	A,B,C,D,F,G,H,I,J,L,M,N,O,R	E,K,P,Q,S
247.6 - 270.0	A,B,C,D,F,G,H,I,J,L,M,N,O,R	E,K,P,Q,S
270.1 - 292.5	A,B,C,D,E,F,G,H,J,L,M,N,O,R	I,K,P,Q,S
292.6 - 315.0	A,B,C,D,E,F,G,L,M,N,O,R	H,I,J,K,P,Q,S
315.1 - 337.5	A,B,C,D,E,F,G,L,M,N,O,R	H,I,J,K,P,Q,S
337.6 - 360.0	A,B,C,D,E,F,L,M,N,O,R,S	G,H,I,J,K,P,Q

* See Cautions 1 and 2 above.

Offsite Protective Action Recommendations

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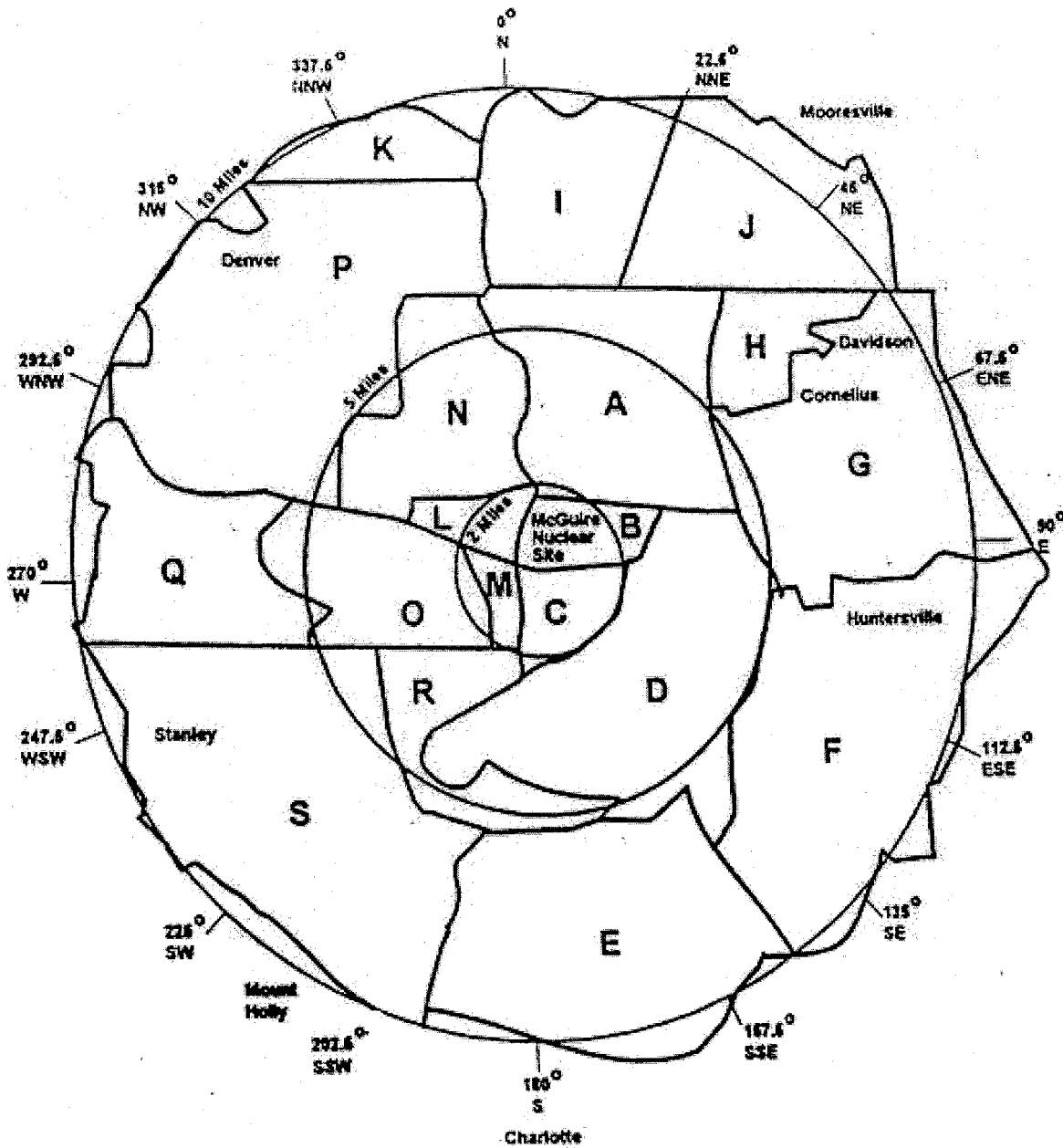
- 7 8. A McGuire EPZ map is located on page 8 of 8, if it is desired to visually see zones evacuated or sheltered.
- _____ 9. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy. {PIP-G-03-606}
- _____ 10. On a continuing basis, evaluate specific plant conditions including: large fission product inventory in containment, EMF 51 A/B readings, offsite dose projections, wind speed and wind direction, field monitoring team data, and assess the need to update Protective Action Recommendations made to the states and counties in the previous notification.
- _____ 11. Review dose projections with the on-shift dose assessor (if available) to determine if Protective Action Recommendations are required beyond the 10-mile EPZ.
- _____ 12. **IF** Protective Action Recommendations are required beyond 10 miles, notify the states and counties and request that they consider sheltering/evacuating the general populations located beyond the affected 10-mile EPZ.

Offsite Protective Action Recommendations

McGUIRE PROTECTIVE ACTION ZONES

(2 and 5 mile radius, inner circles)

10-MILE EPZ



**Enclosure 4.5
NRC Event Notification Worksheet**

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Page 1 of 2

STATE: "THIS IS THE MCGUIRE NUCLEAR SITE IN NRC REGION 2 MAKING AN EVENT NOTIFICATION REPORT"

NOTIFICATION /DATE	UNIT	CALLER'S NAME	CALLBACK TELEPHONE #: ENS 1-888-270-0173 or (704) - 875-6044	NRC OPERATIONS OFFICER CONTACTED
--------------------	------	---------------	--	----------------------------------

EVENT TIME & ZONE (time) Region II (zone)	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER
--	------------	-------------------	------------------

EVENT CLASSIFICATIONS
GENERAL EMERGENCY
SITE AREA EMERGENCY
ALERT
UNUSUAL EVENT
TRANSPORTATION (10 CFR 20)
MATERIAL/EXPOSURE (10 CFR 20)
OTHER

1-Hr Non-Emergency
(50.72 b1(a)) TS Deviation
(70.52) (a) and (b) Accidental Criticality OR
(72.74) (a) Loss or theft of SNM

4-Hr Non-Emergency
(50.72 b2 (I)) TS Required S/D
(50.72 b2 (IV)(A)) ECCS Discharge to RCS
(50.72 b2 (IV)(B)) RPS Actuation - critical scram
(50.72 b2 (XI)) Offsite Notification
(72.75)(b1) Deviation from ISFSI T.S.
[70.50(a)] SNM Protective action(s)
PHYSICAL SECURITY (73.71)

8-Hr Non-Emergency 10CFR 50.72(b)3
(72.75)(c1) Spent Fuel Storage SSC defect.
(72.75)(c2) Spent Fuel Storage degradation.
(72.75)(c3) Fuel Storage related offsite medical.
(50.72 b3 (XII)) Offsite Medical
(50.72 b3 (II)(A)) Degraded Condition
(50.72 b3 (II)(B)) Unanalyzed Condition
(50.72 b3 (IV)(A)) Valid Actuation of System listed in Encl. 4.3.
(50.72 b3 (V)(A)) Safe S/D Capability
(50.72 b3 (V)(B)) RHR Capability
(50.72 b3 (V)(C)) Control of Rad Release
(50.72 b3 (V)(D)) Accident Mitigation
(50.72 b3 (X)(III)) Lost ENS
(50.72 b3 (X)(III)) Lost Other Assess./Comms
(50.72 b3 (X)(III)) Emergency Siren INOP

24-Hr. Non-Emergency
Material/Exposure (10CFR20)
(72.75)(d1) Fuel Storage equipment failure.
(73 App G) safeguards vulnerabilities
26.73 Significant events involving fitness for duty.
(70.50(b1)) Contamination event restrictions.
(70.50(b2)) Equipment failure
(70.50(b3)) Unplanned medical treatment
(70.50(b4)) Fire/explosion damage to licensed material
ISFI Certificate of Compliance

EVENT DESCRIPTION

Include: Systems affected, actuation's & their initiating signals, causes, effect of event on plant, actions taken or planned, etc.

Continue on Enclosure 4.5 page 2 of 2 if necessary.

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD? <input type="checkbox"/> YES <input type="checkbox"/> NO
NRC RESIDENT				(Explain above)
STATE(s)				DID ALL SYSTEMS FUNCTION AS REQUIRED YES <input type="checkbox"/> <input type="checkbox"/> NO
LOCAL				(Explain above)
OTHER GOV AGENCIES				MODE OF OPERATION EST. ADDITIONAL INFO ON BACK RESTART
MEDIA/PRESS RELEASE				UNTIL CORRECTED DATE: <input type="checkbox"/> YES <input type="checkbox"/> NO

APPROVED BY: _____ TIME/DATE: _____ / _____ / _____
Operations Shift Manger/Emergency Coordinator Eastern mm dd yy

**Enclosure 4.5
NRC Event Notification Worksheet**

RP/0/B/5700/029
Page 2 of 2

LOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)						
LIQUID RELEASE	GASEOUS RELEASE	UNPLANNED RELEASE	PLANNED RELEASE	ONGOING	TERMINATED	
MONITORED	UNMONITORED	OFFSITE RELEASE	T.S. EXCEEDED	RM ALARMS	AREAS EVACUATED	
PERSONNEL EXPOSED OR CONTAMINATED		OFFSITE PROTECTIVE ACTIONS RECOMMENDED		State release path in description		

NOTE: Contact Radiation Protection Shift to obtain the following information.

IF the notification is due and the information is not available,
THEN mark "Not Available" and complete the notification.

	Release Rate (Ci/sec)	% T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid (excluding tritium & dissolved noble gases)			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

RECORD MONITORS IN ALARM	PLANT STACK (EMF 35, 36, 37)	CONDENSER/AIR EJECTOR (EMF 33)	MAIN STEAM LINE (UNIT 1-EMF 24,25,26,27 UNIT 2-EMF 10, 11, 12,13)	SG BLOWDOWN (EMF 34)	OTHER
RAD MONITOR READINGS:					
ALARM SETPOINTS: TRIP II					
% T.S. LIMIT (If applicable)		NOT APPLICABLE		NOT APPLICABLE	

R SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

LOCATION OF THE LEAK (e.g. SG#, valve, pipe, etc.):					
LEAK RATE: gpm/gpd		T.S. LIMITS EXCEEDED:		SUDDEN OR LONG TERM DEVELOPMENT:	
LEAK START DATE:		TIME:		COOLANT ACTIVITY:	
				PRIMARY SECONDARY	
				(Last Sample) Xe eq. _____ mCi/ml Xe eq. _____ mCi/ml	
				Iodine eq. _____ mCi/ml Iodine eq. _____ mCi/ml	

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION (Continued from Enclosure 4.5 Page 1 of 2)

Enclosure 4.6
County Emergency Response Radio
CPI Remote Instructions

RP/0/B/5700/029

Page 1 of 1

- When to Use:** To contact the county Warning Point(s) (WP) when the Selective Signaling Network and Bell system are out of service and during monthly or other scheduled radio checkouts with the desired locations.
- Volume Control:** Adjusts the volume of the speaker and also adjusts the volume of the "beep tone", which indicates incoming call.
- Keypad:** Used to enter code to call the Individual County WP or group call to all County WPs.

<u>County</u>	<u>Encoder Tone</u>
Mecklenburg	21*
Gaston	26*
Lincoln	25*
Iredell	23*
Catawba	27*
Cabarrus	28*
Group Call for all Counties	20*

Making a Call

NOTE: Before each voice transmission, depress the PTT (push-to-talk) bar on handset for one second and then begin to speak. Transmit (TX) light on bottom of the remote face will be on when PTT bar is depressed. To listen, release the PTT bar.

1. Lift the hand set.
2. Enter the desired 2-digit county code (or 20 for group call) and press the * key.
3. After hearing the activate tone (~3 sec.), depress the PTT bar and begin to speak. Await a response from the called party or parties.
4. If desired, use Duke Energy radio code signals in your transmissions.
5. After the call is complete, sign off by identifying your station (WQC700) as clear.
6. Return radio to the ready state by the following: replace the handset; set the volume at mid scale so the beep tone can be heard.

Answering a Call

1. If a new incoming call is received, a beep tone pulse will be heard and the transmit (TX) light will blink. (TX light is on bottom of remote face.)
2. Lift the handset and depress the PTT bar.
3. Wait approximately one second and speak to answer the call
4. To listen, release the PTT bar.
5. After the call is complete, sign off by identifying your station (WQC700) as clear.
6. Return radio to the ready state by the following: replace the handset; set the volume at mid scale so the beep tone can be heard.

Facility:	McGuire	Date of Examination:	5/12/08
Exam Level (circle one):	<i>RO (only)</i> / SRO(I) / SRO (U)	Operating Test No.:	N08-1
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.	001 Control Rod Drive System Retrieve a Dropped Control Rod	S, D	1
b.	EPE 038 Steam Generator Tube Rupture NC Cooldown During SGTR	S, N, A	3
c.	003 Reactor Coolant Pump System Start "1B" Reactor Coolant Pump	S, M, A	4P
d.	061 Auxiliary/Emergency Feedwater System Operate the Turbine Driven CA Pump from the Control Room	S, M	4S
e.	026 Containment Spray System Manually Actuate Containment Spray System	S, N, A, EN	5
f.	APE 036 Fuel Handling Incidents Start Outside Air Pressure Filter Fan Following Damage of Spent Fuel Assembly	S, M	8
g.	015 Nuclear Instrumentation System Respond to a Source Range Nuclear Instrumentation Failure	S, D, A, L	7
h.	062 AC Electrical Distribution System Restoration of Power to Unit 1 6900V Buses using Offsite Power	S, M	6
In-Plant Systems [®] (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
i.	004 Chemical and Volume Control System Emergency Borate the Reactor Coolant System Locally Using 2NV-269	D, R, E	1
j.	APE 065 Loss of Instrument Air Ensure Proper Response of Diesel VI Compressors on Loss of VI	D, A, E	8
k.	EPE 055 Station Blackout Establish NC Pump Seal Injection from the SSF	D, E	6

@ 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)lternate path	4-6 (5) / 4-6 (5) / 2-3 (3)
(C)ontrol room	
(D)irect from bank	≤ 8 (5) / ≤ 8 (5) / ≤ 4 (3)
(E)mergency or abnormal in-plant	≥ 1 (3) / ≥ 1 (3) / ≥ 1 (2)
(EN)gineered Safety Feature	- / - / ≥ 1 (1) (Control Room System)
(L)ow-Power / Shutdown	≥ 1 (1) / ≥ 1 (1) / ≥ 1 (1)
(N)ew or (M)odified from bank including 1(A)	≥ 2 (6) / ≥ 2 (5) / ≥ 1 (2)
(P)revious 2 exams	≤ 3 (0) / ≤ 3 (0) / ≤ 2 (0) (Randomly Selected)
(R)CA	≥ 1 (1) / ≥ 1 (1) / ≥ 1 (1)
(S)imulator	

JPM Summary

- JPM A This is Bank JPM-IC-IRE:009. The Operator will be placed in a situation with Unit 1 at 55% power, and Control Rod H-8 dropped into the core. The operator will be told that the unit is conditioned for 100% power, the rod has been dropped 15 minutes, and that IAE has repaired the cause of the dropped rod. The operator will be required to recover Rod H-8 and align it to within ± 4 steps of Control Bank 'D's indicated position using Enclosure 1 of AP/1/A/5500/14 (Rod Control Malfunction). This JPM will be performed in conjunction with JPM F on the Simulator.
- JPM B This is a New JPM. The Operator will be placed in a SGTR situation at Unit 1 with actions through EP/1/A/5000/E-3 complete through Step 10.a. The operator will be asked to cooldown the NC System to 520°F starting with Step 10.b of EP/1/A/5000/E-3, Steam Generator Tube Rupture. During the cooldown, the operator will discover that the Steam Dump valves will NOT open, rendering this an Alternate Path JPM. The operator will need to abandon the use of the Steam Dump System for cooldown, and use the SG PORVs on the intact Steam Generators.
- JPM C This is a modified JPM using Bank JPM-PS-NCP:027 as its basis. The Operator will be placed in a post-reactor trip situation with Unit 1 in Natural Circulation. The operator will be told that initial conditions for the start-up of all NCPs are satisfied, all R&R's have been evaluated, all valve checklists are complete, and that Seal Injection flow and KC flow to the Thermal Barrier have been maintained to all NCPs throughout the event. The operator will be asked to start the 1B NC Pump in accordance with Section 3.5 of Enclosure 4.1 of OP/1/A/6150/002A, "Reactor Coolant Pump Operation." During the performance of this procedure the 1B NCP Standpipe low level alarm will alarm rendering this JPM an Alternate Path JPM. The operator will be required to adjust level of the standpipe as part of the pump start procedure in accordance with Enclosure 4.3, "Filling and Draining NC Pump Standpipe," of OP/1/A/6150/002A, "Reactor Coolant Pump Operation." The modification of the Bank JPM involved the Standpipe alarm.
- JPM D This is a modified JPM using Bank JPM-CF-CA:059 as its basis. The Operator will be placed in a 100% power steady-state condition on Unit 1. The operator will be told that Maintenance has requested Operations to run the #1 TD CA Pump to allow them to check vibration, and that a normal start of the TD CA Pump is desired. The operator will be asked to start the TD CA Pump per OP/1/A/6250/002 Enclosure 4.4 (Manual Operation of #1 TD CA Pump) and run it in recirc for 10 minutes. The modification includes the deletion of the portion of the JPM requiring shutdown of the pump.
- JPM E This is a New JPM. The operator will be placed in a Post-Reactor Trip situation and told that the crew has progressed from E-0 to ES-0.1 due to a reactor trip. The operator will be told that after entry into ES-0.1 a large steam line rupture occurs on the A Steam Generator inside Containment causing a Safety Injection. The crew has now left ES-0.1 for FR-Z.1 due to the Orange Path condition on the Containment Critical Safety Function and completed steps 1-9. The operator will be asked to check the NS System in Operation in accordance with step 10 of FR-Z.1, Response to High Containment Pressure. Although Containment Pressure will be > 3 psig, automatic actuation of Containment Spray (NS) will fail. Additionally, the NS manual actuators will fail to operate requiring that the operator take manual action to start the NS Pumps and open the discharge valves. The failure of the automatic actions will render this JPM an

Alternate Path JPM. The operator will need to manually open the NS Pump discharge valves and manually start the NS Pumps. When attempts are made to manually open the A Train discharge valves, they will not open, requiring the operator to make no attempt to start the 1A NS pump.

JPM F This is a modified JPM using Bank JPM-PSS-VC:247T as its basis. The Operator will be placed in Mode 1 situation on Unit 1 with a reported Spent Fuel handling incident, which occurred 20 minutes ago, in progress. The operator will be told that gas bubbles are coming from the dropped fuel assembly and 1EMF-42, FUEL BLDG VENT HI RAD is in Trip 2; and that the unit is presently implementing AP/1/A/5500/25, "Spent Fuel Damage." The operator will be asked to place one Outside Air Pressure Filter train in service per Enclosure 1, "Control Room Pressurization," of AP/1/A/5500/25, "Spent Fuel Damage." This is a Time Critical Task (10 minutes) as identified in PT/0/A/4600/113, "Operator Time Critical Task Verification," Enclosure 13.26, "Start OAPRT Following Spent Fuel Assembly Damage Anywhere On Site." The modification includes the readjustment of the Time Critical portion of the JPM to 10 minutes rather than 15 minutes.

JPM G This is Bank JPM-IC-ENB:187A. The Operator will be placed in a Reactor Startup situation at Unit 1 when one of two Source Range Instruments fail low. The operator will be told that the unit is presently in Mode 2. The operator will be asked to remove the failed SR channel (N-31) from service by performing AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case I, "Source Range Malfunctions." During the performance of this procedure, the second Source Range Channel (N32) will also fail, without a corresponding Reactor Trip rendering this an Alternate Path JPM. The operator will address the Annunciator Response Procedure associated with the First Out Annunciator Panel alarm, OP/1/A/6100/010A, ARP1FO1/A-6, "S/R HI Flux Rx Trip," manually trip the reactor, and perform the associated reactor trip immediate actions in accordance with EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."

JPM H This is a modified JPM using Bank JPM-EL-EP:042 as its basis. The Operator will be placed in a situation where a loss of all AC power has occurred on both Units 1 and 2. The operator will be told that EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented and completed through subsequent step 16 without restoring power to the unit. The operator will be asked to restore power to the Unit 1 6900 Volt Buses using Offsite Power per EP/1/A/5000/ECA-0.0 Enclosure 8. The modification of the Bank JPM involved eliminating a portion of the JPM which subsequently re-energizes the 4160 Volt Emergency Buses. Since last used the procedure has been updated and expanded requiring that the task of restoring power to the Emergency Buses from offsite be subdivided into two tasks; restoring the 6900 V Buses from offsite power, and restoring the 4160 V buses with power to the 6900 V buses restored.

JPM I This is Bank JPM-PS-NV:184T. The Operator will be placed in a situation with Unit 2 at 100% power, when a Dilution Event occurs. The operator will be told that 2NV-265B (Boric Acid To NV Pumps) was discovered to be de-energized. The operator will be required to manually attempt to operate 2NV-265B locally, and operate an alternative valve when it is discovered that the valve cannot be manually opened. This is a Time Critical Task as identified in PT/0/A/4600/113, "Operator Time Critical Task Verification," Enclosure 13.4, "Stop Dilution and Borate During a Dilution Event."

JPM J This is Bank JPM-SS-VI:164A. The Operator will be placed in a situation with both Units at 100% power when a leak develops in the VI system. The operator will be told that AP/1/A/5500/22, "Loss of VI," has been implemented up to step 4.c, and that VI header pressure is 75 PSIG and going down. The operator will be asked to ensure that Diesel VI compressors are running per Enclosure 4 (Diesel VI Compressor Operation) of AP/1/A/5500/22. During the performance of this Enclosure, the G VI Diesel Air Compressor will fail to start the first time that a manual start is attempted, rendering this an Alternate Path JPM. The operator will need to take action to in accordance with the Enclosure and re-start the G VI Diesel Air Compressor.

JPM K This is Bank JPM-CP-AD:061T. The Operator will be placed in a situation in which a Loss of All AC has occurred on Unit 1. The operator will be told that EP/1/A/5000/ECA-0.0, "Loss of All AC Power" has been implemented, and that one operator has been dispatched to 1ETA to swap 1EMXA4. The operator will be asked to obtain the Brown Folder at SSF and complete Enclosure 1, "Unit 1 SSF-ECA-0.0 Actions," which will require the re-establishment of NCP Seal Water flow. The re-establishment of NCP Seal Water flow is a Time Critical Task as identified in PT/0/A/4600/113, "Operator Time Critical Task Verification," Enclosure 13.11, "Initiate SSF NCP Seal Injection and Swap to the SSF."

SIM JPM A

To be run in conjunction with JPM F

Facility: McGuire Task No.:

Task Title: Retrieve a Dropped Control Rod JPM No.: 2008 Systems - Control Room JPM A

K/A Reference: 001 K4.09 3.9 / 4.1

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- The unit is operating at 55% power with $T_{Avg} = T_{REF}$.
 - Control Rod H-8 in "D" Control Bank has dropped to the bottom of the core.
 - The unit is conditioned for 100% power and the rod has been dropped 15 minutes.
 - AP/1/A/5500/14 (Rod Control Malfunction) has been implemented and completed through step 13 of Enclosure 1 (Response to a Dropped Control Rod).
 - IAE has repaired the cause of the dropped rod.

Task Standard: Rod H-8 is recovered and aligned to within ± 4 steps of Control Bank 'D's indicated position. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: AP/1/A/5500/14, Rod Control Malfunction

Handouts: AP/1/A/5500/14, Enclosure 1

Initiating Cue: The CRSRO has directed you to complete Enclosure 1 of AP/1/A/5500/14 (Rod Control Malfunction), beginning at step 14.

Time Critical Task: NO

Validation Time: 12 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-34, 55% Power MOL
2. Place in RUN and allow time to stabilize
3. Insert Malfunction IRE006H8, Dropped Rod H-8, value Stationary Gripper
4. Perform the actions of AP/1/A/5500/14 up through subsequent step 13 of Enclosure 1.
5. Stabilize the plant
6. Clear MAL IRE006H8
7. Reset "Rod Control Alarm Reset." Ensure 1AD-2, Annunciator A-10 goes dark.
8. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-115 (May 2008).

NOTE: During the performance of the JPM, the Simulator Driver will be required to:

- Acknowledge spurious alarms unrelated to the task being performed.
- Borate during the recovery of the dropped rod such that Tavg is maintained constant (Step 22 of Enclosure 1 of AP/1/A/5500/14). See Note prior to JPM Step 13.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/14, Enclosure 1 marked up for placekeeping through step 13.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(Step 14) Record the following in the Reactor Operator Logbook:</p> <p>(Step 14.a) Record step counter readings for the affected rod group</p> <p>(Step 14.b) Check affected rod location - IN CONTROL BANK</p> <p>(Step 14.c) Dispatch IAE to obtain Bank Overlap Display in Logic Cabinet (Rod Control Cabinets approximately 5 ft from floor)</p> <p>(Step 14.d) Record bank overlap display.</p>	<p>Operator observes Control Bank D Group 2 Step Counter and records "158."</p> <p>Operator observes DRPI and verifies Control Rod H-8 is in Control Bank.</p> <p>Operator dispatches IAE.</p> <p>Cue:</p> <p>IAE reports a Bank Overlap Counter reading of 475</p> <p>Operator records Bank Overlap Counter reading of 475.</p>		
*2	<p>(Step 15) Open coil disconnect switches on all lift coils in affected bank except for dropped rod</p>	<p>Operator moves Coil Disconnect Switches for Control Rods D-4, D-12, M-4, and M-12 to the "UP" position.</p>		
3	<p>(Caution prior to Step 15) Failure to pause between each bank selected may result in dropping rods.</p>	<p>Operator reads caution.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 16) Transfer rod control from manual to affected bank using "CRD BANK SELECTOR"	Operator rotates CRD Bank Selector Switch to "CBD" position.		
5	(Step 17) Check "ROD CONTROL URGENT FAILURE" alarm (1AD-2, A-10) – DARK	Operator observes alarm is dark.		
6	(Step 18) Check DRPI indication for dropped rod: AT ZERO STEPS <u>OR</u> AT SIX STEPS	Operator determines DRPI indicates Rod H-8 is at ZERO (0) STEPS.		
7	(Note prior to Step 19) The "ROD CONTROL URGENT FAILURE" (1AD, A-10) alarm will not occur if the rod is in Shutdown Bank C, D, or E.	Operator recognizes that since the dropped rod is in the Control Bank, the "ROD CONTROL URGENT FAILURE" (1AD, A-10) alarm will occur, and is expected.		
8	(Step 19) WHEN "ROD CONTROL URGENT FAILURE" (1AD-2, A-10) alarm occurs in the next step, THEN acknowledge alarm and continue rod insertion in the "BANK SELECT" position.	Operator reads Step.		
9	(Note prior to Step 20) The demand counter for the group being moved will be the only counter to change.	Operator reads Note.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(Step 20) Push rod control "IN" approximately 10 steps on step counter while ensuring all unaffected rods do not move	<p>Operator takes IN/HOLD/OUT lever to "IN."</p> <p>Operator observes DRPI for unaffected Control Rods (M-4, M-12, D-4 and D-12) and verifies that they do not move.</p> <p>Operator recognizes that "ROD CONTROL URGENT FAILURE" alarm is illuminated and depresses the acknowledge pushbutton.</p> <p>After approximately 10 (\approx148) steps on Control Bank D Group 2 Step Counter, the operator releases the IN/HOLD/OUT lever to "HOLD."</p>		
*11	(Step 21) Place affected rod group demand step counter to zero	<p>Operator opens Control Bank D Group 2 Step Counter Door.</p> <p>Operator depresses "RS" pushbutton, OR Operator depresses "DN" pushbutton until the digital display reads "000."</p>		
12	(Step 22) Adjust boron concentration to maintain constant T-ave during rod withdrawal in next step.	<p>Operator reads Step.</p> <p>Cue:</p> <p>Another operator will adjust Boron concentration to maintain T-ave constant.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
<p>NOTE: Simulator Instructor Borate 150 gallons of Boron through 1NV-265B (Boric Acid to NV Pumps) (Valve open for 100 seconds).</p>				
*13	(Step 23) Withdraw dropped rod to its recorded bank position	<p>Operator takes IN/HOLD/OUT lever to "OUT."</p> <p>Operator observes Control Bank D Group 2 Step Counter, DRPI and Tave-Tref mismatch.</p> <p>When Control Bank D Group 2 Step Counter is at "158" Steps, the operator releases the IN/HOLD/OUT lever to "HOLD."</p>		
*14	(Step 24) WHEN dropped rod is realigned with step counter reading, THEN reconnect de-energized lift coils	<p>Operator moves Coil Disconnect Switches for Control Rods D-4, D-12, M-4, and M-12 to the "DOWN" position.</p> <p>Cue:</p> <p>Another operator will complete the remainder of this procedure.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The unit is operating at 55% power with $T_{AVG} = T_{REF}$.
- Control Rod H-8 in "D" Control Bank has dropped to the bottom of the core.
- The unit is conditioned for 100% power and the rod has been dropped 15 minutes.
- AP/1/A/5500/14 (Rod Control Malfunction) has been implemented and completed through step 13 of Enclosure 1 (Response to a Dropped Control Rod).
- IAE has repaired the cause of the dropped rod.

INITIATING CUE:

The CRSRO has directed you to complete Enclosure 1 of AP/1/A/5500/14 (Rod Control Malfunction), beginning at step 14.

SIM JPM B

Facility: McGuire Task No.:

Task Title: NC Cooldown During SGTR JPM No.: 2008 Systems –
Control Room JPM B
(A)

K/A Reference: EPE 038 EA1.16 4.4/4.3

Examinee: Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A SGTR has occurred in the D Steam Generator.
- EP/1/A/5000/E-3 has been completed through Step 9.
- The D Steam Generator has been isolated.
- All NC Pumps are running.

Task Standard: Complete an NC System cooldown to target temperature. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: EP/1/A/5000/E-0, Reactor Trip or Safety Injection
EP/1/A/5000/E-3, Steam Generator Tube Rupture

Handouts: EP/1/A/5000/E-3, Steam Generator Tube Rupture

Initiating Cue: The CRSRO has directed you to cooldown the NC System to 520°F starting with Step 10.b of EP/1/A/5000/E-3, Steam Generator Tube Rupture.

Time Critical Task: NO

Validation Time: 20 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset the Simulator to IC-39 100% MOL
2. Insert Malfunction SG001D, SGTR on D SG (430 gpm).
3. Insert Malfunction OVR-SB002B = 100, and OVR-SB002D, All Steam Dump Valves fail to Open.
4. Perform EP/1/A/5000/E-0 and transition to E-3 at Step 21 RNO.
5. Perform EP/1/A/5000/E-3 and complete actions through Step 10.a.
6. Determine target NC System Temperature and ensure Initiating Cue reflects this temperature.
7. Throttle CA flow to each Steam Generator as necessary to maintain SG levels between 11-50%.
8. Freeze Simulator

OR

1. Reset the Simulator to IC-126 (May 2008)

NOTE: During the performance of the JPM, the Simulator Floor Operator will be required to:

- Acknowledge spurious alarms unrelated to the task being performed.
- Operate the PORV or Sprays to maintain NC System Pressure < 1955 psig AFTER the Operator has done the initial depressurization.
- Throttle CA flow to maintain SG Levels.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/E-3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 10.b) Check condenser available: "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) - LIT MSIV on intact S/G(s) - OPEN.	Operator observes C-9 status light LIT. Operator observes Red status light LIT for 1SM-1, 1SM-3 and 1SM-5.		
2	(Step 10.c) Check S/Gs 1B and 1C - INTACT.	Operator proceeds to Step 10.d. Cue: Both SGs 1B and 1C are intact.		
3	(Step 10.d) Perform the following to place steam dumps in steam pressure mode: Place "STM PRESS CONTROLLER" in manual. Adjust "STM PRESS CONTROLLER" output to equal "STEAM DUMP DEMAND" signal. Place "STEAM DUMP SELECT" in steam pressure mode.	Operator presses amber pushbutton on controller and observes that amber light is LIT. Operator observes that steam dump demand on 1SMP-5202 and controller output are equal. Operator rotates Steam Dump Select Switch clockwise to "STEAM PRESSURE."		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 10.e) WHEN "P-12 LO-LO TAVG" status light (1SI-18) lit, THEN place steam dumps in bypass interlock.	Operator observes P-12 status light NOT LIT, and recognizes continuous action.		
5	(Step 10.f) Dump steam from intact S/G(s) to condenser at maximum rate while attempting to avoid a Main Steam Isolation.	<p>Operator presses Red pushbutton on controller and recognizes that output does NOT change.</p> <p>Operator observes that Green status lights on Steam Dump Valves remain lit, and that Red status lights do NOT light.</p> <p>Operator recognizes that Steam Dump Valves are not opening and proceeds to the RNO (Alternate Path).</p>		
6	<p>(Step 10.f RNO 1) Perform the following:</p> <p>Ensure at least one Pzr PORV isolation valve is open.</p>	Operator observes that control switches are in the OPEN position for 1NC-31B, 1NC-35B and 1NC-33A, and that Red status lights are LIT.		
7	(Step 10.f RNO 2) IF VI is lost, OR a Phase B Isolation has occurred, THEN	<p>Operator observes 0VIP-5090 and recognizes that VI pressure is 100-110 psig. (VI is NOT lost).</p> <p>Operator observes Yellow Reset lights LIT for both Train A and Train B Containment Phase B Isolation (No Phase B isolation).</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	(Step 10.f RNO 3) IF Pzr pressure is greater than 1955 PSIG, THEN depressurize to 1900 PSIG using Pzr PORV.	<p>Operator observes Pzr Pressure channels and recognizes that NC pressure is 2000 psig.</p> <p>Operator opens one Pzr PORV by rotating Control Switch clockwise to OPEN.</p> <p>Operator observes Pzr Pressure < 1900 psig.</p> <p>Operator closes the opened Pzr PORV by rotating Control Switch counter-clockwise to AUTO.</p> <p>Cue:</p> <p>Another operator will ensure NC Pressure does not rise > 1955 psig.</p>		
SIMULATOR FLOOR INSTRUCTOR: Maintain Pzr Pressure < 1955 psig by opening one Pzr PORV pressure to Pzr Pressure reaching 1955 psig, and placing the Control Switch in AUTO when Pzr Pressure drops to 1900 psig.				
*9	(Step 10.f RNO 4) Depress "BLOCK" on Low Pressure Steamline Isolation block switches.	Operator depresses BLOCK on Train A and Train B Low Pressure Steamline Isolation Block Switches, and observes Green block light is LIT.		
10	(Step 10.f RNO 5) Maintain NC pressure less than 1955 PSIG.	<p>Operator checks NC pressure < 1955 psig.</p> <p>Cue:</p> <p>Another operator will ensure NC Pressure does not rise > 1955 psig.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 10.f RNO 6) Ensure Main Steam Isolation reset.	Operator observes Yellow Reset lights LIT for Train A and Train B Main Steam Isolation.		
12	(Step 10.f RNO 7) Ensure SM PORVs reset.	Operator observes Yellow lights LIT for Train A and Train B SM PORVs Reset.		
13	(Step 10.f RNO 8) IF any intact S/G SM PORV isolation valve is closed, AND associated SM PORV is operable, THEN	Operator observes Red status lights lit for 1SV-26, 1SV-27, and 1SV-28, and determines that valves are open.		
14	(Step 10.f RNO 9) IF 1B OR 1C S/G is ruptured, THEN	Operator proceeds to Step 10.f RNO 10.		
*15	(Step 10.f RNO 10.a) Dump steam using all intact S/G(s) SM PORVs at maximum rate as follows: Close SM PORV manual loader on ruptured S/G(s).	Operator rotates White Knob for 1SV-1AB counter-clockwise until Red needle at "0."		
16	(Step 10.f RNO 10.b) Place intact S/G SM PORV manual loaders at 50%.	Operator rotates White Knob for 1SV-7AB, 1SV-13AB and 1SV-19AB counter-clockwise until Red needle at "50."		
*17	(Step 10.f RNO 10.c) Select "MANUAL" on "SM PORV MODE SELECT".	Operator rotates SM PORV Mode Select Switch clockwise to MANUAL. Operator observes 1SV-7AB, 1SV-13AB and 1SV-19AB open to 50%.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*18	(Step 10.f RNO 10.d) Adjust manual loaders on intact S/G SM PORVs as required to control intact S/G depressurization rate at approximately 2 PSIG per second.	Operator adjusts White Knob on manual loaders for 1SV-7AB, 1SV-13AB and 1SV-19AB to establish depressurization rate. Operator monitors depressurization rate on OAC, or other equivalent means.		
19	(Step 10.f RNO 11) IF any intact S/G SM PORV closed, THEN....	Operator observes that all SM PORVs are OPEN by observing that both Red and Green status lights are LIT. NOTE: It is expected that the SG PORVS will go full OPEN (Green Status lights OFF).		
20	(Step 10.f RNO 12) IF no intact S/G available, THEN.....	Operator recognizes that there are three available intact Steam Generators and proceeds to Step 10.g.		
21	(Step 10.g) Check Low Pressure Steamline Isolation - BLOCKED.	Operator observes Green block light is LIT on Train A and Train B Low Pressure Steamline Isolation.		
22	(Step 10.h) Check Core exit T/Cs - LESS THAN REQUIRED TEMPERATURE.	Operator observes CETs on ICCM or OAC to be > 520°F.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	<p>(Step 10.i or 10.h RNO) Perform the following:</p> <p>WHEN Core exit T/Cs are less than required temperature, THEN:</p> <p>Stop NC System cooldown.</p> <p>Maintain core exit T/Cs less than required temperature.</p>	<p>Operator recognizes the continuous action nature of procedure step.</p> <p>Cue:</p> <p>Another operator will continue on with Step 11.</p> <p>Remain focused on the completion of the cooldown task.</p> <p>Operator observes CETs on ICCM or OAC to be < 520°F.</p> <p>Operator Closes or throttles the SM PORVs by rotating the White Knob on the manual loaders for 1SV-7AB, 1SV-13AB and 1SV-19AB.</p> <p>If Closed, operator observes the Green Status light LIT for 1SV-7AB, 1SV-13AB and 1SV-19AB.</p> <p>Cue:</p> <p>Another operator will complete the remainder of this procedure.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems – Control Room JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A SGTR has occurred in the D Steam Generator.
- EP/1/A/5000/E-3 has been completed through Step 9.
- The D Steam Generator has been isolated.
- All NC Pumps are running.

INITIATING CUE:

The CRSRO has directed you to cooldown the NC System to 520°F starting with Step 10.b of EP/1/A/5000/E-3, Steam Generator Tube Rupture.

SIM JPM C

Facility: McGuire Task No.: MO-8301, MO-3308
 Task Title: Start "1B" Reactor Coolant Pump JPM No.: 2008 Systems - Control Room JPM C (A)

K/A Reference: 003 A4.06 2.9 / 2.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown) has been implemented following a Reactor Trip on Unit 1.
- All Initial Conditions for NC Pump start-up are satisfied, all R&R's have been evaluated, and all valve checklists are complete.
- Seal Injection flow and KC flow to the Thermal Barrier have been maintained to all NCPs throughout the event.

Task Standard: Reactor Coolant Pump '1B' is started following start of 1B1 or 1B2 Oil Lift Pump, and the operator properly adjusts level in the NC Pump Standpipe. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: EP/1/A/5000/ES-0.2 Natural Circulation Cooldown
 OP/1/A/6150/002A Reactor Coolant Pump Operation
 McGuire Unit 1 Core Data Book

Handouts: OP/1/A/6150/002A Reactor Coolant Pump Operation, Enclosure 4.1
 OP/1/A/6150/002A Reactor Coolant Pump Operation, Enclosure 4.3

Initiating Cue: The CRSRO has directed you to start the 1B NC Pump by completing Step 3.5 of Enclosure 4.1 (Startup and Operation) of OP/1/A/6150/002A (Reactor Coolant Pump Operation).

Time Critical Task: NO

Validation Time: 15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset Simulator to IC-39, MOL 100% Power
2. Manually trip the Reactor
3. Allow the plant to stabilize while performing Operator Actions of EP/ES-0.1 through step 32
4. Insert the following to turn off every other cooling group on the main step-up transformers:

ANN-AD11-B05 (XFMR 1A TROUBLE) = 0
ANN-AD11-E05 (XFMR 1B TROUBLE) = 0
5. At step 32 stop the A, B, C, and D NC Pumps
6. Allow plant to stabilize
7. Freeze Simulator

OR

1. Reset to IC-111 (May 2008)

NOTE: Operator should review Section 1.0 and 2.0 of procedure while waiting in Briefing Room prior to performance of JPM.

NOTE: During the performance of the JPM, the Simulator Driver will be required to monitor the 1B NCP Standpipe level and ensure that the level does not increase and clear the LO Level Alarm. If the level rises, drain the standpipe as follows:

- Use LOA-NV-032 to open 1NV-461, "Standpipe Drain Valve," to lower level UNTIL the operator is ready to re-fill the Standpipe, THEN Close Drain Valve. See note prior to JPM Step 10.

NOTE: During the performance of the JPM, the Simulator Driver will be required to acknowledge spurious alarms unrelated to the task being performed.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout OP/1/A/6150/002A, with Enclosure 4.1 marked up for placekeeping through Step 3.5.1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 3.5.2) Check the associated 6900 V supply breaker closed.	Operator observes supply breaker to Bus 1TB, red status light lit.		
2	(Step 3.5.3) Check reactor power less than 25%.	Operator observes that the reactor is tripped.		
3	(Step 3.5.4) Check 1B NC Pump No. 1 Seal D/P is greater than 200 psi.	Operator observes 1B NC Seal ΔP , 1NVP-5220, and notes ΔP is greater than 500 psi.		
4	(Step 3.5.5) Check VCT pressure equal to or greater than 15 PSIG.	Operator observes VCT Pressure, 1NVP-5500, and notes pressure is 25-45 psig.		
5	(Step 3.5.6) Check 8 GPM seal injection flow established to 1B NC Pump.	Operator observes 1B NC Pump Seal Flow, 1NVP-5320, and notes flow is 8 gpm.		
6	(Step 3.5.7) Check upper and lower oil pot levels satisfactory via computer or by visual inspection of 1B NC Pump.	Operator uses OAC, NCPMPALL, and notes that lower and upper oil levels – all green.		
7	(Step 3.5.8) Check 1NC-29 (B Loop Spray Control) Closed.	Operator observes that the green status light is lit on the B Loop Pzr Spray controller.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Caution prior to Step 3.5.9) Starting an NC Pump with either Pressurizer Spray Valve open will increase spray flow and affect NC System pressure.	Operator reads Caution.		
9	(Step 3.5.9) IF 1A NC Pump is off, ensure 1NC-27 (A Loop Pzr Spray Control) closed.	Operator observes that the green status light is lit on the A Loop Pzr Spray controller.		
<p>NOTE: During the performance of the JPM, the Simulator Driver will be required to monitor the 1B NCP Standpipe level and ensure that the level does not increase and clear the LO Level Alarm. If the level rises, drain the standpipe as follows:</p> <ul style="list-style-type: none"> • Use LOA-NV-032 to open 1NV-461, "Standpipe Drain Valve," to lower level UNTIL the operator is ready to re-fill the Standpipe, THEN Close Drain Valve. See note prior to JPM Step 10. 				
10	<p>(Step 3.5.10) IF 1B NC Pump No.1 seal leakoff on NOT greater than or equal to the minimum leakoff required per Unit 1 Data Book, perform one of the following:</p> <p>(Step 3.5.10.1) Check that a 0.2 gpm increase occurred during pressurization. OR (Step 3.5.10.2) Perform Enclosure 4.4 (Operator Action for Low No.1 Seal Leakoff Flow) to locally measure flow.</p>	<p>Operator addresses Data Book Enclosure 4.3, Curve 1.9.</p> <p>Operator determines actual Seal ΔP by subtracting VCT pressure (45 psig) from NC System pressure (2235 psig).</p> <p>Operator observes seal leak off recorder, 1MNVCR-5140, and determines that leak off flow is within the acceptable limits established by curve 1.9.</p>		
11	(Step 3.5.11) IF either 1B NC Pump Standpipe alarm is lit, refer to Enclosure 4.3 (Filling and Draining NC Pump Standpipe) to adjust level.	Operator observes that AD-7/B-2, "NC Pump B No. 2 Seal S-Pipe Lo Level," annunciator is LIT, and goes to Enclosure 4.3 (Alternate Path).		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Cue: When it is apparent that operator is seeking to use Enclosure 4.3, Examiner provide copy.		
12	(Step 3.1) Evaluate all outstanding R&Rs that may impact performance of this procedure.	Operator addresses Initial Conditions, or asks CRSRO. Cue: If asked, there are no outstanding R&Rs that will impact this procedure.		
13	(Step 3.2) Perform the following sections, as applicable: Section 3.3, Filling NC Pump Standpipes.	Operator determines that Section 3.3 must be performed as addresses this section.		
14	(Step 3.3) Filling NC Pump Standpipes: (Step 3.3.1) Check Reactor Makeup Water System in operation per OP/1/A/6200/012 (Reactor Makeup Water System).	Operator observes Reactor Makeup Water pressure normal, and both NB Pumps with power available but OFF. Cue: Reactor Makeup Water System in operation per OP/1/A/6200/012.		
15	(Step 3.3.2) Check 1NC-56B (PRT Spray Cont Outside Isol) open.	Operator observes red valve status light lit.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	(Step 3.3.3) Open applicable valve(s): 1NV-55B (B NC Pump Standpipe Fill).	Operator presses OPEN pushbutton, observes red status light lit.		
*17	(Step 3.3.4) If required, ensure running: 1A Rx M/U Water Pump OR 1B Rx M/U Water Pump	Operator places control switch for either 1A or 1B NB Pump to START, observes red breaker status light lit.		
18	(Step 3.3.5) When applicable "NC Pump No.2 Seal S-Pipe Lo Lvl" alarm clears, perform the following: (Step 3.3.5.1) If pump started in Step 3.3.4, stop applicable pump: 1A Rx M/U Water Pump OR 1B Rx M/U Water Pump	Operator places control switch for either 1A or 1B NB Pump to STOP, observes green breaker status light lit.		
19	(Step 3.3.5.2) Close applicable valve: 1NV-55B (B NC Pump Standpipe Fill).	Operator presses CLOSE pushbutton, observes green status light lit. NOTE: If the "1B NC Pump No.2 Seal S-Pipe Hi Lvl" alarm comes in, perform section 3.4 of Enclosure 4.3. Operator returns to Enclosure 4.1, Step 3.5.12.		
*20	(Step 3.5.12) Two minutes prior to starting 1B NC Pump, start one of the associated oil lift pumps.	Operator depresses start pushbutton for either 1B1 or 1B2 Oil Lift Pumps, and observes red breaker status light is lit.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		<p>Cue:</p> <p>2 minutes has elapsed.</p>		
21	(Step 3.5.13) Announce starting of 1B NC Pump.	Operator makes announcement.		
22	(Caution prior to Step 3.5.14) In Low Pressure Mode, PORVs will open on NC Narrow Range Pressure of 378-382 psig.	Operator reads Caution.		
*23	(Step 3.5.14) Start 1B NC Pump	<p>Operator presses Start pushbutton and observes red breaker status light lit.</p> <p>Operator observes Motor amps increase, spike high, and then stabilize lower.</p> <p>Operator observes NC System flow for the 1B NC Loop increases to 100%.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
24	<p>(Step 3.5.15) Perform one of the following:</p> <p>(Step 3.5.15.1) If desired to stop 1B NC Pump in less than two minutes after start...</p> <p>(Step 3.5.15.2) Check oil lift pump started, stops within 2 minutes after 1B NC Pump starts.</p>	Operator determines that the 1B NC Pump will continue to run, and after two minutes observes that the green breaker status light is lit for the oil lift pump previously started.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown) has been implemented following a Reactor Trip on Unit 1.
- All Initial Conditions for NC Pump start-up are satisfied, all R&R's have been evaluated, and all valve checklists are complete.
- Seal Injection flow and KC flow to the Thermal Barrier have been maintained to all NCPs throughout the event.

INITIATING CUE:

The CRSRO has directed you to start the 1B NC Pump by completing Step 3.5 of Enclosure 4.1 (Startup and Operation) of OP/1/A/6150/002A (Reactor Coolant Pump Operation).

SIM JPM D

Facility: McGuire Task No.: MO-3314

Task Title: Operate the Turbine Driven CA Pump from the Control Room JPM No.: 2008 Systems - Control Room JPM D

K/A Reference: 061 A2.06 2.7/3.0

Examinee: Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- Unit 1 is operating at 99% power.
 - Maintenance has requested Operations to run the TD CA Pump to allow them to check vibration.
 - A normal start of the TD CA Pump is desired, NOT a slow start.
 - The CRSRO has declared the TD CA Pump inoperable and logged it in Tech Specs.
 - All initial conditions have been satisfied, all valves are aligned per the valve checklist, and all R&R's have been evaluated.
 - An NLO (Bob) is standing by locally at the pump to assist in the operation.

Task Standard: Operate the #1 TD CA Pump in recirc from the Control Room. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: OP/1/A/6250/002, Auxiliary Feedwater System

Handouts: OP/1/A/6250/002, Auxiliary Feedwater System

Initiating Cue: The CRSRO has directed you to start the TD CA Pump per OP/1/A/6250/002 Enclosure 4.4 (Manual Operation of #1 TD CA Pump) from the Control Room and run it in recirc for 10 minutes.

Time Critical Task: NO

Validation Time: 10 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset the Simulator to IC-39, 100% MOL
2. Reduce power to approximately 99%.
3. Allow plant to stabilize.
4. Freeze the Simulator.

OR

1. Reset to IC-122 (May 2008)

NOTE: Operator should review Section 1.0 and 2.0 of procedure while waiting in Briefing Room prior to performance of JPM.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout OP/1/A/6250/002, with Enclosure 4.4 marked up for placekeeping through step 3.3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 3.4) Perform the following sections, as applicable: Section 3.5, Starting TD CA pump	Operator proceeds to section 3.5.		
2	(Step 3.5) Starting #1 TD CA Pump (Step 3.5.1) Notify RP of TD CA Pump start.	Operator calls RP, and (after cue) records "George Franklin" in blank provided and places present time and date on page. Cue: George Franklin of RP has been notified.		
3	(Step 3.5.2) <u>IF</u> in Modes 1-3, declare TD CA Pump inoperable	Operator determines from initial conditions that the TD CA has been declared inoperable. Cue: IF asked by operator, Examiner initial Step 3.5.2 as CRSRO.		
4	(Step 3.5.3) IF CA Pump to be operated locally.....	Operator determines from initial conditions that the CA pump is to be run from the control room.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Operator places an "NA" in step 3.5.3.		
* 5	<p>(Step 3.5.4) Close the following valves:</p> <ul style="list-style-type: none"> • 1CA-64 (TD CA Pump to S/G A) • 1CA-52 (TD CA Pmp to S/G B) • 1CA-48 (TD CA Pump to S/G C) • 1CA-36 (TD CA Pump to S/G D) 	<p>Operator accesses CA Map on OAC.</p> <p>Operator rotates control knob counterclockwise for 1CA-64 and observes black/blue needle at 0%.</p> <p>Operator observes valve position for 1CA-64 on OAC change from red to green and acknowledges the OAC Alarm.</p> <p>Operator rotates control knob counterclockwise for 1CA-52 and observes black/blue needle at 0%.</p> <p>Operator observes valve position for 1CA-52 on OAC change from red to green and acknowledges the OAC Alarm.</p> <p>Operator rotates control knob counterclockwise for 1CA-48 and observes black/blue needle at 0%.</p> <p>Operator observes valve position for 1CA-48 on OAC change from red to green and acknowledges the OAC Alarm.</p> <p>Operator rotates control knob counterclockwise for 1CA-36 and observes black/blue needle at 0%.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Operator observes valve position for 1CA-36 on OAC change from red to green and acknowledges the OAC Alarm.		
6	<p>(Step 3.5.5) Drain moisture from the #1 CA Pump Turbine stop valve as follows:</p> <p>(Step 3.5.5.1) Slowly open the following:</p> <ul style="list-style-type: none"> • 1SA-39 (Aux FDWP #1 Stop Valve Above Seat Drain) • 1SA-40 (Aux FDWP #1 Stop Valve Below Seat Drain) <p>(Step 3.5.5.2) When 30 seconds have elapsed, close 1SA-39 and 1SA-40.</p> <p>(Step 3.5.5.3) IF water hammer occurred while draining moisture from #1 CA Pump Turbine Stop Valve, notify System Engineer.</p>	<p>Operator dispatches an NLO to perform this task locally.</p> <hr/> <p>Cue: (Booth)</p> <p>NLO Bob Jones reports 1SA-39 and 1SA-40 have been opened for 30 seconds and reclosed.</p> <hr/> <p>CUE: (Booth)</p> <p>No indications of water hammer were noted.</p> <hr/> <p>Operator places an "NA" in step 3.5.5.3.</p>		
7	<p>(Step 3.5.6) Check the following open:</p> <p>1CA-2 (Unit 1 CA Pumps Suct From CA Stor Tank Isol)</p> <p>1CA-7AC (TD CA Pump Suction Isol)</p>	<p>Operator observes OAC map displays 1CA-2 as red and determines valve to be open.</p> <p>Operator observes OAC map displays 1CA-7AC as red and determines valve</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		to be open, OR Operator observes valve red status light lit.		
8	(CAUTION prior to Step 3.5.7): Starting TD CA Pump will increase Rx Power due to increased steam flow. Reducing Turbine Generator load may be required to maintain power level.	Operator reads Caution. CUE: Another operator will monitor and adjust Rx Power as required.		
9	(NOTES prior to Step 3.5.7): It is preferred to perform a normal start of the TD CA Pump. If a slow start of the TD CA Pump is to be performed, Engineering should be available to provide guidance.	The operator reads Notes and recognizes that a normal start is being performed.		
10	(Step 3.5.7) Start "#1 TD CA Pump" per step 3.5.7.1 or 3.5.7.2 (NA Step not performed).	Operator decides to start pump per step 3.5.7.1 and places an "NA" in Step 3.5.7.2.		
*11	(Step 3.5.7.1) IF normal start is desired, perform the following: (Step 3.5.7.1. A) Place the "#1 TD CA Pump" in "START"	Operator rotates the #1 TD CA Pump control switch clockwise to the START position.		
12	(Step 3.5.7.1. B) Check the following open: • 1SA-48 ABC (SM from	Operator observes both 1SA-48ABC and 1SA-49AB red status lights lit.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	S/G C to TD CA Pump Isol) <ul style="list-style-type: none"> 1SA-49 AB (SM from S/G B to TD CA Pump Isol) 	Operator observes TD CA Pump speed increases to 3800 rpm. Operator observes that MCB Annunciator 1AD5- F2 alarms momentarily, and notes that this is an expected alarm.		
13	(Step 3.5.7.1. C) Check recirc valve opens by "FLOW" lit.	Operator observes the TD CA Pump miniflow status light lit.		
14	(Step 3.5.7.1. D) IF operating CA Pump to cool piping, allow pump to run for at least 10 minutes.	Operator determines TD CA pump run is NOT due to cooling piping. CUE: 10 minutes has elapsed, This JPM is complete.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is operating at 99% power.
- Maintenance has requested Operations to run the TD CA Pump to allow them to check vibration.
- A normal start of the TD CA Pump is desired, NOT a slow start.
- The CRSRO has declared the TD CA Pump inoperable and logged it in Tech Specs.
- All initial conditions have been satisfied, all valves are aligned per the valve checklist, and all R&R's have been evaluated.
- An NLO (Bob) is standing by locally at the pump to assist in the operation.

INITIATING CUE:

The CRSRO has directed you to start the TD CA Pump per OP/1/A/6250/002 Enclosure 4.4 (Manual Operation of #1 TD CA Pump) from the Control Room and run it in recirc for 10 minutes.

SIM JPM E

Facility: McGuire

Task No.:

Task Title: Manually Actuate Containment
Spray SystemJPM No.: 2008 Systems - Control
Room JPM E (A)

K/A Reference: 026 A2.03 4.1/4.4

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- With Unit 1 at 100% power a Reactor Trip occurs.
- In response, the crew enters E-0, "Reactor Trip or Safety Injection," and then transitions to ES-0.1, "Reactor Trip Response."
- Subsequently, a Steam Rupture occurred inside the Containment causing a Safety Injection.
- An Orange Path exists on the Containment Critical Safety Function Status Tree due to high Containment Pressure, and the crew has transitioned to FR-Z.1, "Response to High Containment Pressure," and completed actions through step 9.

Task Standard:

Manually open the B Train NS Pump Discharge Containment Isolation Valves and start the 1B NS Pump. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: EP/1/A/5000/FR-Z.1, Response to High Containment Pressure

Handouts: EP/1/A/5000/FR-Z.1, Response to High Containment Pressure

Initiating Cue: The CRSRO has directed you to check the NS System in Operation in accordance with step 10 of FR-Z.1, "Response to High Containment Pressure."

Time Critical Task: NO

Validation Time: 5 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39, 100% Power
2. Place in RUN and allow time to stabilize
3. Insert Malfunctions ISE005A/B, NS System Actuation Auto Failure/Manual Failure
4. Insert Malfunctions NS003C/D (to 0), 1NS-29A and 1NS-32A remain closed
5. Manually trip the reactor
6. Perform the actions of EP/1/A/5000/E-0 up through step 5 and transition to ES-0.1.
7. After performing steps 1-11 in ES-0.1, insert Malfunction SM007A, Steam Rupture Inside Containment, A Steam Generator
8. Ensure Safety Injection actuates automatically and all equipment responds as expected with the exception of NS System
9. Ensure Orange Path on Containment exists due to High Containment Pressure.
10. Complete Steps 1-9 of FR-Z.1.
11. Freeze the Simulator

OR

1. Reset Simulator to Temporary Snap IC-105 (May 2008).

NOTE: During the performance of the JPM, the Simulator Driver will be required to acknowledge spurious alarms unrelated to the task being performed.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout EP/1/A/5000/FR-Z.1 marked up for placekeeping through step 9.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(Step 10) Check NS System in operation as follows:</p> <p>(Step 10.a) Check EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc) – IN EFFECT.</p> <p>(Step 10.a RNO) GO TO Step 10.d.</p>	<p>Operator recognizes from Initial Conditions that ECA-1.1 is NOT in effect.</p> <p>Operator proceeds to Step 10.d.</p>		
2	<p>(Step 10.d) Check NS suction - ALIGNED TO FWST AS FOLLOWS:</p> <p>Check 1NS-18A (A NS Pump Suct From Cont Sump) – CLOSED</p> <p>Check 1NS-20A (A NS Pump Suct From FWST) - OPEN</p> <p>Check 1NS-1B (B NS Pump Suct From Cont Sump) - CLOSED</p> <p>Check 1NS-3B (B NS Pump Suct From FWST) - OPEN.</p>	<p>Operator observes green breaker status light lit.</p> <p>Operator observes red breaker status light lit.</p> <p>Operator observes green breaker status light lit.</p> <p>Operator observes red breaker status light lit.</p>		
3	<p>(Step 10.e) Check containment pressure - GREATER THAN 3 PSIG.</p>	<p>Operator observes four instruments above NS Pump controls and determines Containment Pressure is > 8 PSIG.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<p>(Step 10.f) Check NS pump discharge valves - OPEN:</p> <p>1NS-32A (A NS Pump Disch Cont Outside Isol).</p> <p>1NS-29A (A NS Pump Disch Cont Outside Isol).</p> <p>1NS-12B (B NS Pump Disch Cont Outside Isol).</p> <p>1NS-15B (B NS Pump Disch Cont Outside Isol).</p>	<p>Operator observes green breaker status light lit.</p> <p>Operator observes green breaker status light lit.</p> <p>Operator observes green breaker status light lit.</p> <p>Operator observes green breaker status light lit.</p>		
*5	<p>(Step 10.f RNO) Perform the following:</p> <p>(Step 10.f RNO 1) Open valves.</p> <p>(Step 10.f RNO 2) IF all four valves are closed, THEN.....</p>	<p>Operator attempts to open 1NS-32A by pressing the OPEN pushbutton, and recognizes valve does NOT open, green status light lit (Alternate Path).</p> <p>Operator attempts to open 1NS-29A by pressing the OPEN pushbutton, and recognizes valve does NOT open, green status light lit.</p> <p>Operator attempts to open 1NS-12B by pressing the OPEN pushbutton, and observes red status light lit.</p> <p>Operator attempts to open 1NS-15B by pressing the OPEN pushbutton, and observes red status light lit.</p> <p>Operator recognizes that two of four valves have opened and that the step does NOT apply.</p> <p>Operator proceeds to step 10.g.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Step 10.g) Check NS pumps - ON.	Operator observes green breaker status lights for each pump, and proceeds to RNO.		
*7	<p>(Step 10.g RNO) Perform the following:</p> <p>(Step 10.g RNO 1) Start pump(s) with available suction and discharge flowpaths.</p> <p>(Step 10.g RNO 2) IF both pumps off, THEN.....</p>	<p>Operator recognizes that the 1B NS Pump is the only pump with a suction and discharge flowpath and starts the 1B NS Pump by pressing the START pushbutton.</p> <p>Operator observes 1B NS Pump red breaker status light is lit.</p> <p>Operator recognizes that 1 of 2 pumps are running and that step does not apply. Proceeds to step 11.</p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- With Unit 1 at 100% power a Reactor Trip occurs.
- In response, the crew enters E-0, "Reactor Trip or Safety Injection," and then transitions to ES-0.1, "Reactor Trip Response."
- Subsequently, a Steam Rupture occurred inside the Containment causing a Safety Injection.
- An Orange Path exists on the Containment Critical Safety Function Status Tree due to high Containment Pressure, and the crew has transitioned to FR-Z.1, "Response to High Containment Pressure," and completed actions through step 9.

INITIATING CUE:

The CRSRO has directed you to check the NS System in Operation in accordance with step 10 of FR-Z.1, "Response to High Containment Pressure."



SIM JPM F

To be run in conjunction with JPM A

Facility: McGuire Task No.:

Task Title: Start Outside Air Pressure Filter Fan Following Damage of Spent Fuel Assembly JPM No.: 2008 Systems - Control Room JPM F

K/A Reference: APE 036 AK3.03 3.7 / 4.1

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- Unit 1 is at 55%.
 - Spent fuel is being transferred from the Unit 1 Spent Fuel Pool to a NAC-UMS cask in the Fuel Building.
 - 20 minutes ago, the Control Room received a report that a fuel assembly had been dropped into the Spent Fuel pool.
 - The fuel handling supervisor reports gas bubbles originating from the dropped fuel assembly and 1EMF-42, FUEL BLDG VENT HI RAD is in Trip 2.
 - The operating crew has completed AP/1/A/5500/25 (Spent Fuel Damage) up to step 15.

Task Standard: One train of Outside Air Pressure Filter train is in service within 10 minutes. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: AP/1/A/5500/25, Spent Fuel Damage

Handouts: AP/1/A/5500/25, Spent Fuel Damage, Enclosure 1

Initiating Cue: The CRSRO has directed you to place one Outside Air Pressure Filter train in service per Enclosure 1 (Control Room Pressurization) of AP/1/A/5500/25 (Spent Fuel Damage).

Time Critical Task: YES (10 minutes)

The Time Critical Action is to start the OAPF Fan within 30 minutes of spent fuel assembly anywhere on site becoming damaged. This includes dry cask storage. Starting the OAPF Fan within 30 minutes will limit dose to Control Room personnel during a fuel handling accident.
Assumptions:

- 15 minutes for Control Room personnel to realize AP/25 applies, plus time to read AP and hand-off Enclosure 1.
- 15 minutes for operator to perform Enclosure 1.

This JPM places the operator 20 minutes into the event and forms the basis of the 10 minute Time Critical nature.

Validation Time: 5 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset Simulator to Temporary Snap IC-115 (May 2008).
2. Place VF in filter mode (close "VF EXH BYP DMPR CNTRL")
3. Acknowledge alarms
4. Freeze simulator

NOTE: To be run in conjunction with JPM A.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/25, Enclosure 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p>(Step 1) Ensure one of the following groups of air intake valves are open:</p> <p>Unit 1 air intake valves:</p> <p>1VC-1A (VC Otsd Air Intake Isol from Unit 1)</p> <p>1VC-2A (VC Otsd Air Intake Isol from Unit 1)</p> <p>1VC-3B (VC Otsd Air Intake Isol from Unit 1)</p> <p>1VC-4B (VC Otsd Air Intake Isol from Unit 1)</p> <p>OR</p> <p>Unit 2 air intake valves:</p> <p>1VC-9A (VC Otsd Air Intake Isol from Unit 2)</p> <p>1VC-10A (VC Otsd Air Intake Isol from Unit 2)</p> <p>1VC-11B (VC Otsd Air Intake Isol from Unit 2)</p> <p>1VC-12B (VC Otsd Air Intake Isol from Unit 2)</p>	<p>Operator determines that the Unit 1 valves are open by observing the red status light lit for each valve (Enclosed within Green Mimic Box on MCB).</p> <p>OR</p> <p>Operator determines that the Unit 2 valves are open by observing the red status light lit for each valve (Near Gold Mimic Box on MCB).</p>		
2	<p>(Step 2) IF A train VC/YC in operation, THEN place "A TRAIN CR OUTSIDE AIR PRESS FAN" to "ON".</p>	<p>Operator observes Train A VC/VY Mode Select Switch is selected to OFF and determines Train A VC/VY NOT in operation.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 3) IF B train VC/YC in operation, THEN place "B TRAIN CR OUTSIDE AIR PRESS FAN" to "ON".	<p>Operator observes Train B VC/VY Mode Select Switch is selected to TRN B.</p> <p>Operator observes Train B Fan/Chiller red status lights lit and determines B Train VC/VY is in operation.</p> <p>Operator rotates the B Train CR Outside Air Press Fan control switch clockwise to ON.</p> <p>Operator observes B Train CR Outside Air Fan ON.</p> <p>Operator observes B Train CR Filter Preheat enabled.</p> <p>Operator observes CRA-OAPFT-2 dampers open, red status lights lit.</p>		
4	(Step 4) Depress "MAN" for the following: #1 CRA OUTSD AIR FAN	<p>Operator presses white MAN pushbutton causing AUTO pushbutton to pop out.</p> <p>Operator observes no change in green status light lit.</p>		
*	#2 CRA OUTSD AIR FAN	<p>Operator presses white MAN pushbutton causing AUTO pushbutton to pop out.</p> <p>Operator observes green status light lit, red status light off.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<p>(Step 5) Depress "OFF" for the following:</p> <p>CRA-OAD-4 (CR Area Otsd Air Fans Damper)</p> <p>CRA-OAD-3 (CR Area Otsd Air Fans Damper)</p>	<p>Operator presses the CRA-OAD-4 OFF pushbutton, and observes green status light lit, red status light off.</p> <p>Operator presses the CRA-OAD-3 OFF pushbutton, and observes green status light lit, red status light off.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____ **Time Critical Stop Time** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is at 55%.
- Spent fuel is being transferred from the Unit 1 Spent Fuel Pool to a NAC-UMS cask in the Fuel Building.
- 20 minutes ago, the Control Room received a report that a fuel assembly had been dropped into the Spent Fuel pool.
- The fuel handling supervisor reports gas bubbles originating from the dropped fuel assembly and 1EMF-42, FUEL BLDG VENT HI RAD is in Trip 2.
- The operating crew has completed AP/1/A/5500/25 (Spent Fuel Damage) up to step 15.

INITIATING CUE:

The CRSRO has directed you to place one Outside Air Pressure Filter train in service per Enclosure 1 (Control Room Pressurization) of AP/1/A/5500/25 (Spent Fuel Damage).

NOTE: This is a Time Critical JPM



SIM JPM G

Facility: McGuire

Task No.:

Task Title: Respond to a Source Range
Nuclear Instrumentation FailureJPM No.: 2008 Systems - Control
Room JPM G (A)

K/A Reference: 015 A2.01 3.5/3.9

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- Unit 1 is in the process of performing a Unit Start-Up.
 - Control Bank "A" has been pulled to 50 steps withdrawn.
 - Mode 2 has just been declared.
 - Source Range count rate is approximately 110 CPS.
 - SR channel N-31 has failed low.
 - SR channel N-32 is still OPERABLE.
 - AP/1/A/5500/16 Case I (Source Range Malfunctions) has been implemented.

Task Standard: All Source Range Selector switches are placed to channel 32 and the SR trip and High Flux at Shutdown signals from channel 31 are blocked. When the only other channel of SR Nuclear Instrumentation fails high and the reactor does not trip, the Operator recognizes a reactor trip is required and then manually trips the Reactor. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: AP/1/A/5500/16 Malfunction of Nuclear Instrumentation
OP/1/A/6100/010A, ARP1FO1/A-6, S/R HI Flux Rx Trip
McGuire Technical Specifications, 3.3.1 RTS Instrumentation
EP/1/A/A/5000/E-0 Reactor Trip or Safety Injection

Handouts: AP/1/A/5500/16 Malfunction of Nuclear Instrumentation, Case I

Initiating Cue: The CRSRO has directed you to remove the failed SR channel (N-31) from service by performing AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation), Case I (Source Range Malfunctions).

Time Critical Task: NO

Validation Time: 7 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset Simulator to IC-26 (Mode 2, Normal operating temp/press, CBA at 50 steps withdrawn.)
2. Insert Mal ENB-2A (SR Channel 31 Failure); Select = 0, Activate
3. Insert Mal IPE001A (Failure of Auto Reactor Trip A train)
4. Insert Mal IPE001B (Failure of Auto Reactor Trip B train)
5. Insert Mal ENB-002B (SR Channel 32 Failure); Set = 1e+006, Set to Trigger 1.
6. Freeze Simulator.
7. Go to RUN.
8. Place "Audio Count Rate" and "Startup Rate" selectors to SR N-32 prior to implementing this JPM.

OR

1. Reset Simulator to Temporary Snap IC-80 (May 2008).

NOTE: During the performance of the JPM, the Simulator Driver will be required to activate Trigger #1 when the operator checks the "S/R HI FLUX ALM BLOCKED" annunciator in AP16 Case I, step 13.c.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout AP/1/A/5500/16, Case I.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Caution prior to Step 1) Pulling S/R control power fuses anytime the S/R is energized will result in a reactor trip unless the affected channel is blocked in SSPS ("S/R TRAIN (A/B) TRIP BLKD HI VOLTAGE OFF" status light on 1SI-18 is lit).	Operator reads Caution.		
2	(Caution prior to Step 1) Pulling S/R instrument power fuses with the S/R energized will result in a reactor trip unless: <ul style="list-style-type: none"> Affected channel "LEVEL TRIP" switch is in "BYPASS" OR <ul style="list-style-type: none"> Affected channel is blocked in SSPS ("S/R TRAIN (A/B) TRIP BLKD HI VOLTAGE OFF" status light on 1SI-18 is lit). 	Operator reads Caution.		
3	(Note prior to Step 1) Audio count rate is only supplied from S/R channels N-31 or N-32.	Operator reads Note.		
4	(Notes prior to Step 1) In Mode 6, the W/R Neutron Flux Monitors can be used as S/R neutron flux indication.	Operator reads Note.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 1) Check at least one of the following S/R Channels - OPERABLE N-31 OR N-32	Operator recognizes that SR Channel N32 is OPERABLE as identified in the initial conditions.		
6	(Step 2) Announce occurrence on paging system.	Operator makes a page announcement indicating that SR Channel N31 has failed. Cue: If asked, the U2 RO makes the page announcement.		
7	(Step 3) Check unit status - IN MODE 6.	Operator recognizes from initial conditions that the plant is in Mode 2 and proceeds to the RNO		
8	(Step 3 RNO) GO TO Step 6.	Operator proceeds to Step 6.		
9	(Step 6) Check S/R detector(s) - HIGH VOLTAGE INADVERTENTLY APPLIED AT POWER (ABOVE P-10).	Operator determines from initial conditions that the plant is in Mode 2 and proceeds to the RNO		
10	(Step 6 RNO) GO TO Step 7	Operator proceeds to Step 7.		
11	(Step 7) Check "S/R HI FLUX AT SHUTDOWN" alarm (1AD2-D3) - DARK	Operator observes MCB Annunciator 1AD2/D3 and determines that the window is dark.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	(Step 8) Monitor available I/R Channels and W/R Neutron Flux Monitors	Operator observes Neutron Flux is below the I/R Channels scale. Operator observes that W/R Monitor indications are stable.		
13	(Step 9) Check if failure has occurred on any of the following S/R Channels: N-31 OR N-32	Operator determines from initial conditions that N-31 has failed. Operator observes SR Channel N31 indication at "0."		
14	(Step 10) Check at least one of the following S/R channels – OPERABLE N-31 OR N-32	Operator recognizes that SR Channel N32 is OPERABLE as identified in the initial conditions. Operator observes SR Channel N32 is reading 110 CPS.		
15	(Step 11) Check plant status - IN MODE 3 OR BELOW	Operator determines from initial conditions that the plant is in Mode 2 and proceeds to the RNO.		
16	(Step 11 RNO) IF in Mode 2 below P-6, THEN suspend operations involving positive reactivity additions.	Operator determines unit is in Mode 2 and below P-6 (10 ⁻¹⁰ IR amps), and observes rod withdrawal has stopped. Cue: Rx Startup has been suspended.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	<p>(Step 12) Perform the following actions on the failed S/R drawer:</p> <p>* (Step 12.a) Place the "LEVEL TRIP" switch to "BYPASS"</p> <p>(Step 12.b) Check "LEVEL TRIP BYPASS" light - LIT</p> <p>(Step 12.c) Place the "HIGH FLUX AT SHUTDOWN" switch to "BLOCK".</p>	<p>Operator places the N31 Level Trip switch to BYPASS and observes Level Trip light is lit.</p> <p>Operator recognizes that the High Flux at Shutdown Switch in the "BLOCK" position.</p>		
18	<p>(Step 13) Check the following -LIT:</p> <p>(Step 13.a) "S/R OR I/R TRIP BYPASS" alarm (1AD-2, E-2).</p> <p>(Step 13.b) The failed channel's status light on 1SI-19:</p> <ul style="list-style-type: none"> • "1/N-31B S/R CHANNEL I TRIP BYPASS" <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • "1/N-32B S/R CHANNEL II TRIP BYPASS". <p>(Step 13.c) "S/R HI FLUX ALM BLOCKED" alarm (1AD-2, D-2).</p>	<p>Operator observes MCB Annunciator 1AD2/E2 and determines that the window is lit.</p> <p>Operator observes the N31 Trip Bypass status light is lit.</p> <p>Operator observes MCB Annunciator 1AD2/D2 and determines that the window is lit.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
<p>NOTE: Simulator Driver Operate Trigger #1.</p> <p>This will cause the "S/R HI FLUX RX TRIP" alarm on 1FO-1/A5 (An automatic Reactor Trip should occur, however, the RPS has failed. The Operator may address the Annunciator Response Procedure, however, it is expected that the reactor will be manually tripped)</p> <p>Examiner NOTE: (Alternate Path) It is expected that the operator will Trip the Reactor.</p>				
*19	(Step 2) Check Reactor Trip <ul style="list-style-type: none"> • All rod bottom lights – LIT • Reactor trip and bypass breakers – OPEN • I/R amps – GOING DOWN 	NOTE: The remainder of the operator actions will be performed from memory <p>Operator observes all Rod Bottom lights are lit (green).</p> <p>Operator observes Reactor Trip Breaker green status lights are lit.</p> <p>Operator observes that both I/R SUR indications are trending down</p>		
20	(Step 3) Check Turbine Trip <ul style="list-style-type: none"> • All throttle valves - CLOSED 	<p>Operator observes the Four STAT lights for throttle valves are lit.</p>		
21	(Step 4) Check 1ETA and 1ETB - ENERGIZED	<p>Operator observes that UV STAT lights for 1ETA and 1ETB are DARK.</p>		
22	(Step 5) Check if S/I is actuated: (Step 5.a) "SAFETY INJECTION ACTUATED" status light (1SI-18)- LIT.	<p>Operator observes that S/I actuate light is DARK.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	(Step 5.a RNO) Perform the following: (Step 5.a RNO 1) Check if S/I is required: Pzr pressure less than 1845 OR Containment pressure greater than 1 PSIG	Operator observes that Pzr pressure is 2100 and stable and that Containment pressure is .15 PSIG and stable; and reports that Safety Injection is NOT required. Cue: Another operator will complete the remainder of this procedure.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is in the process of performing a Unit Start-Up.
- Control Bank "A" has been pulled to 50 steps withdrawn.
- Mode 2 has just been declared.
- Source Range count rate is approximately 110 CPS.
- SR channel N-31 has failed low.
- SR channel N-32 is still OPERABLE.
- AP/1/A/5500/16 Case I (Source Range Malfunctions) has been implemented.

INITIATING CUE:

The CRSRO has directed you to remove the failed SR channel (N-31) from service by performing AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation), Case I (Source Range Malfunctions).



SIM JPM H

Facility: McGuire Task No.: MO-8308

Task Title: Restoration of Power to Unit 1
6900V Buses using Offsite Power JPM No.: 2008 Systems - Control
Room JPM H

K/A Reference: 062 A2.05 2.9 / 3.3

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A loss of all AC power has occurred on both Unit 1 and Unit 2.
- EP/1/A/5000/ECA-0.0 and EP/2/A/5000/ECA-0.0 have been implemented on their respective Units.
- On Unit 1 the 1A Diesel Generator has tripped on a loss of lube oil, and the 1B Diesel Generator has tripped on overspeed.
- Both train A and B sequencer control power breakers have been opened.
- The Dispatcher has informed you that offsite power can now be restored.

Task Standard: Power is restored to 1TA, 1TB, 1TC and 1TD. All critical tasks evaluated as satisfactory.

Required Materials: None

General References: EP/1/A/5000/ECA-0.0 Loss of all AC Power

Handouts: EP/1/A/5000/ECA-0.0 Loss of all AC Power, Enclosure 8

Initiating Cue: The CRSRO has directed you to restore power to the Unit 1 6900 Volt Buses using Offsite Power per EP/1/A/5000/ECA-0.0 Enclosure 8.

Time Critical Task: NO

Validation Time: 15 minutes

SIMULATOR OPERATIONAL GUIDELINES

1. Reset the Simulator to IC-39 100% MOL
2. Insert Malfunctions:
 - a. EP001 (Station Blackout)
 - b. 1A D/G Trips on loss of Lube Oil, MALF-DG003A, SET = 1 (D/G A), give a 60 second time delay before malfunction takes place to allow loads to sequence on
 - c. 1B D/G Trips on Overspeed, MALF-DG004B, SET = 2 (D/G B), give a 60 second time delay before malfunction takes place to allow loads to sequence on
3. Implement EP/ECA-0.0 (Loss of All AC Power) and complete through subsequent step 16.
4. At step 5 run CAEP FILE ZZRUNSSF_ECA0.0 to initiate NC Pump Seal Injection.
5. Remove Malfunction EP001 at Step 10 then use LOA EP to reset lockout relays. Verify by the Annunciator Unit 1 Lockout OFF (1AD-11/K3). LOA's 154, 155, 156, 175 and 176 SET = Reset Lockout.
6. At Step 15 c Insert Malfunction EQB002A/B to disable the Train A and B Sequencer Control Power.
7. At Step 15 d use LOA-NS005/006 to simulate pulling control power for NS Pumps.
8. OVR RL/KR Pumps:

OVR-KR003A	OVR-KR005A	OVR-RL003A
OVR-KR003B	OVR-KR005B	OVR-RL003B
OVR-KR004A	OVR-RL002A	OVR-RL004A
OVR-KR004B	OVR-RL002B	OVR-RL004B

9. Freeze the simulator after conditions stabilize

OR

1. Reset to IC-89 (May, 2008)

NOTE: During the performance of the JPM, the Simulator Driver will be required to:

- Communicate with the Operator as the TCC, NLO, and anyone else the operator needs to communicate with.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout Enclosure 8 of EP/1/A/5000/ECA-0.0.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Note prior to Step 1) This enclosure can be used to: Restore Unit 1 offsite power and then align Unit 1 6900V bus to 4160V bus. OR Restore 4160V bus if Unit 1 6900V bus is already energized.	Operator reads Note.		
2	(Step 1) Check Unit 1 6900V busses – ALL DEENERGIZED.	Operator observes OAC-EPB7KV (or an equivalent OAC map), or Normal/Standby breakers are open for Buses 1TA-1TD, and determines that all 6900 V buses are deenergized.		
3	(Step 2) Check lockout relays on relay board in Control Room - RESET.	Operator observes relay board. Cue: Lockout Relays are Reset.		
4	(Step 3) Contact Toddville TCC to coordinate the following steps using any of the following: <ul style="list-style-type: none"> • Ring down phone on Unit 2 condensate board. • Outside Bell Line • Two Way Radio 	Operator attempts to contact Toddville TCC. Cue: You are in contact with Toddville TCC.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 4) Ensure Toddville TCC concurs that offsite power is ready to be aligned from switchyard to at least one station busline.	<p>Operator asks if Toddville TCC concurs that offsite power is ready to be aligned from switchyard to at least one station busline.</p> <p>Cue:</p> <p>As Toddville TCC, "You can repower Unit 1 from Switchyard."</p>		
6	<p>(Step 5) IF AT ANY TIME busline PCBs OR MODs will not operate from the Control Room, THEN perform the following:</p> <p>(Step 5.a) Dispatch switchyard coordinator to operate affected PCBs and MODs (875-5680 or beeper 778-6633 or Toddville TCC can contact).</p> <p>(Step 5.b) IF Switchyard personnel unavailable, THEN dispatch operator to operate affected busline PCBs and MODs from Switchyard Relay House PER OP/1/A/6300/001 (Turbine Generator Startup/Shutdown), Enclosure 4.12 (Local Operation of Switchyard PCBs and MODs).</p>	Operator reads step and recognizes its conditional application.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Step 6) Open the following PCB's: PCB 8 PCB 9 PCB 11 PCB 12	Operator observes that the green status lights are lit and determines that the PCBs are open.		
8	(Step 7) Have Toddville TCC energize the required portion of Unit 1 Switchyard, to allow restoration of offsite power. Use any of the following: 230KV yellow bus from Cowan's Ford OR Any other available source.	Operator asks Toddville TCC to energize the required portion of Unit 1 Switchyard. Cue: The Switchyard is energized.		
9	(Step 8) Ensure the following are open: 1A Generator Breaker 1B Generator Breaker	Operator observes Generator Breakers, green status lights lit, and determines that both the 1A and 1B Generator breakers are open.		
10	(Note prior to Step 9) If unable to open any of the following breakers from the Control Room, Step 9.i will open breaker(s) locally.	Operator reads Note.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*11	<p>(Step 9) Remove all loads from 6900V busses as follows:</p> <p>(Step 9.a) Place the following mode select switches to manual:</p> <p>1TA</p> <p>1TB</p> <p>1TC</p> <p>1TD</p>	<p>Operator rotates the 1TA Mode Select Switch clockwise to MANUAL.</p> <p>Operator rotates the 1TB Mode Select Switch clockwise to MANUAL. Same</p> <p>Operator rotates the 1TC Mode Select Switch clockwise to MANUAL. Same</p> <p>Operator rotates the 1TD Mode Select Switch clockwise to MANUAL.</p>		
12	<p>(Step 9.b) Open the following breakers:</p> <p>1TA normal breaker</p> <p>1TA standby breaker</p> <p>1TB normal breaker</p> <p>1TB standby breaker</p> <p>1TC normal breaker</p> <p>1TC standby breaker</p> <p>1TD normal breaker</p> <p>1TD standby breaker</p>	<p>For each breaker, the Operator observes green status light lit for normal breaker and determines the breaker is open.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	(Step 9.c) Open all NC pump supply breakers.	<p>Operator observes the 1A NC Pump green breaker status light lit.</p> <p>Operator observes the 1B NC Pump green breaker status light lit.</p> <p>Operator observes the 1C NC Pump green breaker status light lit.</p> <p>Operator observes the 1D NC Pump green breaker status light lit.</p>		
*14	<p>(Step 9.d) Place the following pump switches to STOP:</p> <p>All hotwell pumps</p>	<p>Operator rotates the 1A Hotwell Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p> <p>Operator rotates the 1B Hotwell Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p> <p>Operator rotates the 1C Hotwell Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*15	<p>(Step 9.d) Place the following pump switches to STOP:</p> <p>All condensate booster pumps</p>	<p>Operator rotates the 1A Condensate Booster Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p> <p>Operator rotates the 1B Condensate Booster Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p> <p>Operator rotates the 1C Condensate Booster Pump Control Switch counter-clockwise to STOP, observes green breaker status light lit.</p>		
16	<p>(Step 9.e) Depress "STOP" on the following pumps:</p> <p>B RF pump</p>	<p>Operator observes the B RF Pump green breaker status light lit.</p>		
17	<p>(Step 9.e) Depress "STOP" on the following pumps:</p> <p>All C Heater Drain Tank pumps</p>	<p>Operator observes the 1C1 Heater Drain Tank Pump green breaker status light lit.</p> <p>Operator observes the 1C2 Heater Drain Tank Pump green breaker status light lit.</p> <p>Operator observes the 1C3 Heater Drain Tank Pump green breaker status light lit.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
18	(Step 9.e) Depress "STOP" on the following pumps: All Low Level Intake pumps.	Dispatch an NLO to verify that the LLI Pump breakers are OPEN. Cue: (Booth Instructor) NLO reports that the 1A, 1B and 1C LLI Pump breakers are OPEN.		
*19	(Step 9.f) Open the following breakers: 1ATC Feeder Breaker 1ATD Feeder Breaker	Operator presses the TRIP pushbutton for the 1ATC Feeder Breaker and observes green breaker status light lit. Operator presses the TRIP pushbutton for the 1ATD Feeder Breaker and observes green breaker status light lit.		
20	(Step 9.g) IF either of the following Unit 1 breakers are closed, THEN open breakers: SATA Feeder Breaker SATB Feeder Breaker	Dispatch NLO to check breaker position OR use OAC map EPB7KV. Cue: (Booth Instructor) NLO reports that the SATA Feeder Breaker is OPEN. Dispatch NLO to check breaker position OR use OAC map EPB7KV. Cue: (Booth Instructor) NLO reports that the SATB Feeder Breaker is OPEN.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 9.h) Ensure deenergized 600V equipment does not restart upon power restoration as follows: (Step 9.h.1) IF "BRG OIL PUMP/GSOB PUMP" is off, THEN place control switch to PULL TO LOCK".	Operator rotates Bearing Oil Pump control switch counter-clockwise to the STOP position, and then pulls switch out to TRIP PULLOUT.		
*22	(Step 9.h.2) Open "C PZR HTR GRP SUP BKR".	Operator presses OPEN pushbutton for C Pzr Heater Group Supply Breaker and observes green breaker status light lit.		
23	(Step 9.h.3) Place D Pzr heater in manual.	Operator rotates D Pzr Heater control switch clockwise to the MANUAL position.		
*24	(Step 9.h.4) Open D Pzr heater group supply breaker.	Operator presses TRIP pushbutton for D Pzr Heater Group Supply Breaker and observes green breaker status light lit.		
25	(Step 9.h.5) Place A RV pump in manual and off.	Operator presses the A RV Pump MANUAL pushbutton to release AUTO pushbutton, and presses STP pushbutton to release START pushbutton.		
26	(Step 9.h.6) Place B RV pump in manual and off.	Operator presses the B RV Pump MANUAL pushbutton to release AUTO pushbutton, and presses STP pushbutton to release START pushbutton.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
27	(Step 9.h.7) Depress manual and off on control switch for any RL pump that is off or deenergized.	<p>Operator presses the A RL Pump MANUAL pushbutton to release AUTO pushbutton, and presses STP pushbutton to release START pushbutton.</p> <p>Operator presses the B RL Pump MANUAL pushbutton to release AUTO pushbutton, and presses STP pushbutton to release START pushbutton.</p> <p>Operator presses the C RL Pump MANUAL pushbutton to release AUTO pushbutton, and presses STP pushbutton to release START pushbutton.</p>		
28	(Step 9.h.8) Depress "OFF" on control switch for any KR pump that is off or deenergized.	<p>Operator presses the A KR Pump OFF pushbutton.</p> <p>Operator presses the B KR Pump OFF pushbutton.</p> <p>Operator presses the C KR Pump OFF pushbutton.</p>		
29	(Step 9.h.9) Depress stop on all G heater drain tank pumps.	<p>Operator presses the STOP pushbutton for the 1G1 Heater Drain Tank Pump and observes green breaker status light lit.</p> <p>Operator presses the STOP pushbutton for the 1G2 Heater Drain Tank Pump and observes green breaker status light lit.</p> <p>Operator presses the STOP pushbutton for the 1G3 Heater Drain Tank Pump and observes green breaker status light lit.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
30	(Step 9.h.10) IF VP was in service prior to blackout, THEN place the "VP SUP & EXH FANS MODE" switch to "OFF".	Operator recognizes (After cue) that VP was NOT in service and proceeds to step 9.i. Cue: VP was not in service prior to the Blackout.		
31	(Step 9.i) Dispatch operator(s) to perform the following: Enclosure 11 (Preparing 6900V Busses for Power Restoration) Enclosure 12 (Preparing 600V Loads for Power Restoration).	Operator dispatches NLO to perform Enclosures 11 and 12. Cue: (Booth Instructor) The NLO has been dispatched.		
32	(Step 10) Ensure lockouts reset as required by Step 2.	Operator observes relay board. Cue: Lockout Relays are Reset.		
33	(Step 11) Do not continue until the following are completed: Steps 9 through 10 Enclosure 11 (Preparing 6900V Busses for Power Restoration) Enclosure 12 (Preparing 600V Loads for Power Restoration).	Operator contacts NLO to check status of Enclosure 11/12 completion. Cue: As NLO, report Enclosures 11/12 complete.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
34	(Step 12) Check the following MODs - CLOSED: MOD-8R MOD-8Y MOD-9R MOD-9Y MOD-11R MOD-11Y MOD-12R MOD-12Y	For each MOD, Operator observes red status light lit and determines the MOD is closed.		
35	(Step 13) Check switch indications for the following 6900V switchgear breakers - LIT: 1TA NORMAL BREAKER 1TA STDBY BREAKER 1TB NORMAL BREAKER 1TB STDBY BREAKER 1TC NORMAL BREAKER 1TC STDBY BREAKER 1TD NORMAL BREAKER 1TD STDBY BREAKER	For each Breaker, Operator observes green status light lit and determines the breaker is open.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
36	(Step 14) Energize 1ATA and 1ATB by closing available PCBs as directed by Toddville TCC.	Operator contacts Toddville and requests permission to close PCBs 8, 9, 11, and 12.		
		Cue: Toddville grants permission to Close PCBs 8, 9, 11, and 12.		
		Operator presses CLOSE pushbutton for PCB 8 and observes red status light lit.		
		Operator presses CLOSE pushbutton for PCB 9 and observes red status light lit.		
		Operator presses CLOSE pushbutton for PCB 11 and observes red status light lit.		
*	PCB 8	Operator presses CLOSE pushbutton for PCB 8 and observes red status light lit.		
*	PCB 9	Operator presses CLOSE pushbutton for PCB 9 and observes red status light lit.		
*	PCB 11	Operator presses CLOSE pushbutton for PCB 11 and observes red status light lit.		
*	PCB 12.	Operator presses CLOSE pushbutton for PCB 12 and observes red status light lit.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*37	(Step 15) Energize 6900V busses by closing normal or standby breaker on the following:			
	1TA	Operator presses CLOSE pushbutton for 1TA and observes red status light lit.		
	1TB	Operator presses CLOSE pushbutton for 1TB and observes red status light lit.		
	1TC	Operator presses CLOSE pushbutton for 1TC and observes red status light lit. (NOTE: Control Room lights will be restored with this action.)		
	1TD	Operator presses CLOSE pushbutton for 1TD and observes red status light lit.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems - Control Room JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A loss of all AC power has occurred on both Unit 1 and Unit 2.
- EP/1/A/5000/ECA-0.0 and EP/2/A/5000/ECA-0.0 have been implemented on their respective Units.
- On Unit 1 the 1A Diesel Generator has tripped on a loss of lube oil, and the 1B Diesel Generator has tripped on overspeed.
- Both train A and B sequencer control power breakers have been opened.
- The Dispatcher has informed you that offsite power can now be restored.

INITIATING CUE:

The CRSRO has directed you to restore power to the Unit 1 6900 Volt Buses using Offsite Power per EP/1/A/5000/ECA-0.0 Enclosure 8.

In Plant JPM I

PERFORMANCE INFORMATION

Facility: McGuire Task No.:

Task Title: Emergency Borate the Reactor Coolant System Locally Using 2NV-269 JPM No.: 2008 Systems – In Plant JPM I

K/A Reference: 004 A2.14 3.8/3.9

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Unit 2 was at 100% power when a Boron dilution event occurred.
- AP/2/A/5500/38 (Emergency Boration) was entered.
- While attempting to open 2NV-265B (Boric Acid To NV Pumps), the RO discovered that 2NV-265B was de-energized.

Task Standard: 2NV-269 is located and manually opened (simulated) within ten (10) minutes. All critical tasks evaluated as satisfactory.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, etc.)
Dosimetry

General References: AP/2/A/5500/38 Emergency Boration

Handouts: None

Initiating Cue: The CRSRO has directed you to emergency borate the NC System by locally opening 2NV-265B (Boric Acid To NV Pumps). Notify the control room when the valve is opened.

PERFORMANCE INFORMATION

Time Critical Task: YES (10 minutes) – Required by PT/0/A/4600/113, “Operator Time Critical Task Verification,” Enclosure 13.4, “Stop Dilution and Borate During a Dilution Event.”

Validation Time: 8 minutes

NOTE: Start this JPM from the hallway outside of the Operations kitchen.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 11.d RNO) Perform the following: (Step 11.d RNO 1) Dispatch operator to open 2NV-265B (aux bldg, 733+3, JJ-54, near chemical addition tank).	Operator locates 2NV-265B and attempts to open it (simulated). Cue: Give the following cue <u>as soon as</u> the operator begins to describe opening the valve: Handwheel clutch engaged Force applied in the counter clockwise direction Handwheel is <u>NOT</u> moving Operator recognizes that valve cannot be opened and calls Control Room. Cue: The Control Room operator directs you to unlock and open 2NV-269 (Boric Acid Supply to NV Pumps Block) in accordance with Step 11.d RNO 11.d.2.a) of AP/2/A/5500/38. Notify the C/R when the valve is open.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	(Step 11.d RNO 2) IF 2NV-265B can not be opened, THEN:	Operator locates 2NV-269, then unlocks and opens it (simulated) within ten minutes of dispatch.		
*	(Step 11.d RNO 2.a) Dispatch operator to unlock and open 2NV-269 (BA Supply to NV Pumps Block) (aux bldg, 733+4, JJ-54, near chemical addition tank).	Cue: Lock removed, Handwheel rotated fully counter- clockwise.		
		The operator calls the Control Room and reports that 2NV- 269 is OPEN.		
		Cue: The Control Room operator understands that 2NV-269 is open.		
3	(Step 11.d RNO 2.b) Open 2NV-267A (Boric Acid To Blender Control).	The operator calls the Control Room and requests that the BOP Open 2NV-267A.		
		Cue: Terminate the JPM.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

TIME CRITICAL STOP TIME _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems – In Plant JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 2 was at 100% power when a Boron dilution event occurred.
- AP/2/A/5500/38 (Emergency Boration) was entered.
- While attempting to open 2NV-265B (Boric Acid To NV Pumps), the RO discovered that 2NV-265B was de-energized.

INITIATING CUE:

The CRSRO has directed you to emergency borate the NC System by locally opening 2NV-265B (Boric Acid To NV Pumps). Notify the control room when the valve is opened.

This is a Time Critical Task.

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

In Plant JPM J

Facility: McGuire Task No.: MO-5012

Task Title: Ensure Proper Response of Diesel VI Compressors on Loss of VI JPM No.: 2008 Systems – In Plant JPM J (A)

K/A Reference: APE 065 AA1.04 3.5/3.4

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Units 1 and 2 are at 100% power when a leak develops in the VI system.
- AP/1/A/5500/22, "Loss of VI," has been implemented up to step 4.c.
- VI header pressure is 75 PSIG and going down.

Task Standard: "G" VI compressor is started per Enclosure 4 (Diesel VI Compressor Operation) of AP/1/A/5500/22. All critical tasks evaluated as satisfactory.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, etc.)

General References: AP/1/A/5500/22 LOSS OF VI

Handouts: AP/1/A/5500/22 LOSS OF VI

Initiating Cue:

- Ensure Diesel VI compressors are running per Enclosure 4 (Diesel VI Compressor Operation) of AP/1/A/5500/22.
- Use the copy of the procedure located on column 2B32, Unit 2 TB, near exit door leading to Diesel VI compressors.

Time Critical Task: NO

Validation Time: 7 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and when candidate attempts to obtain procedure located on column 2B32, Unit 2 TB, near exit door leading to Diesel VI compressors, Handout AP/1/A/5500/22.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
NA		<p>Cue:</p> <p>Upon arriving at the scene, the following conditions exist:</p> <ul style="list-style-type: none"> • H VI Compressor is running. • G VI Compressor is <u>NOT</u> running. 		
1	<p>(Step 1) On running compressors, ensure associated compressor switches are in the following positions:</p> <p>"Auto/Off-Reset" selector switch in "AUTO".</p> <p>"HIGH/LOW " selector switch, in "HIGH".</p> <p>"START/WARM-UP/RUN" selector switch in "RUN".</p>	<p>Operator proceeds to check the switches for "H" VI Compressor.</p> <p>Cue:</p> <p>As operator checks each switch:</p> <ul style="list-style-type: none"> • "Auto/Off-Reset" selector switch is in "AUTO" • "HIGH/LOW " selector switch is in "HIGH". • "START/WARM-UP/RUN" switch is in "RUN". 		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	(Note prior to Step 2) Several G and H VI Compressor gauges will not function until the associated "Engine Switch" is placed in the ON position in the following steps.	Operator reads NOTE.		
*3	(Step 2) IF G VI Compressor is off, THEN perform the following: (Step 2.a) Place the "Auto/Off-Reset" selector switch in "OFF-RESET."	Operator places the "Auto/Off-Reset" selector switch in "OFF-RESET." (Simulated) (AS FOUND = AUTO) Cue: "Auto/Off-Reset" rotary switch moved to "OFF- RESET."		
4	(Step 2.b) Ensure the "HIGH/LOW" selector switch, is in "HIGH."	Operator ensures the "HIGH/LOW" selector switch, is in "HIGH." (Simulated) (AS FOUND = HIGH) Cue: "HIGH/LOW" selector switch is in "HIGH."		
5	(Step 2.c) Ensure the "START/WARM-UP/RUN" selector switch is in "RUN."	Operator ensures the "START/WARM-UP/RUN" selector switch is in "RUN." (Simulated) (AS FOUND = RUN) Cue: "START/WARM-UP/RUN" switch is in "RUN."		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Note prior to Step 2.d) Engine will start after a 5 to 10 second time delay in next step.	Operator reads NOTE.		
7	(Step 2.d) Place "ENGINE SWITCH" in "ON."	Operator places the "ENGINE SWITCH" in "ON." (Simulated) Cue: "ENGINE SWITCH" rotated clockwise to "ON." 15 seconds have elapsed and the engine is <u>NOT</u> running.		
		(Alternate Path)		
*8	(Step 2.e) IF Diesel compressor fails to start within approximately 15 seconds, THEN perform the following: (Step 2.e.1)) Place "Engine" switch in "OFF".	Operator places the "ENGINE SWITCH" in "OFF." (Simulated) Cue: "Engine" switch rotated counterclockwise to "OFF."		
9	(Step 2.e.2)) Do not attempt to start G VI compressor until 2 minutes have elapsed.	Operator waits 2 minutes. Note: Allow the next two steps to be read before giving the "2 minutes have elapsed" cue. Cue: Two minutes have elapsed.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(Step 2.e.3)) <u>IF</u> H VI compressor is off, <u>THEN</u> start H VI compressor <u>PER</u> step 3 while waiting to start G VI compressor.	Operator will N/A this step and continue.		
11	(Step 2.e.4)) <u>WHEN</u> 2 minutes have elapsed, <u>THEN</u> observe note prior to Step 2.d and <u>RETURN TO</u> Step 2.d.	Operator will proceed to step 2.d.		
*12	(Step 2.d) Place "ENGINE SWITCH" in "ON".	Operator places the "ENGINE SWITCH" in "ON." (Simulated) Cue: "ENGINE SWITCH" rotated clockwise to "ON" and the engine is running.		
13	(Step 2.d) <u>IF</u> H VI compressor is off, <u>THEN</u> perform the following...	Operator determines that "H" VI Compressor is running and proceeds to step 4.		
14	(Step 2.d) <u>WHEN</u> time allows, <u>THEN</u> check running parameters <u>PER</u> OP/0/A/6450/005 (Instrument Air system), Enclosure 4.12 (Response to Auto/Emergency Start of G and/or H VI Compressor).	Operator proceeds to Enclosure 4.12. Cue: Another operator will check the running parameters when time allows.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Units 1 and 2 are at 100% power when a leak develops in the VI system.
- AP/1/A/5500/22, "Loss of VI," has been implemented up to step 4.c.
- VI header pressure is 75 PSIG and going down.

INITIATING CUE:

- Ensure Diesel VI compressors are running per Enclosure 4 (Diesel VI Compressor Operation) of AP/1/A/5500/22.
- Use the copy of the procedure located on column 2B32, Unit 2 TB, near exit door leading to Diesel VI compressors.

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

In Plant JPM K

Facility: McGuire Task No.:

Task Title: Establish NC Pump Seal Injection from the SSF JPM No.: 2008 Systems – In Plant JPM K

K/A Reference: EPE 055 EK3.02 4.3/4.6

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____
 Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The SRO has dispatched one (1) operator to 1ETA to swap 1EMXA4.

Task Standard: SSF Diesel in operation and supplying power to 1SLXG. 1SLXG is supplying power to SMXG and SMXG-1. Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed. Standby makeup pump is supplying NCP seal injection within 8 minutes. All critical tasks evaluated as satisfactory.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, etc.)

General References: EP/1/A/5000/ECA-0.0 Loss of All AC Power

Handouts: EP/1/A/5000/ECA-0.0, Enclosure 1

Initiating Cue: Obtain the Brown Folder at SSF and complete Enclosure 1 (Unit 1 SSF-ECA-0.0 Actions)

Time Critical Task: YES (Re-establishing Seal Water flow of 26 gpm in accordance with Step 5.e of Enclosure must be completed within 8 minutes as indicated by PT/0/A/4600/113, "Operator Time Critical Task Verification," Enclosure 13.11, "Initiate SSF NCP Seal Injection and Swap to the SSF.")

This JPM should be timed starting from the OPS Kitchen. Once flow from the standby makeup pump is verified, the "critical time" stops.

Validation Time: 15 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and after the enclosure is located at the SSF Handout EP/1/A/5000/ECA-0.0, Enclosure 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 1) At SSF D/G Control Panel: (Step 1.a) Check "LINE VOLTS" – APPROXIMATELY 600V.	Operator checks line voltage.		
		Cue: Meter reads "0" Volts.		
2	(Step 1.a RNO) <u>GO TO</u> Step 1.c.	Operator goes to Step 1.c.		
*3	(Step 1.c) Place "SSF DIESEL TEST/EMERG" switch to "EMER"	Operator rotates "SSF DIESEL TEST/EMERG" switch clockwise to "EMER" (Simulated)		
		Cue: Switch rotated clockwise to EMER position.		
4	(Step 1.d) Check "SSF DIESEL START CONTROL" switch - "OFF"	Operator checks "SSF DIESEL START CONTROL" switch in OFF.		
		Cue: Switch is in "OFF" position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 1.e) Place "SSF DIESEL START CONTROL" switch to "ON"	Operator places "SSF DIESEL START CONTROL" switch to ON. (Simulated)		
		Cue: Switch is rotated clockwise to "ON" position.		
6	(Step 1.f) Check D/G starts within 30 seconds	Operator observes Diesel condition.		
		Cue: Background noise level has increased, various gage indications are up.		
*7	(Step 1.g) Depress "TRIP" for "NORMAL INCOMING BREAKER CONTROL"	Operator presses "TRIP" for "NORMAL INCOMING BREAKER CONTROL." (Simulated)		
		Cue: Pushbutton depressed, green lamp is illuminated.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	<p>(Step 2) At 1SLXG:</p> <p>(Step 2.a) Open all 600 V load center breakers:</p>	<p>Operator proceeds to Load Center 1SLXG and opens any breakers that are closed. (Simulated)</p> <p>Note: The BMXA feeder breaker is normally open and is not a critical step.</p> <ul style="list-style-type: none"> • 600V MCC BMXA NORMAL INCOMING FEEDER • 600V MCC SMXG • 600V MCC SMXG-1 • MOTOR CONTROL CENTER 1EMXH-1 ALTERNATE FEEDER • SSF STDBY BATTERY CHARGER SDSS <p>Cue (As Applicable):</p> <p>Switches rotated counterclockwise or trip pushbuttons depressed, green lamps are illuminated.</p>		
*9	<p>(Step 3) At SMXG-1:</p> <p>(Step 3.a) Open the following breakers:</p> <p>SMXG1-FAE (SDSP1 Battery Charger)</p> <p>SMXG1-RAD (SDSP2 Battery Charger)</p>	<p>Operator proceeds to Load Center 1SMXG-1 and opens breakers. (Simulated)</p> <p>Cue (As Applicable):</p> <p>Breaker handle moved down.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	(Step 4) At 1SLXG: (Step 4.a) Depress "CLOSE" on 600 V load center breaker 1SLXG-5B (SSF D/G) (on breaker)	Operator proceeds to Load Center 1SMXG-1 and opens breakers. (Simulated) Cue (As Applicable): Pushbutton depressed and breaker indicates closed.		
11	(Step 4.b) Using pistol grip switches, close the following breakers * (Step 4.b.1) Close "1SLXG-5C CS" (SMXG1 MCC (Normal) Feeder Cntrl Switch). (Step 4.b.2) Wait 10 Seconds * (Step 4.b.3) Close "1SLXG-4C CS" (SMXG MCC (Normal) Feeder Cntrl Switch).	Operator proceeds to Load Center 1SLXG-5C and closes breaker. (Simulated) Cue: Pistol grip rotated clockwise, red light is illuminated. Operator waits 10 seconds. Operator proceeds to Load Center 1SLXG-4C and closes breaker. (Simulated) Cue: Pistol grip rotated clockwise, red light is illuminated.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*12	(Step 5) At SSF Control Panel: (Step 5.a) Open the following valves: Open 1NV-842AC (Standby M/U Pump Suction Isol) Open 1NV-849AC (Standby M/U Pump Cont Outside Isol)	Operator opens valves by depressing OPEN pushbutton, observes Red status light LIT. (Simulated) Cue: Pushbutton depressed, red light is illuminated.		
13	(Step 5.b) Check 1NV-1013C (Standby M/U Pump to NC Pump Seals Isol) – OPEN	Operator observes Red status light LIT. Cue: Red light is illuminated.		
*14	(Step 5.c) Close 1NV-94AC (NC Pumps Seal Ret Cont Inside Isol)	Operator closes valve by depressing CLOSED pushbutton, observes Green status light LIT. (Simulated) Cue: Pushbutton depressed, Green light is illuminated.		
*15	(Step 5.d) Start Unit 1 Standby Makeup Pump.	Operator starts pump by depressing START pushbutton, observes Red status light LIT. (Simulated) Cue: Pushbutton depressed, Red light is illuminated.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	(Step 5.e) Check Unit 1 Standby Makeup Pump flow (1NVP6420) - GREATER THAN OR EQUAL TO 26 GPM.	Operator observes meter Cue: Meter indicates 28 gpm. Stop Time for Time Critical Task: -----		
17	(Step 5.f) Check 1NV-1012C (Standby M/U Pump to Cont Sump) - CLOSED	Operator observes Green status light LIT. Cue: Green light is illuminated.		
18	(Step 5.g) Check SSF D/G - RUNNING	Operator observes Diesel condition. Cue: Background noise level is heard, various gage indications are up.		
19	(Step 5.h) Check SSF D/G "FREQUENCY" - AT 60 Hz.	Operator observes meter. Cue: Meter indicates 60 Hz.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
20	(Step 5.i) Check SSF D/G "VOLTAGE" – AT 600V.	Operator observes meter. Cue: Meter indicates 600 Volts.		
21	(Step 6) At SMXG-1: * (Step 6.a) Close SMXG1 - FAE (SDSP1 BATTERY CHARGER) (Step 6.b) Wait 10 Seconds * (Step 6.c) Close SMXG-1 - RAD (SDSP2 BATTERY CHARGER) (Step 6.d) Wait 10 Seconds	Operator proceeds to Load Center SMXG-FAE and closes breaker. (Simulated) Cue: Breaker handle pulled into the UP position. Operator waits 10 seconds. Operator proceeds to Load Center SMXG-1-RAD and closes breaker. (Simulated) Cue: Breaker handle pulled into the UP position. Operator waits 10 seconds.		
22	(Step 7) At 1SLXG: (Step 7.a) Using pistol grip switch, close "1SLXG-5D CS" (SDSS Battery Charger Cntrl Switch). (Step 7.b) Wait 10 Seconds	Operator proceeds to Load Center SLXG-5D and closes breaker. (Simulated) Cue: Pistol grip rotated clockwise, red light is illuminated. Operator waits 10 seconds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	(Step 8) At SMXG: (Step 8.a) Ensure SMXG-F5A (Unit 1 Pzr Heaters 28/55/56 Feeder) is closed.	Operator observes breaker position.		
		Cue: Breaker is closed.		
24	(Step 9) At SSF Control Panel: (Step 9.a) Check SSF D/G "FREQUENCY" - AT 60 Hz	Operator observes SSF D/G Frequency Meter.		
		Cue: Meter indicates 60 Hz.		
	(Step 9.b) Check SSF D/G "VOLTAGE" – AT 600V.	Operator observes SSF D/G Voltage Meter.		
		Cue: Meter indicates 600 volts.		
	(Step 9.c) Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW	Operator observes SSF Generator Load Meter.		
		Cue: Meter indicates 500 KW.		
25	(Step 10) Ensure SSF D/G room intake louvers are open (located above rollup doors in D/G room).	Operator observes SSF D/G room intake louvers position.		
		Cue: Intake louvers are open.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
26	<p>(Step 11) <u>IF AT ANY TIME</u> SSF D/G trips without apparent cause, <u>OR</u> is unable to be started without apparent cause, <u>THEN</u>:</p> <p>(Step 11.a) Ensure "GENERATOR BREAKER CONTROL" indicates "OPEN"</p> <p>(Step 11.b) Ensure the "SSF DIESEL START CONTROL" switch is in "OFF"</p> <p>(Step 11.c) Turn the manual knob on the "FUEL OIL SOLENOID BYPASS" (located on the SSF control room side of D/G, 3 ft from floor) fully clockwise</p> <p>(Step 11.d) RETURN TO Step 1.e.</p>	<p>Operator observes Diesel condition.</p> <p>Cue:</p> <p>Background noise level is heard, various gage indications are up.</p> <p>Operator returns to Step 1.e</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2008 Systems – In Plant JPM K

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The SRO has dispatched one (1) operator to 1ETA to swap 1EMXA4.

INITIATING CUE:

Obtain the Brown Folder at SSF and complete Enclosure 1 (Unit 1 SSF-ECA-0.0 Actions)

This is a Time Critical Task.

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.