

**Final Submittal**  
(Blue Paper)

**FINAL SRO  
WRITTEN EXAMINATION  
AND REFERENCES**

**HATCH DECEMBER 2007 EXAM  
05000321/2007301 AND 05000366/2007301**

**DECEMBER 3 - 6, 2007, AND  
DECEMBER 10, 2007, (WRITTEN)**

SRD KEY

# Pearson NCS Test Sheet 100/W

Form No. 95677

Reorder Form No. 95677

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Fax 1-507-451-4513

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FEED IN THIS DIRECTION

FEED IN THIS DIRECTION

KEY ID  
A B C D

SCORING & PRINTING OPTIONS:  
☐ RESCORE ☐ MULTIPLE ANSWER SCORING  
☐ CORRECT ANSWER ☐ MARK X ☐ TOTAL ONLY  
 MARK ONLY ONE

T F  
 1 A B C D E  
 2 A B C D E  
 3 A B C D E  
 4 A B C D E  
 5 A B C D E  
 6 A B C D E  
 7 A B C D E  
 8 A B C D E  
 9 A B C D E  
 10 A B C D E  
 11 A B C D E  
 12 A B C D E  
 13 A B C D E  
 14 A B C D E  
 15 A B C D E  
 16 A B C D E  
 17 A B C D E  
 18 A B C D E  
 19 A B C D E  
 20 A B C D E  
 21 A B C D E  
 22 A B C D E  
 23 A B C D E  
 24 A B C D E  
 25 A B C D E

T F  
 26 A B C D E  
 27 A B C D E  
 28 A B C D E  
 29 A B C D E  
 30 A B C D E  
 31 A B C D E  
 32 A B C D E  
 33 A B C D E  
 34 A B C D E  
 35 A B C D E  
 36 A B C D E  
 37 A B C D E  
 38 A B C D E  
 39 A B C D E  
 40 A B C D E  
 41 A B C D E  
 42 A B C D E  
 43 A B C D E  
 44 A B C D E  
 45 A B C D E  
 46 A B C D E  
 47 A B C D E  
 48 A B C D E  
 49 A B C D E  
 50 A B C D E

T F  
 51 A B C D E  
 52 A B C D E  
 53 A B C D E  
 54 A B C D E  
 55 A B C D E  
 56 A B C D E  
 57 A B C D E  
 58 A B C D E  
 59 A B C D E  
 60 A B C D E  
 61 A B C D E  
 62 A B C D E  
 63 A B C D E  
 64 A B C D E  
 65 A B C D E  
 66 A B C D E  
 67 A B C D E  
 68 A B C D E  
 69 A B C D E  
 70 A B C D E  
 71 A B C D E  
 72 A B C D E  
 73 A B C D E  
 74 A B C D E  
 75 A B C D E

T F  
 76 A B C D E  
 77 A B C D E  
 78 A B C D E  
 79 A B C D E  
 80 A B C D E  
 81 A B C D E  
 82 A B C D E  
 83 A B C D E  
 84 A B C D E  
 85 A B C D E  
 86 A B C D E  
 87 A B C D E  
 88 A B C D E  
 89 A B C D E  
 90 A B C D E  
 91 A B C D E  
 92 A B C D E  
 93 A B C D E  
 94 A B C D E  
 95 A B C D E  
 96 A B C D E  
 97 A B C D E  
 98 A B C D E  
 99 A B C D E  
 100 A B C D E

ANSWER KEY INFO.  
 # OF KEYS  
 ITEM COUNT  
 0 0 0 2  
 1 1 1 3  
 2 2 4  
 3 3  
 4 4  
 5 5  
 6 6  
 7 7  
 8 8  
 9 9

PERFORMANCE ASSESSMENT  
 % OF TOTAL SCORE  
 00 = 100%  
 E  
Q  
U  
A  
L  
P  
T  
V  
A  
L  
U  
E  
 0 0 0 0 0  
 1 1 1 1 1  
 2 2 2 2 2  
 3 3 3 3 3  
 4 4 4 4 4  
 5 5 5 5 5  
 6 6 6 6 6  
 7 7 7 7 7  
 8 8 8 8 8  
 9 9 9 9 9

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Bar Code

NUMBER CORRECT  
 PERCENT CORRECT  
 ROSTER NUMBER  
 SCORE  
 RESCORE



COMBINED POINTS EARNED  
 COMBINED PERCENT CORRECT  
 LETTER GRADE  
 SCORE  
 RESCORE



## MARKING INSTRUCTIONS



Use a No. 2 Pencil

A B C D E

Fill oval completely

A B C D E

Erase cleanly

STUDENT ID NUMBER  
 0 0 0 0 0 0 0 0 0 0  
 1 1 1 1 1 1 1 1 1 1  
 2 2 2 2 2 2 2 2 2 2  
 3 3 3 3 3 3 3 3 3 3  
 4 4 4 4 4 4 4 4 4 4  
 5 5 5 5 5 5 5 5 5 5  
 6 6 6 6 6 6 6 6 6 6  
 7 7 7 7 7 7 7 7 7 7  
 8 8 8 8 8 8 8 8 8 8  
 9 9 9 9 9 9 9 9 9 9

NAME  
 SUBJECT  
 PERIOD DATE

SRO KEY

# Pearson NCS Test Sheet 100/W

1

Form No. 95677

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Fax 1-507-451-4513  
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ANSWER KEY INFO.			
# OF KEYS			
ITEM COUNT			
0	0	0	2
1	1	1	3
2	2	2	4
3	3	3	5
4	4	4	6
5	5	5	7
6	6	6	8
7	7	7	9
8	8	8	9
9	9	9	9

PERFORMANCE ASSESSMENT									
% OF TOTAL SCORE					POINTS EARNED				
100 = 100%									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

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Bar Code

100  
ITEM

## MARKING INSTRUCTIONS

Use a No. 2 Pencil

A ● C D E  
Fill oval completely

A B C D E  
Erase cleanly

STUDENT ID NUMBER									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

KEY ID  
A B C D

SCORING & PRINTING  
OPTIONS:

☐ RESCORE

☐ MULTIPLE ANSWER SCORING

☐ CORRECT ANSWER

☐ MARK X

☐ TOTAL ONLY

MARK ONLY ONE

FEED IN THIS DIRECTION

T	F
1	A B C D E
2	A B C D E
3	A B C D E
4	A B C D E
5	A B C D E
6	A B C D E
7	A B C D E
8	A B C D E
9	A B C D E
10	A B C D E
11	A B C D E
12	A B C D E
13	A B C D E
14	A B C D E
15	A B C D E
16	A B C D E
17	A B C D E
18	A B C D E
19	A B C D E
20	A B C D E
21	A B C D E
22	A B C D E
23	A B C D E
24	A B C D E
25	A B C D E

T	F
26	A B C D E
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29	A B C D E
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33	A B C D E
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35	A B C D E
36	A B C D E
37	A B C D E
38	A B C D E
39	A B C D E
40	A B C D E
41	A B C D E
42	A B C D E
43	A B C D E
44	A B C D E
45	A B C D E
46	A B C D E
47	A B C D E
48	A B C D E
49	A B C D E
50	A B C D E

T	F
51	A B C D E
52	A B C D E
53	A B C D E
54	A B C D E
55	A B C D E
56	A B C D E
57	A B C D E
58	A B C D E
59	A B C D E
60	A B C D E
61	A B C D E
62	A B C D E
63	A B C D E
64	A B C D E
65	A B C D E
66	A B C D E
67	A B C D E
68	A B C D E
69	A B C D E
70	A B C D E
71	A B C D E
72	A B C D E
73	A B C D E
74	A B C D E
75	A B C D E

T	F
76	A B C D E
77	A B C D E
78	A B C D E
79	A B C D E
80	A B C D E
81	A B C D E
82	A B C D E
83	A B C D E
84	A B C D E
85	A B C D E
86	A B C D E
87	A B C D E
88	A B C D E
89	A B C D E
90	A B C D E
91	A B C D E
92	A B C D E
93	A B C D E
94	A B C D E
95	A B C D E
96	A B C D E
97	A B C D E
98	A B C D E
99	A B C D E
100	A B C D E

FEED IN THIS DIRECTION

NUMBER CORRECT	
PERCENT CORRECT	
ROSTER NUMBER	
SCORE	
RESCORE	

PEARSON  
NCS

COMBINED POINTS EARNED	
COMBINED PERCENT CORRECT	
LETTER GRADE	
SCORE	
RESCORE	

NAME

SUBJECT

PERIOD

DATE

# 2007 NRC SRO EXAM

Answers			
#	ID	Points	0
1	201002K1.04 1	1.00	D (1.00)
2	202001A2.07 2	1.00	A (1.00)
3	202002K4.03 1	1.00	B (1.00)
4	203000K2.02 2	1.00	C (1.00)
5	205000K3.01 1	1.00	D (1.00)
6	206000A1.01 1	1.00	A (1.00)
7	206000K5.06 1	1.00	A (1.00)
8	209001G2.1.31 1	1.00	B (1.00)
9	211000K2.01 1	1.00	A (1.00)
10	212000K2.02 1	1.00	B (1.00)
11	212000K4.07 1	1.00	A (1.00)
12	215003K4.06 1	1.00	A (1.00)
13	215004A1.01 1	1.00	D (1.00)
14	215005K3.08 1	1.00	A (1.00)
15	217000A3.03 1	1.00	D (1.00)
16	218000K6.02 1	1.00	A (1.00)
17	219000A3.01 1	1.00	A (1.00)
18	223002A2.09 2	1.00	D (1.00)
19	223002K3.01 2	1.00	C (1.00)
20	230000A4.03 1	1.00	B (1.00)
21	233000G2.4.50 2	1.00	B (1.00)
22	239002G2.4.22 1	1.00	A (1.00)
23	245000K3.05 1	1.00	A (1.00)
24	259001K3.08 1	1.00	C (1.00)
25	259002K4.10 1	1.00	B (1.00)
26	259002K6.01 1	1.00	A (1.00)
27	261000A1.05 2	1.00	C (1.00)
28	262001A2.03 1	1.00	A (1.00)
29	262002K3.15 1	1.00	A (1.00)
30	263000G2.1.29 3	1.00	D (1.00)
31	264000A4.05 1	1.00	C (1.00)
32	264000K3.01 1	1.00	D (1.00)
33	271000K5.06 1	1.00	B (1.00)
34	272000G2.2.30 1	1.00	B (1.00)
35	288000K1.03 1	1.00	D (1.00)
36	290001K1.07 1	1.00	A (1.00)
37	295001AK1.01 1	1.00	A (1.00)
38	295003AA1.04 2	1.00	B (1.00)
39	295004AA2.04 3	1.00	A (1.00)
40	295005AK3.03 4	1.00	A (1.00)
41	295006AK1.01 5	1.00	C (1.00)
42	295007AA2.01 21	1.00	A (1.00)
43	295012AK3.01 1	1.00	A (1.00)
44	295013AK1.03 1	1.00	D (1.00)
45	295014G2.1.30 1	1.00	D (1.00)
46	295015AK2.08 1	1.00	A (1.00)
47	295016AA1.06 6	1.00	D (1.00)
48	295017AK1.02 1	1.00	C (1.00)

# 2007 NRC SRO EXAM

Answers			
#	ID	Points	0
49	295018AK2.02 7	1.00	A (1.00)
50	295019AK2.11 8	1.00	D (1.00)
51	295021AK2.07 1	1.00	A (1.00)
52	295022AK2.07 1	1.00	A (1.00)
53	295023AK2.01 10	1.00	B (1.00)
54	295024EK1.01 11	1.00	D (1.00)
55	295025EK1.03 12	1.00	A (1.00)
56	295026EK2.03 15	1.00	D (1.00)
57	295026G2.4.23 13	1.00	C (1.00)
58	295028EK2.01 15	1.00	C (1.00)
59	295030EK1.01 16	1.00	C (1.00)
60	295031G2.4.45 17	1.00	D (1.00)
61	295037EA1.07 19	1.00	D (1.00)
62	295038EK1.03 19	1.00	B (1.00)
63	300000K4.02 1	1.00	D (1.00)
64	400000K3.01 1	1.00	D (1.00)
65	600000AK2.01 20	1.00	D (1.00)
66	G2.1.2 1	1.00	C (1.00)
67	G2.1.25 1	1.00	B (1.00)
68	G2.2.11 1	1.00	B (1.00)
69	G2.2.27 1	1.00	C (1.00)
70	G2.2.4 1	1.00	C (1.00)
71	G2.3.10 1	1.00	A (1.00)
72	G2.3.2 1	1.00	C (1.00)
73	G2.4.29 1	1.00	B (1.00)
74	G2.4.45 1	1.00	D (1.00)
75	G2.4.7 1	1.00	C (1.00)
76	201003A2.05 1	1.00	A
77	204000G2.1.2 1	1.00	B
78	211000G2.1.14 2	1.00	A
79	212000A2.20 1	1.00	A
80	215004A2.02 3	1.00	A
81	245000A2.07 1	1.00	C
82	262001A2.08 3	1.00	D
83	295003AA2.04 1	1.00	A
84	295004AA2.02 1	1.00	C
85	295014G2.4.31 1	1.00	D
86	295020AA2.04 1	1.00	B
87	295025EA2.06 1	1.00	D
88	295026G2.1.28 1	1.00	C
89	295028EA2.06 1	1.00	D
90	295033G2.4.50 1	1.00	B
91	295038G2.2.22 1	1.00	B
92	400000A2.03 1	1.00	B
93	600000G2.4.29 1	1.00	B
94	G2.1.14 1	1.00	A
95	G2.1.7 1	1.00	A
96	G2.2.19 1	1.00	D

# 2007 WRC SRO EXAM

Answers			
#	ID	Points	0
97	G2.2.34 2	1.00	C
98	G2.3.9 1	1.00	B
99	G2.4.11 1	1.00	A
100	G2.4.26 1	1.00	B

## License Class HLT-03

Hatch 2007 SRO Initial Exam - Written

Given on 12/10/2007

100.00 Total Points

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
P						
201002K1.04 1						
1	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
202001A2.07 2						
2	5	0	4	1	0	0
	0.80	0.00	0.80	0.20	0.00	0.00
202002K4.03 1						
3	5	0	0	3	2	0
	0.60	0.00	0.00	0.60	0.40	0.00
203000K2.02 2						
4	5	0	1	0	4	0
	0.80	0.00	0.20	0.00	0.80	0.00
205000K3.01 1						
5	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
206000A1.01 1						
6	5	0	3	2	0	0
	0.60	0.00	0.60	0.40	0.00	0.00
206000K5.06 1						
7	5	0	4	0	0	1
	0.80	0.00	0.80	0.00	0.00	0.20
209001G2.1.31 1						
8	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00
211000K2.01 1						
9	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
212000K2.02 1						
10	5	0	0	4	0	1
	0.80	0.00	0.00	0.80	0.00	0.20

Overall		Omits	A (True)	B (False)	C	D
Item	Admins					
P						
212000K4.07 1						
11	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
215003K4.06 1						
12	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
215004A1.01 1						
13	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
215005K3.08 1						
14	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
217000A3.03 1						
15	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
218000K6.02 1						
16	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
219000A3.01 1						
17	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
223002A2.09 2						
18	5	0	0	1	3	1
	0.20	0.00	0.00	0.20	0.60	0.20
223002K3.01 2						
19	5	0	0	1	4	0
	0.80	0.00	0.00	0.20	0.80	0.00
230000A4.03 1						
20	5	0	0	3	0	2
	0.60	0.00	0.00	0.60	0.00	0.40
233000G2.4.50 2						
21	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00



Overall		Omits	A (True)	B (False)	C	D
Item	Admins					
p						
239002G2.4.22 1						
22	5	0	3	2	0	0
	0.60	0.00	0.60	0.40	0.00	0.00
245000K3.05 1						
23	5	0	2	0	1	2
	0.40	0.00	0.40	0.00	0.20	0.40
259001K3.08 1						
24	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
259002K4.10 1						
25	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00
259002K6.01 1						
26	5	0	4	0	1	0
	0.80	0.00	0.80	0.00	0.20	0.00
261000A1.05 2						
27	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
262001A2.03 1						
28	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
262002K3.15 1						
29	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
263000G2.1.29 3						
30	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
264000A4.05 1						
31	5	0	5	0	0	0
	0.00	0.00	1.00	0.00	0.00	0.00
264000K3.01 1						
32	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00

Overall		Omits	A (True)	B (False)	C	D
Item	Admins					
P						
271000K5.06 1						
33	5	0	2	2	1	0
	0.40	0.00	0.40	0.40	0.20	0.00
272000G2.2.30 1						
34	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00
288000K1.03 1						
35	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00
290001K1.07 1						
36	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
295001AK1.01 1						
37	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
295003AA1.04 2						
38	5	0	0	4	1	0
	0.80	0.00	0.00	0.80	0.20	0.00
295004AA2.04 3						
39	5	0	3	0	2	0
	0.60	0.00	0.60	0.00	0.40	0.00
295005AK3.03 4						
40	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
295006AK1.01 5						
41	5	0	2	0	3	0
	0.60	0.00	0.40	0.00	0.60	0.00
295007AA2.01 21						
42	5	0	3	2	0	0
	0.60	0.00	0.60	0.40	0.00	0.00
295012AK3.01 1						
43	5	0	4	0	0	1
	0.80	0.00	0.80	0.00	0.00	0.20

Overall		Omits A (True)		B (False)		C	D
Item	Admins						
P							
295013AK1.03 1							
44	5	0	0	0	0	5	
	1.00	0.00	0.00	0.00	0.00	1.00	
295014G2.1.30 1							
45	5	0	0	0	1	4	
	0.80	0.00	0.00	0.00	0.20	0.80	
295015AK2.08 1							
46	5	0	5	0	0	0	
	1.00	0.00	1.00	0.00	0.00	0.00	
295016AA1.06 6							
47	5	0	0	0	1	4	
	0.80	0.00	0.00	0.00	0.20	0.80	
295017AK1.02 1							
48	5	0	0	0	5	0	
	1.00	0.00	0.00	0.00	1.00	0.00	
295018AK2.02 7							
49	5	0	5	0	0	0	
	1.00	0.00	1.00	0.00	0.00	0.00	
295019AK2.11 8							
50	5	0	1	1	0	3	
	0.60	0.00	0.20	0.20	0.00	0.60	
295021AK2.07 1							
51	5	0	5	0	0	0	
	1.00	0.00	1.00	0.00	0.00	0.00	
295022AK2.07 1							
52	5	0	5	0	0	0	
	1.00	0.00	1.00	0.00	0.00	0.00	
295023AK2.01 10							
53	5	0	0	5	0	0	
	1.00	0.00	0.00	1.00	0.00	0.00	
295024EK1.01 11							
54	5	0	0	0	0	5	
	1.00	0.00	0.00	0.00	0.00	1.00	

Overall		Omits A (True) B (False)		C	D
Item	Admins				
p					
295025EK1.03 12					
55	5	0	4	0	1
	0.80	0.00	0.80	0.00	0.20
					0.00
295026EK2.03 15					
56	5	0	0	0	0
	1.00	0.00	0.00	0.00	0.00
					5
					1.00
295026G2.4.23 13					
57	5	0	0	0	5
	1.00	0.00	0.00	0.00	1.00
					0.00
295028EK2.01 15					
58	5	0	0	0	5
	1.00	0.00	0.00	0.00	1.00
					0.00
295030EK1.01 16					
59	5	0	0	2	3
	0.60	0.00	0.00	0.40	0.60
					0.00
295031G2.4.45 17					
60	5	0	0	1	0
	0.80	0.00	0.00	0.20	0.00
					0.80
295037EA1.07 19					
61	5	0	0	1	0
	0.80	0.00	0.00	0.20	0.00
					0.80
295038EK1.03 19					
62	5	0	1	4	0
	0.80	0.00	0.20	0.80	0.00
					0.00
300000K4.02 1					
63	5	0	0	1	0
	0.80	0.00	0.00	0.20	0.00
					0.80
400000K3.01 1					
64	5	0	0	0	0
	1.00	0.00	0.00	0.00	0.00
					5
					1.00
600000AK2.01 20					
65	5	0	1	0	0
	0.80	0.00	0.20	0.00	0.00
					0.80

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
	P					
G2.1.2 1						
66	5	0	0	1	2	2
	0.40	0.00	0.00	0.20	<b>0.40</b>	0.40
G2.1.25 1						
67	5	0	0	5	0	0
	1.00	0.00	0.00	<b>1.00</b>	0.00	0.00
G2.2.11 1						
68	5	0	0	4	1	0
	0.80	0.00	0.00	<b>0.80</b>	0.20	0.00
G2.2.27 1						
69	5	0	0	1	4	0
	0.80	0.00	0.00	0.20	<b>0.80</b>	0.00
G2.2.4 1						
70	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	<b>1.00</b>	0.00
G2.3.10 1						
71	5	0	5	0	0	0
	1.00	0.00	<b>1.00</b>	0.00	0.00	0.00
G2.3.2 1						
72	5	0	1	0	4	0
	0.80	0.00	0.20	0.00	<b>0.80</b>	0.00
G2.4.29 1						
73	5	0	0	2	1	2
	0.40	0.00	0.00	<b>0.40</b>	0.20	0.40
G2.4.45 1						
74	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	<b>1.00</b>
G2.4.7 1						
75	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	<b>1.00</b>	0.00
201003A2.05 1						
76	5	0	5	0	0	0
	1.00	0.00	<b>1.00</b>	0.00	0.00	0.00

Overall		Omits	A (True)	B (False)	C	D
Item	Admins					
p						
204000G2.1.2 1						
77	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00
211000G2.1.14 2						
78	5	0	4	0	0	1
	0.80	0.00	0.80	0.00	0.00	0.20
212000A2.20 1						
79	5	0	5	0	0	0
	1.00	0.00	1.00	0.00	0.00	0.00
215004A2.02 3						
80	5	0	3	0	2	0
	0.60	0.00	0.60	0.00	0.40	0.00
245000A2.07 1						
81	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
262001A2.08 3						
82	5	0	0	1	0	4
	0.80	0.00	0.00	0.20	0.00	0.80
295003AA2.04 1						
83	5	0	2	0	1	2
	0.40	0.00	0.40	0.00	0.20	0.40
295004AA2.02 1						
84	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
295014G2.4.31 1						
85	5	0	0	0	4	1
	0.20	0.00	0.00	0.00	0.80	0.20
295020AA2.04 1						
86	5	0	0	3	1	1
	0.60	0.00	0.00	0.60	0.20	0.20
295025EA2.06 1						
87	5	0	0	0	0	5
	1.00	0.00	0.00	0.00	0.00	1.00

Overall		Omits A (True) B (False)		C	D	
Item	Admins					
P						
295026G2.1.28 1						
88	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
295028EA2.06 1						
89	5	0	0	0	1	4
	0.80	0.00	0.00	0.00	0.20	0.80
295033G2.4.50 1						
90	5	0	0	4	0	1
	0.80	0.00	0.00	0.80	0.00	0.20
295038G2.2.22 1						
91	5	0	0	2	0	3
	0.40	0.00	0.00	0.40	0.00	0.60
400000A2.03 1						
92	5	0	1	4	0	0
	0.80	0.00	0.20	0.80	0.00	0.00
600000G2.4.29 1						
93	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00
G2.1.14 1						
94	5	0	4	0	0	1
	0.80	0.00	0.80	0.00	0.00	0.20
G2.1.7 1						
95	5	0	4	1	0	0
	0.80	0.00	0.80	0.20	0.00	0.00
G2.2.19 1						
96	5	0	0	0	3	2
	0.40	0.00	0.00	0.00	0.60	0.40
G2.2.34 2						
97	5	0	0	0	5	0
	1.00	0.00	0.00	0.00	1.00	0.00
G2.3.9 1						
98	5	0	0	5	0	0
	1.00	0.00	0.00	1.00	0.00	0.00

	Overall	Omits	A (True)	B (False)	C	D
Item	Admins					
	P					
G2.4.11 1						
99	5	0	4	0	1	0
	0.80	0.00	0.80	0.00	0.20	0.00
G2.4.26 1						
100	5	0	1	4	0	0
	0.80	0.00	0.20	0.80	0.00	0.00



**U.S. Nuclear Regulatory Commission****Site-Specific RO Written Examination****Applicant Information**

Name:

Date:

Facility/Unit:

Region: I ☐ II ☐ III ☐ IV ☐Reactor Type: W ☐ CE ☐ BW ☐ GE ☐

Start Time:

Finish Time:

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

**Applicant Certification**

All work done on this examination is my own. I have neither given nor received aid.

\_\_\_\_\_  
Applicant's Signature**Results**

Examination Value \_\_\_\_\_ Points

Applicant's Score \_\_\_\_\_ Points

Applicant's Grade \_\_\_\_\_ Percent

1. **Unit 1** is at 85% power with the Control Rod Weekly Exercise, 34SV-C11-003-1, in progress.

When the operator selects and withdraws control rod 26-35 one notch, Rod Block Monitor (RBM) "A" immediately reaches 120%.

Which ONE of the following describes how the reactor manual control system will respond?

- A. The rod settle function will NOT occur.  
Only the **RBM UPSCALE OR INOPERATIVE** annunciator will alarm.  
NO other annunciators will be received.
- B. The rod settle function will NOT occur.  
**RBM UPSCALE OR INOPERATIVE** annunciator will alarm.  
**ROD OUT BLOCK** annunciator will alarm.
- C. The rod settle function will occur.  
Only **RBM UPSCALE OR INOPERATIVE** annunciator will alarm.  
NO other annunciators will be received.
- D✓ The rod settle function will occur.  
**RBM UPSCALE OR INOPERATIVE** annunciator will alarm.  
**ROD OUT BLOCK** annunciator will alarm.

2. **Unit 1** is operating with both recirc pumps speed at 80% and the operator is raising power using the Master Recirc Flow Control in Manual. During this evolution, a speed mismatch develops such that the "1A" recirc pump speed demand is 88% with actual pump speed at 80%.

Which ONE of the following predicts how the "1A" recirc pump speed control system will respond?

The scoop tube \_\_\_\_\_ lock and the PF lamp on the M/A station \_\_\_\_\_ be flashing.

- A✓ will / will
- B. will / will NOT
- C. will NOT / will
- D. will NOT / will NOT

3. **Unit 1** is operating at 100% power with the recirc system operating as follows:

1B31-R620, Master Recirc Flow Control: MANUAL  
1B31-R621A, Pump A Speed Control: MANUAL  
1B31-R621B, Pump B Speed Control: MANUAL

The following alarms are received:

**FLUID DRIVE A SCOOP TUBE LOCK (602-126-1)**  
**SPEED CONTROL A SIGNAL FAILURE (602-132-1)**

**NO** other alarms are present on any Control Room Panels.

Which ONE of the following conditions caused this condition?

- A. The master recirc controller's output signal failed low.
- B✓ The individual recirc controller's output signal failed low.
- C. Loss of Instrument Bus "A" (1R25-S064).
- D. Loss of power to the scoop tube positioner.

4. A leak in the drywell has occurred on **Unit 1** and the following conditions currently exist:

- ♦ Reactor level +20"
- ♦ Reactor pressure is 750 psig
- ♦ Drywell pressure 2 psig
- ♦ 1R24-S018A is de-energized

Which ONE of the following describes how the LPCI system will respond if reactor pressure subsequently lowers to 160 psig?

- A. LPCI Loop A and B will both inject.
- B. LPCI Loop A will be dead-headed.  
LPCI Loop B will inject.
- C✓ LPCI Loop A will NOT inject but will be running on minimum flow.  
LPCI Loop B will inject.
- D. Neither LPCI Loop will inject.

5. The following conditions exist on **Unit 2**:

- ♦ Reactor pressure 100 psig
- ♦ MSIVs closed
- ♦ "B" Loop RHR in shutdown cooling with a cooldown in progress
- ♦ "A" Loop RHR in standby lineup

Which ONE of the following describes how the plant will be affected if an RPS MG set trip occurs? (assume no operator action)

Reactor pressure will \_\_\_\_ ; a mode change \_\_\_\_ occur.

- A. lower; will
- B. lower; will NOT
- C. rise; will
- D✓ rise; will NOT

6. **Unit 2** HPCI auto-initiated and injected following the loss of both Reactor Feedwater Pumps and then subsequently tripped on RPV high water level. The following conditions currently exist:

- ♦ RPV water level is +20 inches and slowly lowering
- ♦ Drywell pressure is 1.5 psig and slowly rising

Given these current plant conditions, which ONE of the following choices will complete the following statement to describe the HPCI logic?

"If the operator depresses the ...

- A✓ HI REACTOR WATER LEVEL TRIP RESET pushbutton, then HPCI will re-start and inject after 2E41-F006, HPCI Injection Valve, re-opens.
- B. HI REACTOR WATER LEVEL TRIP RESET pushbutton, HPCI will NOT re-start.
- C. INITIATION SIGNAL RESET pushbutton, HPCI will re-start but NOT inject.
- D. INITIATION SIGNAL RESET pushbutton, then HPCI will re-start and inject after 2E41-F006, HPCI Injection Valve, re-opens.

7. Which ONE of the following describes the **Unit 1** HPCI mechanical overspeed trip?

- A. ✓ The stop valve begins closing, turbine speed lowers and then the stop valve re-opens when turbine speed is below the reset speed value. The F006 injection valve will remain open.
- B. The stop valve fully closes and remains closed until the ball and tappet is locally reset. The F006 injection valve will remain open.
- C. The F006 injection valve will fully close and remain closed until the ball and tappet is locally reset. When the F006 injection valve closes, the stop valve fully closes.
- D. The control valve begins closing, turbine speed lowers and then the control valve re-opens when turbine speed is below the reset speed value. The F006 injection will remain open.

8. **Unit 1** is operating at 100% power. At the completion of the 34SV-E21-002-1, Core Spray Valve Operability Surveillance, while performing the Standby Lineup attachment of 34SO-E21-001-1, Core Spray System, the Independent Verifier observes the following control board indications :

- ♦ 1E21-F001B, torus suction valve.....OPEN
- ♦ 1E21-F019B, torus suction valve.....OPEN
- ♦ 1E21-F004B, outboard discharge valve..... CLOSED
- ♦ 1E21-F005B, inboard discharge valve..... OPEN
- ♦ 1E21-F031B, min flow valve.....CLOSED

Which ONE of the following describes how the above lineup compares to the required standby lineup and also describes the valve logic?

A. The lineup is correct.

If the min flow valve is opened, it will auto-close.

B✓ The min flow valve position AND both discharge valves' position are incorrect.

The discharge valves can be realigned by first closing the F005B and then opening the F004B.

C. The min flow valve position is incorrect; however, both discharge valves' position are correct.

If the min flow valve is opened, it will stay open.

D. Both discharge valves' position are incorrect; however, the min flow valve position is correct.

The discharge valves can be realigned by first closing the F005B and then opening the F004B.

9. Due to an electrical transient on **Unit 2**, 600 V bus 2C is lost. Which ONE of the following describes how this power failure affects the SBLC system?

- A✓ Both amber squib valve indications will be OFF on the 2H11-P603 panel.  
ONLY the 'B' squib valve will fire, if the SBLC switch is placed in the 'Start Sys B' position.
- B. Both amber squib valve indications will be OFF on the 2H11-P603 panel.  
Both squib valves will fire if the SBLC switch is placed in either the 'Start Sys A' OR 'Start Sys B' position.
- C. Both amber squib valve indications will be ON on the 2H11-P603 panel.  
ONLY the 'B' squib valve will fire, if the SBLC switch is placed in the 'Start Sys B' position.
- D. Both amber squib valve indications will be ON on the 2H11-P603 panel.  
Both squib valves will fire if the SBLC switch is placed in either the 'Start Sys A' OR 'Start Sys B' position.

10. On **Unit 2**, Which ONE of the following is a normal operating status light lineup, i.e., NO ALARM CONDITIONS, for Analog Transmitter Trip System (ATTS) Panel 2H11-P925?

<u>TRIP STATUS/MTU</u>	<u>STATUS/MTU</u>	<u>GROSS FAIL/MTU</u>	<u>POWER ON/P925</u>
A. ON/GREEN	ON/GREEN	ON/GREEN	ON/GREEN
B✓ OUT	ON/GREEN	OUT	ON/CLEAR
C. ON/AMBER	OUT	ON/GREEN	ON/RED
D. OUT	ON/RED	OUT	ON/GREEN

11. Refueling is in progress.

Which ONE of the following describes the reactor protection system (RPS) manual scram logic, with the shorting links removed?

A✓ On Unit 1, the manual scram pushbutton will NOT de-energize an automatic scram channel.

When SRM "A" reaches  $3 \times 10^5$  cps, a reactor scram will occur.

B. On Unit 1, a manual scram pushbutton will de-energize an automatic scram channel.

When SRM "A" reaches  $7 \times 10^4$  cps, a reactor scram will occur.

C. On Unit 2, the manual scram pushbutton will NOT de-energize an automatic scram channel.

When SRM "A" reaches  $3 \times 10^5$  cps, a reactor scram will occur.

D. On Unit 2, the manual scram pushbutton will de-energize an automatic scram channel.

When SRM "A" reaches  $7 \times 10^4$  cps, a reactor scram will occur.



12. A **Unit 2** startup is in progress. The plant operator inadvertently downranges IRM "G" from range 4 to range 3 and the following annunciators are received:

- ◆ **IRM BUS A UPSCALE TRIP OR INOP** (603-203-1S)
- ◆ **REACTOR NEUTRON MONITORING SYS TRIP** (603-109-1)
- ◆ **REACTOR AUTO SCRAM SYSTEM A TRIP** (603-117-1)
- ◆ **IRM UPSCALE** (603-221-1)
- ◆ **ROD OUT BLOCK** (603-238-1)

The operator quickly realizes his mistake and ranges IRM "G" to range 5 where it indicates ~ 7 on the 0 - 40 Scale. No further actions have yet been taken.

At this point, which ONE of the following describes the upscale (amber) and upscale trip (red) lamp indications on the P603 panel apron section and on the IRM drawer on panel P606?

- A✓ The amber and red lamps on the P603 panel apron section are OFF.  
The amber and red lamps on the IRM drawer at panel P606 are still ON.  
ONLY the reset switch on the IRM drawer is required to clear the lamps.
- B. The amber and red lamps on the P603 panel apron section are still ON.  
The amber and red lamps on the IRM drawer at panel P606 are still ON.  
ONLY the 1/2 scram reset is required to clear the lamps at P603.  
ONLY the reset switch on the IRM drawer is required to clear the lamps at P606.
- C. ONLY the amber lamp on the P603 panel apron section is still ON. (red is OFF)  
ONLY the amber lamp at the IRM drawer P606 panel is still ON. (red is OFF)  
ONLY the reset switch on the IRM drawer can be used to clear the P603 & P606 amber lamps.
- D. The amber and red lamps on the P603 panel apron section are both OFF.  
ONLY the amber lamp at the IRM drawer P606 panel is ON. (red light is OFF)  
ONLY the reset switch on the IRM drawer can be used to clear the P606 amber lamps.

13. A **Unit 2** startup is in progress with the following conditions:

- ♦ Reactor power ~ 1%
- ♦ IRMs on range 5 and 6
- ♦ All SRM detectors are 90% withdrawn
- ♦ None of the SRM detectors are currently being moved

Which ONE of the following is correct for the SRM detector and period indication?

- A. Retract permit light is extinguished.  
Changes in the SRM period indication reflects core neutron flux changes.
- B. Retract permit light is extinguished.  
Changes in the SRM period indication do NOT reflect core neutron flux changes.
- C. Retract permit light is illuminated.  
Changes in the SRM period indication do NOT reflect core neutron flux changes.
- D✓ Retract permit light is illuminated.  
Changes in the SRM period indication reflects core neutron flux changes.

14. **Unit 2** is operating at 100% power with no rods selected and the following alarm is received:

**LPRM UPSCALE (603-237)**

The operator confirms at panel 2H11-P603 that one LPRM is upscale as shown on the LPRM BARGRAPHS function.

Which ONE of the following describes how this will affect the core thermal limit calculations and the requirements for APRM operability?

- A✓ MFLPD and MAPRAT values will rise.  
APRM operability requires a minimum of 3 LPRMs per level.
- B. MFLPD and MAPRAT values will rise.  
APRM operability requires a minimum of 2 LPRMs per level.
- C. MFLPD and MAPRAT values will lower.  
APRM operability requires a minimum of 3 LPRMs per level.
- D. MFLPD and MAPRAT values will lower.  
APRM operability requires a minimum of 2 LPRMs per level.

15. **Unit 2** experienced a dual feed pump trip from 100% power.

- ♦ HPCI is inoperable.
- ♦ RCIC and CRD are in operation.
- ♦ Reactor water level is at -38 inches and is slowly decreasing.

RCIC is operating in automatic with the following control board indications:

- ♦ E51-R604 Pump Suction Press      10 psig
- ♦ E51-R601 Pump Discharge Press    225 psig
- ♦ E51-R602 Turb Inlet Press          910 psig
- ♦ E51-R603 Turb Exh Press            10 psig
- ♦ E51-R610 Turb Speed                1900 rpm
- ♦ E51-R612 Turbine Controller flow   400 gpm

Given these plant conditions, which ONE of the following is required for RCIC, including the reason?

- A. Continue to run RCIC.  
Raise turbine speed > 2000 rpm by lowering the flow controller automatic setpoint to prevent exhaust check valve damage.
- B. Continue to run RCIC.  
Raise turbine speed > 2000 rpm by placing the flow controller in MANUAL and then lowering flow using the slider bar to prevent exhaust check valve damage.
- C. IMMEDIATELY secure RCIC.  
The low suction pressure trip failed.
- D✓ IMMEDIATELY secure RCIC.  
RCIC is not injecting into the Rx vessel.

16. **Unit 2** was operating at 100% power with the 2B Core Spray pump out of service (inop).

A loss of offsite power occurred on Unit 2 and the following plant conditions currently exist at time **t = 0**:

- ♦ 4KV Emergency buses 2E and 2F are de-energized
- ♦ Drywell pressure is 1.5 psig and slowly decreasing
- ♦ Reactor water level is -120 inches and steady with RCIC.

Which ONE of the following describes how the automatic depressurization system (ADS) will be affected by these plant conditions?

- A✓ ADS will initiate after ~ 12.7 minutes have elapsed.
- B. ADS will initiate as soon as ~ 1.7 minutes have elapsed.
- C. ADS will NOT initiate because no RHR pumps are running.
- D. ADS will NOT initiate because no Core Spray pumps are running.

17. An ATWS has occurred on **Unit 2**, with the following conditions:

- ♦ APRM power ~ 4%
- ♦ MSIVs are open with EHC controlling pressure at 840 psig
- ♦ No SRVs are open
- ♦ Drywell pressure is 1 psig and steady
- ♦ RPV level is being controlled -65" to -75" in accordance with CP-3
- ♦ SBLC injection is in progress
- ♦ Both loops of RHR are placed in torus cooling using the placard at 2H11-P601
- ♦ RHR containment spray valve control and 2/3 core height override switches have not been used and are in their normal line-up position.

While the rods are being inserted, a group 1 isolation occurs. The SRO orders that RPV level be lowered to -130".

Which ONE of the following predicts how the 2E11-F028 (torus spray or test) and 2E11-F024 (torus cooling) valves will respond when RPV level reaches -130", including required actions (if any)?

A✓ Both valves auto-closed.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F028 valve will automatically re-open.  
(2E11-F028 switch not required to be re-opened and 2/3 core height switch not required)

B. Both valves auto-closed.

BOTH the containment spray valve control override switch and the 2/3 core height switch are required to re-open both valves. The sequence of these two switches does not matter, i.e., either switch may be positioned first in order for both valves to be re-opened.

C. The 2E11-F028 valve auto-closed. The 2E11-F024 valve remained open.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F028 valve will automatically re-open.  
(2E11-F028 switch not required to be re-opened and 2/3 core height switch not required)

D. The E11-F028 valve remained open. The 2E11-F024 valve auto-closed.

If ONLY the containment spray valve control override switch is placed in the MANUAL position, THEN the 2E11-F024 valve will automatically re-open.  
(2E11-F024 switch not required to be re-opened and 2/3 core height switch not required)

18. **Unit 2** is at 20% power and the turbine generator has just been synchronized to the grid. Main condenser vacuum decreases to -5 inches Hg.

Which ONE of the following predicts the status of the main steam line isolation valves and identifies the procedure for depressurizing the reactor to cold shutdown?

- A. MSIVs are still open  
31EO-EOP-107-2, Alternate RPV Pressure Control
- B. MSIVs are still open  
34GO-OPS-013-2, Normal Plant Shutdown
- C. MSIVs are closed  
31EO-EOP-107-2, Alternate RPV Pressure Control
- D✓ MSIVs are closed  
34GO-OPS-013-2, Normal Plant Shutdown

19. **Unit 1** is in Mode 4 with the following conditions:

- ♦ "1B" RHR pump is in shutdown cooling
- ♦ CRD flow is ~ 60 gpm
- ♦ RWCU reject flow is ~ 60 gpm
- ♦ RPV level is +36 "

Which ONE of the following identifies how a trip of the "1B" RPS MG set will affect reactor water level and the primary containment isolation system logic? (assume no operator action)

- A. Level will remain the same.  
Inboard Shutdown Cooling Suction (E11-F009) and LPCI Inboard Injection Valve (E11-F015B) will BOTH auto-close.
- B. Level will steadily rise.  
ONLY the Inboard Shutdown Cooling Suction (E11-F009) valve will close.  
The LPCI Inboard Injection Valve (E11-F015B) will remain open.
- C✓ Level will steadily rise.  
Outboard Shutdown Cooling Suction (E11-F008) and LPCI Inboard Injection Valve (E11-F015B) will BOTH auto-close.
- D. Level will remain the same.  
ONLY the Outboard Shutdown Cooling Suction (E11-F008) valve will close.  
The LPCI Inboard Injection Valve (E11-F015B) will remain open.

20. Both Units are operating at 100% power with RHR in standby.

Which ONE of the following describes how the RHR piping water level is maintained and/or monitored and describes the normal status of the containment spray piping?

- A. If the water level in the spray line piping upstream of the containment spray outboard valve (2E11-F016A) drops, then an annunciator will alarm in the control room.

The section of piping between the 2E11-F016A and the containment spray inboard valve (2E11-F021A), is maintained full of water by the keepfill system.

- B✓ If the water level in the spray line piping upstream of 2E11-F016A drops, then an annunciator will alarm in the control room.

The section of piping between the 2E11-F016A and 2E11-F021A is **NOT** maintained full of water by the keepfill system.

- C. The **Unit 2** keepfill jockey pumps do **NOT** have any auto-start feature.

The section of piping between the 2E11-F016A and 2E11-F021A is **NOT** maintained full of water by the keepfill system.

- D. The **Unit 1** keepfill jockey pumps do **NOT** have any auto-start feature.

The section of piping between the 1E11-F016A and 1E11-F021A is maintained full of water by the keepfill system.

21. **Unit 1** is operating at 100% power with the following conditions:

- ♦ "1A" FPC Heat Exchanger in service
- ♦ "1A" FPC Filter Demin in service

The operator then receives the following alarm:

**1A FUEL POOL PUMP DISCH PRESS HIGH (654-005)**

Local observation indicates that the "1A" Fuel pool cooling pump is in service and its actual discharge pressure is 145 psig.

Which ONE of the following describes the fuel pool cooling pump discharge pressure logic and also identifies the required operator actions in accordance with this annunciator procedure?

- A. The pump should have already automatically tripped.  
Trip the pump and place RHR in fuel pool cooling assist mode.
- B✓ The pump should have already automatically tripped.  
Trip the pump and place "1B" FPC pump and demin in service.
- C. The pump discharge pressure is still below the automatic trip setpoint.  
Remove the "1A" demin from service.
- D. The pump discharge pressure is still below the automatic trip setpoint.  
Throttle open the 1G41-F010A, Filter Demin Bypass Valve.



22. While performing the 31EO-EOP-010-2, RPV Control (Non-ATWS) the following step is encountered:

<u>IF</u> ANY SRV is cycling on its relief setpoint
-----
<u>THEN</u> manually open SRVs
<u>UNTIL</u>
reactor pressure is below 960 psig
use sequence listed in Table 1

Which ONE of the following interprets the phrase "cycling on its relief setpoint" and is one of the bases for this EOP step?

- A✓ "Cycling" means repetitive SRV actuations on the electrical overpressure setpoint.

The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.

- B. "Cycling" means repetitive SRV actuations on the electrical overpressure setpoint.

Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.

- C. "Cycling" means repetitive SRV actuations due to Low Low Set.

The Table 1 opening sequence is required to evenly distribute cycles on the SRVs and to prevent localized heating in the torus.

- D. "Cycling" means repetitive SRV actuations due to Low Low Set.

Pressure is stabilized at a value below the high RPV pressure scram setpoint to permit the scram logic to be reset.

23. **Unit 2** turbine generator is operating at 85% when the "D" moisture separator hotwell drain tank becomes full of water. The "D" MSR's downcomer is full to the bottom of the moisture separator shell.

Which ONE of the following predicts the effect of this condition on the reactor feedpumps steam inlet control valves?

- A✓ The HP control valve travels from full closed to open.
- B. The LP control valve travels from full closed to open.
- C. The HP control valve closes.
- D. The LP control valve closes.

24. **Unit 2** is operating at 100% power with all systems normally aligned. The RCIC Pump Operability, 34SV-E51-002-2, is being performed. The operator placed the TEST switch to the START position to commence the RCIC surveillance test and now RCIC is running with the flow controller in AUTOMATIC and its flowpath aligned to the CST.

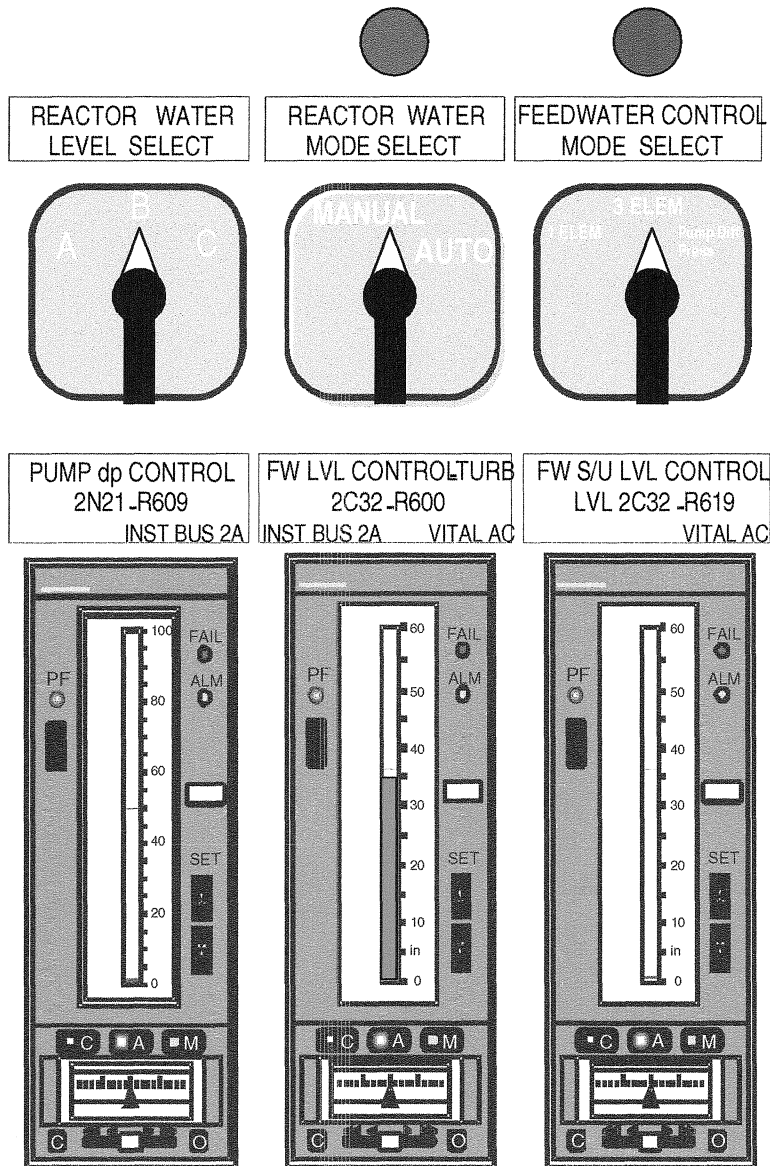
While RCIC is running, both reactor feed pumps trip and RPV level drops to -45 inches.

Assuming no operator actions, which ONE of the following predicts the plant response?

- A. Both of the FW Line Flow indicators 2C32-R604A/B at panel 2H11-P603 will be indicating injection flow; however, the amounts will be different. RCIC and HPCI will both be injecting.
- B. The "A" FW Line Flow indicator 2C32-R604A at panel 2H11-P603 will be indicating HPCI injection flow. RCIC does NOT inject.
- C✓ Both of the FW Line Flow indicators 2C32-R604A/B at panel 2H11-P603 will be indicating zero injection flow. RCIC and HPCI will both be injecting.
- D. The "B" FW Line Flow indicator 2C32-R604B at panel 2H11-P603 will be indicating HPCI injection flow. RCIC does NOT inject.

25. The **Unit 2** Feedwater Level Control System is aligned as follows:

(Note: The lights above each SELECT Switch is extinguished.)



Given this switch alignment, which ONE of the following choices identifies the primary input level signal and how reactor water level will be affected if the manual output lever on the bottom of the Reactor Feedpump Turbine Master Controller (2C32-R600) is held in the "O" (open) position?

(NOTE: The Green "A" light on each controller is illuminated.)

25. A. C32-K648, median level signal processor.  
Level will rise.
- B✓ Directly from the C32-N004B level transmitter signal.  
Level will remain the same.
- C. C32-K648, median level signal processor.  
Level will remain the same.
- D. Directly from the C32-N004B level transmitter signal.  
Level will rise.

26. **Unit 2** is operating at 70% power with the following feedwater control alignment:

- ♦ Reactor water level select switch: "B"
- ♦ Reactor water mode select switch: AUTO
- ♦ Feedwater control mode select switch: 3 element
- ♦ FW level control turb 2C32-R600: AUTO

Given this alignment, which ONE of the following describes how a loss of instrument air to the condensate and feedwater system will affect the reactor water level control system? (assume that a reactor scram does not occur and is not required.)

- A✓ REACTOR LEVEL CONTROL VALVE LOCKED will alarm  
Reactor Feedwater Pumps 2A and 2B speed will increase due to system minimum flow valves failing open.
- B. REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm  
Reactor Feedwater Pumps 2A and 2B speed will remain the same with no minimum flow valve protection.
- C. REACTOR LEVEL CONTROL VALVE LOCKED will alarm  
Reactor Feedwater Pumps 2A and 2B speed will remain the same with no minimum flow valve protection.
- D. REACTOR LEVEL CONTROL VALVE LOCKED will NOT alarm.  
Reactor Feedwater Pumps 2A and 2B speed will increase due to system minimum flow valves failing open.

27. **Unit 2** is starting up with Primary Containment Inerting in progress per 34SO-T48-002-2, Containment Atmospheric Control and Dilution Systems.

Which ONE of the following describes the SBGT lineup and also identifies when inerting should be stopped in accordance with this procedure?

- A. SBGT is running with a suction ONLY from the Drywell.

Inerting should be stopped when Oxygen levels decrease to a minimum of 3.5%.

- B. SBGT is running with a suction ONLY from the Torus.

Inerting should be stopped when Oxygen levels decrease to a minimum of 5%.

- C✓ SBGT is running with a suction from the Drywell AND either the Refuel Floor OR Reactor Building.

Inerting should be stopped when Oxygen levels decrease to a minimum of 3.5%.

- D. SBGT is running with a suction from the Torus AND either the Refuel Floor OR Reactor Building.

Inerting should be stopped when Oxygen levels decrease to a minimum of 5%.

28. Both units were operating at 100% power with all systems normally aligned when a tornado damages the switchyard and ALL offsite power is lost to both units.

Neither unit currently has a LOCA signal present.

Which ONE of the following describes how the AC electrical distribution will be affected and identifies an appropriate procedure(s) to implement in conjunction with the EOPs?

- A✓ Busses 2E and 2G will be energized

Bus 2F will be DE-ENERGIZED

Enter 34AB-R22-002-1/2, Loss of 4160V Emergency Bus on both units

- B. Busses 1E and 1G will be energized

Bus 1F will be DE-ENERGIZED

Enter 34AB-R22-002-1, Loss of 4160V Emergency Bus ONLY on Unit 1

- C. Busses 2E, 2F, and 2G will all be energized

Enter 34AB-R22-004-1/2, Loss of 4160V Bus A, B, C, or D on both units

- D. Busses 1E, 1F, and 1G will all be energized

Enter 34AB-R22-004-2, Loss of 4160V Bus A, B, C, or D ONLY on Unit 2

29. **Unit 2** is operating at 100% power when a loss of Vital AC 2R25-S063 occurs.

Which ONE of the following describes how this power loss affects the Main Turbine?

- A✓ The turbine will NOT trip. All the Mark VI human machine interface (HMI) screens in the control room will lose power.
- B. The turbine WILL trip because two EHC processors in the packaged electrical & electronic control compartment (PEECC) and two pressure transmitters will lose power.
- C. The turbine WILL trip because the power to the turbine trip relays will be lost.
- D. The turbine will NOT trip. The main turbine thrust bearing wear detector and vibration detection will be lost.

30. After a system outage, tagout removal on the Unit 1 HPCI system is being performed to restore HPCI with the plant operating at 100% power.

The breaker for the Lube Oil Cooling Wtr Valve 1E41-F059 must be manipulated to the closed position during the performance of the tagout removal.

Which ONE of the following describes the required verification activities, if any, which must be completed before the system can be considered operable in accordance with NMP-OS-002, Verification Policy?

- A. No verification by a second person is required.
- B. Only a peer check is required and no documentation of this peer check is required.
- C. Only concurrent verification is required and this must be documented.
- D✓ Only Independent verification is required and this must be documented.

31. A loss of offsite power occurred on **Unit 2**. The following conditions currently exist:

- ♦ Diesel Generator 2A is loaded to 300 Kw
- ♦ Offsite power has been re-established via SAT 2C
- ♦ The control room operator is in the process of transferring power from the diesel to the alternate power supply

Which ONE of the following identifies the syncroscope direction and switch position required to parallel and realign bus 2E to its alternate power supply?

A. Clockwise

Diesel generator test switch is required to be placed in the TEST position.

B. Clockwise

Diesel generator 2A test SAT 2C out of service interlock switch is required to be placed in the TEST position.

C✓ Counter-clockwise

Diesel generator test switch is required to be placed in the TEST position.

D. Counter-clockwise

Diesel generator 2A test SAT 2C out of service interlock switch is required to be placed in the TEST position.

32. A leak in the drywell has occurred on **Unit 2** and the following conditions currently exist:

- ♦ Reactor pressure 650 psig and slowly lowering
- ♦ Reactor level -45" and rising
- ♦ Drywell pressure is 1.9 psig and steady
- ♦ Diesel 1B is unavailable

Which ONE of the following is the current status of the 2C RHR Pump and also predicts how this pump will be affected if a loss of offsite power subsequently occurs on **Unit 2**?

Before the LOSP, RHR Pump 2C \_\_\_\_\_ running.  
After the LOSP, RHR Pump 2C \_\_\_\_\_.

- A. is / will trip and re-start 22 seconds after the loss of offsite power.
- B. is NOT / will NOT be running after the loss of offsite power.
- C. is NOT / will auto-start 12 seconds after the loss of offsite power.
- D✓ is / will NOT be running after the loss of offsite power.

33. **Unit 1** is operating at 100% power. Which ONE of the following identifies the normal temperature of the in-service offgas catalytic recombiner, including the operational implication of catalytic recombination in the offgas system?

- A. Normally ~ 800 degrees  
Recombiner temperature is NOT dependent on the reactor power level.
- B✓ Normally ~ 800 degrees  
Recombiner temperature is dependent on the reactor power level.
- C. Normally ~ 300 degrees  
Recombiner temperature is dependent on the reactor power level.
- D. Normally ~ 300 degrees  
Recombiner temperature is NOT dependent on the reactor power level.



34. Core alterations are in progress on **Unit 2**.

A fuel bundle is being moved from the spent fuel pool to the vessel core through the transfer canal.

The following control room annunciator is received:

**REFUELING FLOOR AREA RADIATION HIGH (601-312-2)**

The operator subsequently observes the following at the panel 2D21-P600:

	<u>RED LIGHT</u>	<u>READING</u>
♦ Reactor head laydown area (2D21-K601A)	ON	25mR/hr
♦ Dryer separator pool (2D21-K601E)	OFF	40 mR/hr
♦ Spent fuel pool & new storage (2D21-K601M)	OFF	10 mR/hr
♦ Reactor vessel refueling floor (2D21-K611K)	OFF	10mR/hr
♦ Reactor vessel refueling floor (2D21-K611L)	OFF	10mR/hr

Given these conditions, which ONE of the following describes the Main Control Room Environmental Control (MCREC) System response and required actions in accordance with 34FH-OPS-001-0, Fuel Movement Operation?

- A. MCREC remains running in its normal mode  
The bundle is required to be lowered into either the reactor vessel OR the fuel pool until an investigation is completed.
- B✓ MCREC shifts to the pressurization mode  
The bundle is required to be lowered into either the reactor vessel OR the fuel pool until an investigation is completed.
- C. MCREC remains running in its normal mode  
The bundle is required to be lowered back into the fuel pool ONLY, until an investigation is completed.
- D. MCREC shifts to the pressurization mode  
The bundle is required to be lowered back into the fuel pool ONLY, until an investigation is completed.

35. While transferring RWCU spent resin, the **Unit 2** reactor building ventilation activity level rises such that the 2D11-K609 A thru D (Reactor Bldg Potential Contaminated Area Ventilation Exhaust Rad Monitor) read 25-30 mR/hr.

Which ONE of the following identifies the current status of Unit 1 and 2 Standby Gas Treatment Fans?

UNIT ONE		UNIT TWO	
<b>SBGT Fans</b>	<b>Suction Aligned to</b>	<b>SBGT Fans</b>	<b>Suction Aligned to</b>
A. Both OFF	isolated	Both ON	Refuel & Rx Bldg
B. Both ON	Rx Bldg only	Both ON	Rx Bldg only
C. 1 ON 1 OFF	Rx Bldg only	1 ON 1 OFF	Rx Bldg only
D✓ Both ON	Refuel & Rx Bldg	Both ON	Refuel & Rx Bldg

36. A fuel failure event has occurred on **Unit 1**. The Group 1 isolation logic received an auto-closure signal on low water level; however, F022A and F028A ("A" inboard & outboard) MSIVs failed to close automatically and cannot be manually closed. Additionally, a break exists on "A" main steam line (downstream of the MSIVs) and radioactive steam is leaking into the Turbine Building.

Assuming that the HVAC systems responded as expected, which ONE of the following describes the offsite release that is occurring due to this steam leak into the Turbine Building?

- A✓ Ground level release and is NOT being filtered by the Standby Gas Treatment System
- B. Elevated release and is NOT being filtered by the Standby Gas Treatment System
- C. Ground level release and is being filtered by the Standby Gas Treatment System
- D. Elevated release and is being filtered by the Standby Gas Treatment System

37. A **Unit 2** startup is in progress in accordance with 34GO-OPS-001-2, Plant Startup.

The following sequence of events occur:

- ♦ Both Recirc Pump speeds were raised from minimum speed to 30%
- ♦ After the recirc pump speeds were raised, the 2A Recirc MG set tripped.

Five minutes after the MG set trip, the following control panel indications exist:

- ♦ Annunciator **"RECIRC LOOP A OUT OF SERVICE"** (602-127) in alarm
- ♦ Core Flow Recorder 2B21-R613 7.2 Mlb/hr
- ♦ Loop A Jet Pump Flow 2B21-R611A 5.6 Mlb/hr
- ♦ Loop B Jet Pump Flow 2B21-R611B 12.8 Mlb/hr

Given these current conditions, which ONE of the following is correct?

A✓ Core Flow recorder indication is NOT correct.

"A" and "B" jet pump flows should be summed to obtain an accurate core flow rate.

B. Core Flow recorder indication is NOT correct.

"A" jet pump flow must be added to the recorder flow to obtain an actual core flow rate.

C. Core Flow recorder indication is correct.

"A" jet pump flow is being subtracted.

D. Core Flow recorder indication is correct.

"A" jet pump flow is NOT being subtracted.

38. **Unit 1** is operating at 100% power with all systems in their normal alignment. While the operator was swapping RBCCW pumps, the following alarms were received:

**600V BUS 1D BREAKER TRIPPED, 652-318**  
**600V BUS 1D UNDERVOLTAGE, 652-323**

The breaker for the faulted pump motor was subsequently disconnected and the 600V bus was re-energized from its normal supply within 10 minutes of the alarm (no other actions have been taken).

Given these plant conditions, which ONE of the following identifies the current status of the 240V DC Vital AC Battery System and the appropriate operator recovery actions?

- A. The battery is supplying the vital AC loads.  
The battery charger supply breaker can be immediately re-closed.
- B✓ The battery is supplying the vital AC loads.  
The non-essential load lockout reset pushbutton must be depressed before re-closing the battery charger supply breaker.
- C. The battery is NOT supplying the vital AC loads.  
The battery charger supply breaker is tripped and can be immediately re-closed.
- D. The battery is NOT supplying the vital AC loads.  
The battery charger supply breaker is closed.  
The inverter should be transferred back to its normal supply.

39. **Unit 2** is operating at 100% power and the following alarm is received:

**STA SVC SWGR DC OFF (651-143)**

The operator determines that one of the four power available lights on the TOP row of the DC Control Power indicating lights at Panel 2H11-P651 is EXTINGUISHED. (the other lights are illuminated)

Based on these conditions, which ONE of the following is correct?

- A✓ NONE of the 4KV circuit breakers will work on one bus.
- B. One 4KV bus is de-energized.
- C. NONE of the 600V circuit breakers will work on one bus.
- D. One 600V bus is de-energized.

40. **Unit 1** is operating with the following conditions:

- ♦ APRM Power: 20-21%
- ♦ Feedwater Temperature: 240 °F
- ♦ Turbine 1st stage pressure: < 25% power pressure equivalent
- ♦ Generator Load: 85 MW(e)

Because of emergent problems with the generator voltage regulator system, the operator manually trips the turbine.

Which ONE of the following predicts how the feedwater temperature will change once the turbine is tripped, including the reason for the change?

Feedwater temperature will....

- A✓ lower because the control valves closed.
- B. lower because the reactor scrammed.
- C. rise because of more heat load on the condenser.
- D. rise because the ultra-sonic temperature transducers see laminar flow.

41. **Unit 2** was operating at 100% for one year when a spurious scram occurred due to surveillance testing. The following conditions exist five minutes after the scram:

- ♦ All rods fully inserted
- ♦ MSIVs open
- ♦ Auxiliary steam loads still in service

Which ONE of the following is the expected bypass valve position and the corresponding inventory makeup that is required to maintain level constant within the normal level band?

- A. 1 bypass valve will be fully open  
The required makeup exceeds the capacity of one CRD pump
- B. 1 bypass valve will be controlling, varying between 0 - 50% open  
The required makeup is within the capacity of one CRD pump
- C✓ 1 bypass valve will be controlling, varying between 0 - 50% open  
The required makeup exceeds the capacity of one CRD pump
- D. 1 bypass valve will be fully open  
The required makeup is within the capacity of one CRD pump

42. **Unit 2** is at 99% power, ascending to rated power following a plant startup when the following alarm is received:

**REACTOR VESSEL PRESSURE HIGH (603 -114)**

Which ONE of the following identifies the alarm setpoint and the required EHC pressure set?

The alarm setpoint is \_\_\_\_\_ psig.

For this power level, EHC pressure set should be set to approximately \_\_\_\_\_ psig.

- A✓ 1055, 945
- B. 1055, 1040
- C. 1064, 945
- D. 1064, 1040

43. **Unit 1** was initially operating with drywell temperature steady at 135 °F with six drywell cooler fans running and six fans in AUTO not running. Subsequently, a complete loss of offsite power occurred and the lowest RPV level reached during the transient was Level -35 inches.

The following plant conditions currently exist:

- ♦ CRD and RCIC are controlling level at 33"
- ♦ RPV pressure at 850 psig, being controlled by HPCI & SRVs
- ♦ Drywell pressure at 1.2 psig
- ♦ Drywell temperature at 140°F
- ♦ Diesels are tied to their 4160 V busses

Which ONE of the following is the current status of the drywell cooling unit fans?

- A✓ More drywell cooling fans are running than before the loss of offsite power.
- B. The same number of drywell cooling fans are currently running now as compared to before the loss of offsite power.
- C. Some of the drywell cooling fans are currently running; however, the number of drywell cooling fans running is less than before the loss of offsite power.
- D. None of the drywell cooling fans are currently running.

44. The **Unit 1** HPCI Pump Operability surveillance test (34SV-E41-002-1) is in progress with the following conditions:

- ♦ Torus temperature is 92°F and increasing at 0.5°F/min
- ♦ Engineering has requested that the run be extended for 30 minutes to complete the system walk down
- ♦ The current time is: 1400

Given these conditions, SELECT the time that HPCI MUST be stopped to minimize heating of the suppression pool water and the required actions that the crew must perform?

HPCI is required to be stopped at time \_\_\_\_\_.

Following HPCI termination, \_\_\_\_\_ of RHR in suppression pool cooling is/are required to be in service in accordance with procedures.

- A. 1416  
Only One loop
- B. 1426  
Only One loop
- C. 1416  
Both loops
- D✓ 1426  
Both loops

45. A heatup and pressurization is in progress on **Unit 1** with reactor pressure at 75 psig. Reactor water level is being maintained with RWCU & CRD. IRMs are on range 7 and 8. The following lineup currently exists:

- ♦ The condensate and feedwater system is in LONG CYCLE cleanup
- ♦ SULCV F212 is CLOSED, i.e., C32-R619 controller in MANUAL with output at 0"
- ♦ SULCV upstream isolation valve (F036) is OPEN
- ♦ SULCV bypass valve (F406) is OPEN

As the operator opens the FW to Rx Isolation Valves (1N21-F006A & B) in preparation for low pressure feedwater injection, the "C" IRM high high setpoint is reached and the following alarms are received:

- ♦ **REACTOR NEUTRON MONITORING SYS TRIP** (603-109)
- ♦ **REACTOR AUTO SCRAM SYSTEM A TRIP** (603-117)
- ♦ **IRM BUS A UPSCALE TRIP OR INOP** (603-203)
- ♦ **IRM UPSCALE** (603-221)

Given these conditions, which ONE of the following valves is required to be closed to mitigate the reactivity excursion?

- A. Feedwater Cleanup Recirc FCV (1N21-F165)
- B. Condensate Demineralizer Bypass valve (1N21-F014)
- C. Startup LCV isolation valve (1N21-F036)
- D✓ Startup LCV Bypass valve (1N21-F406)



46. A group 1 isolation due to a steam leak occurred on **Unit 2** and most control rods failed to insert. (i.e., an ATWS has occurred.) RPV level was lowered in accordance with 31EO-EOP-113-2, Terminating and Preventing Injection to the RPV. SLC was injected due to torus temperature.

The SLC tank level has reached 34% and RPV level is now -35". As level is being raised to the normal level band, the operator receives the following alarms/indications:

- ◆ **IRM UPSCALE** (603-221-1) alarm is illuminated
- ◆ **IRM BUS A & B UPSCALE TRIP OR INOP** (603-203 & 212) both illuminated
- ◆ **SRM PERIOD** (603-231) alarm is illuminated
- ◆ APRM DOWNSCALE (603-228) alarm is extinguished
- ◆ APRM ODAs at 11% power
- ◆ Suppression Pool Temperature is 120°F

Which ONE of the following actions should be taken?

[Reference Provided]

- A✓ Terminate and prevent injection per 31EO-EOP-113-2.
- B. Continue to raise RPV water level to +3" to +50."
- C. Stop raising RPV water level and maintain -34" as the upper level limit.
- D. Stop raising RPV water level and re-inject only if RPV level lowers to -60."

47. The control room has been abandoned and 31RS-OPS-001-2, Shutdown From Outside Control Room, is being implemented. All RSDP transfer switches have been placed in the EMERGENCY position.

Which ONE of the following will correctly complete the statement below for water level control using RCIC?

At the **Unit 2** remote shutdown panel, if reactor water level decreases to -35 inches RCIC \_\_\_\_\_ automatically start. If reactor water level increases to 52 inches RCIC Steam Supply valve, 2E51-F045, \_\_\_\_\_ automatically close.

- A. will / will
- B. will / will NOT
- C. will NOT / will
- D✓ will NOT / will NOT

48. Primary containment conditions require venting in accordance with path G-1, left most leg, of the Primary Containment Gas Control flowchart (PCG).

Which ONE of the following describes the preferred method for removing combustible gases and when must this release be secured?

Vent the \_\_\_\_\_. Secure the venting only if the projected TEDE reaches \_\_\_\_\_ mR/hr

- A. drywell, 0.057
- B. drywell, 1000
- C✓ torus, 0.057
- D. torus, 1000

49. **Unit 2** has been operating for 87 days at 100% power and all equipment is normally aligned.

A fire occurs in the 2C 600VAC switchgear causing the bus to be de-energized and the earliest time to re-energize the bus is 2 hours.

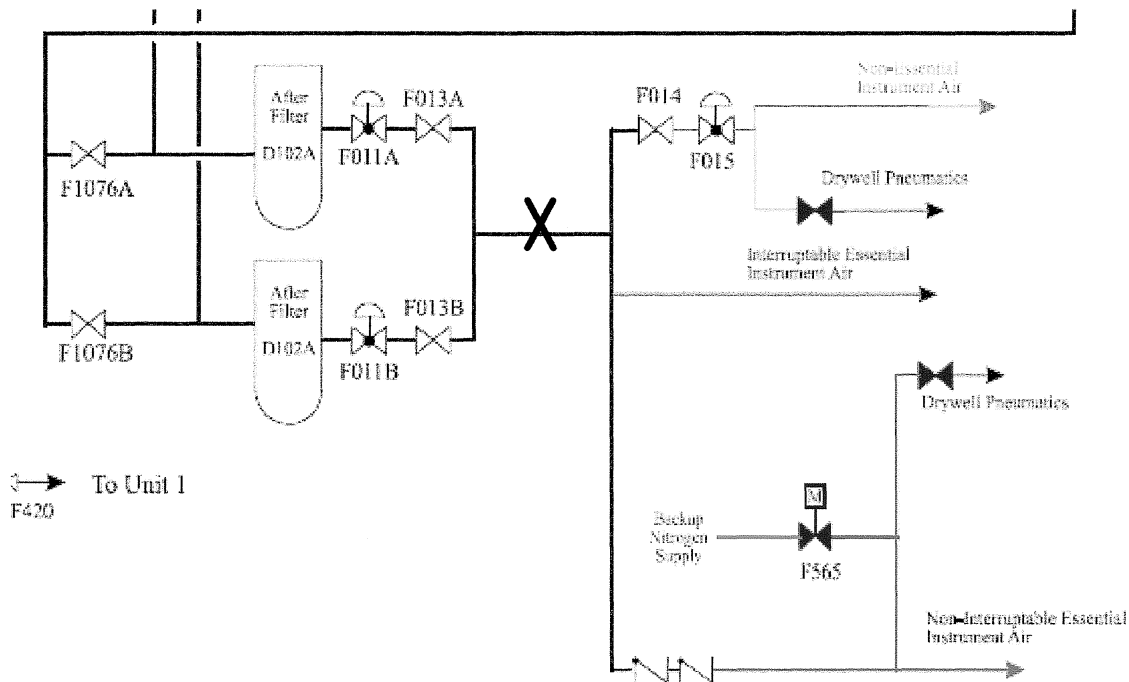
Which ONE of the following identifies a parameter that will be affected, including a required corrective action associated with this parameter, in accordance with 34AB-P42-001-2, Loss of Reactor Building Closed Cooling Water (RBCCW)?

- A✓ RBCCW flow inside the containment is inadequate.  
A manual scram is required.
- B. RBCCW surge tank level will lower.  
Local use of the 2P42-F055, level control valve bypass valve is required to raise level.
- C. RBCCW temperature will rise.  
The standby RBCCW pump must be started.
- D. RBCCW pressure will lower and then stabilize.  
The standby PSW pump should be manually started until the bus is re-energized.

50. A total loss of Instrument Air occurs on **Unit 2** from a break as shown by the "X."

Which ONE of the following describes how this loss of Instrument Air will affect the following plant components?

All other systems respond as designed.



The **Unit 2**...

- A. condensate demineralizer outlet valves will fail closed
- B. outboard MSIVs fail closed.
- C. fuel pool to transfer canal gate seals (inner and outer) will depressurize.
- D. radwaste ventilation dampers will fail closed.

51. **Unit 1** is in Mode 4 preparing for startup after a forced mid-cycle shutdown with the following conditions:

- RHR Loop "B" is in Shutdown Cooling w/ 7900 gpm
- Both Recirc Pumps OFF w/ discharge valves closed and suction valves open
- 1E41-R605, RHR Water Temp on Panel 1H11-P614 is 185°F
- RWCU Inlet temperature is 187°F
- RPV level is 37"

As the operator was performing a surveillance on the "1B" Recirc Pump discharge valve, the valve opened as required but would not re-close. The auxiliary operator is currently investigating the valve motor breaker.

Given these plant conditions, which ONE of the following describes how this valve being open will affect RWCU and RHR temperatures?

Actual core coolant temperature will \_\_\_\_\_.  
RHR heat exchanger inlet water temperature will \_\_\_\_\_.

- A✓ rise / lower
- B. remain the same / lower
- C. rise / rise
- D. remain the same / rise

52. If a loss of both CRD pumps occurred, while a control rod accumulator is unavailable, the scram insertion time for that rod would be \_\_\_\_\_ if reactor pressure was \_\_\_\_\_ psig as compared to \_\_\_\_\_ psig.

- A✓ shorter  
1000 / 800
- B. shorter  
200 / 800
- C. longer  
1000 / 600
- D. longer  
1000 / 200

53. During refueling operations, a spent bundle was being lowered into the fuel rack using the main fuel grapple. When the bundle was seated in the fuel rack, the operator could not get the grapple to release the bundle despite repeated operation of the grapple open/close switch. The operator then raised the bundle with the intention of rotating it 90 degrees and lowering it again.

When the operator started to lower the bundle (after rotating it) the bundle hung up on the fuel rack, i.e., did not slide into the slot. When the bundle hung up on the fuel rack, the grapple opened. The operator then noticed that the bundle proceeded to tip away from the mast and fall across other irradiated fuel storage racks in the spent fuel pool.

Given this information, which ONE of the following fuel handling equipment problems caused the grapple hook to open?

- A. Loss of air pressure to the refueling platform
- B✓ Grapple open/closed switch left in the open position
- C. System Stop pushbutton was depressed when the hoist jam light illuminated
- D. Loss of electrical power to the refueling platform

54. Following a LOCA on **Unit 1**, the crew has determined that the following containment parameters have increased to and stabilized at the following values:

- ♦ Drywell pressure ..... 48 psig
- ♦ Torus pressure..... 44 psig
- ♦ Torus level ..... 20 feet

Which ONE of the following is an operational implication of these containment parameters?

- A. Torus venting will occur at this time if the T48-F326 and -F318 valves are opened in accordance with 31EO-EOP-101-1, Emergency Containment Venting.
- B. The pneumatic operators on the drywell vent valves T48-F320 and -F319 cannot physically function due to high drywell pressure regardless of interlocks.
- C. The pneumatic operators on the safety relief valves cannot physically function due to high drywell pressure regardless of reactor pressure.
- D✓ After the drywell is vented in accordance with 31EO-EOP-101-1, Emergency Containment Venting, the RHR and Core Spray NPSH will be less.

55. A spurious group 1 isolation occurred on **Unit 1**. The following conditions were noted (not all alarms are listed):

- ♦ All control rods did NOT insert
- ♦ Reactor Power is 17%
- ♦ "Safety/Blowdown Valve Leaking" alarm received
- ♦ 4 SRV amber lights are lit

All other systems responded as designed.

During the transient, the following sequence of RPV pressures occurred:

- ♦ pressure peaked at 1125 psig
- ♦ pressure decreased to 870 psig
- ♦ pressure then increased slowly over ten minutes to its current value of 1000 psig

Assuming no operator action, which ONE of the following is correct at the SRV Tailpipe Temperature recorder (1B21-R614) located at panel H11-P614?

\_\_\_\_\_ tailpipe temperatures are approximately \_\_\_\_\_ and stable.

[Reference provided]

A✓ Two; 380 deg

B. Four; 550 deg

C. Four; 380 deg

D. Two; 550 deg

56.

An RHR pump is currently operating at the net positive suction head (NPSH) limit.

Which ONE of the following describes how torus pressure and torus temperature impact RHR pump operation?

As torus pressure decreases, the EOP NPSH limit becomes \_\_\_\_\_ making cavitation \_\_\_\_\_ likely for a given torus temperature and pump flow rate.

- A. less restrictive/ less
- B. less restrictive / more
- C. more restrictive / less
- D✓ more restrictive / more

57. Which ONE of the following is the basis for the sloping portion of the Boron Injection Initiation Temperature (BIIT) limit curve and one of the required actions to be taken before this limit is reached?

- A. Ensures that the suppression pool Tech Spec temperature will NOT be exceeded.

Initiate a manual scram per placard RC-1

- B. Ensures Cold Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate SBLC per 34SO-C41-003-1

- C✓ Ensures Hot Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate SBLC per 34SO-C41-003-1

- D. Ensures Cold Shutdown boron weight is injected before the torus heat capacity is exceeded.

Initiate a manual scram per placard RC-1

58. A small break LOCA occurred and the drywell chillers are tripped and cannot be re-started. Drywell Sprays have already been initiated and stopped once; however, the containment temperature is slowly rising again. The following conditions currently exist on **Unit 2**:

- |                     |                 |
|---------------------|-----------------|
| ♦ Drywell pressure  | 7 psig          |
| ♦ RPV water level   | 32" and steady  |
| ♦ Reactor Pressure  | 300 psig        |
| ♦ Torus Water Level | 148" and steady |

Which ONE of the following identifies when drywell sprays are initially required to be initiated in accordance with the primary containment control procedure and also identifies when sprays are allowed to be re-initiated given the current plant conditions?

[Reference provided]

- A. Drywell sprays are required to be initiated BEFORE the average of all the drywell temperature points reaches 280 °F

Drywell temperature at 300 °F and slowly rising

- B. Drywell sprays are required to be initiated BEFORE the average of all the drywell temperature points reaches 280 °F

Because curve 8 was already evaluated the first time sprays were initiated, sprays may be re-initiated a second time without re-evaluating temperature on curve 8.

- C✓ Drywell sprays are required to be initiated BEFORE the average of all the drywell temperature points reaches 340 °F

Drywell temperature at 225°F and slowly rising

- D. Drywell sprays are required to be initiated BEFORE the average of both the drywell and torus air temperature points reaches 340 °F

Because curve 8 was already evaluated the first time sprays were initiated, sprays may be re-initiated a second time without re-evaluating temperature on curve 8.



59. An event has occurred on **Unit 2** resulting in the following conditions:

- ♦ 4160V Buses 2A and 2B are de-energized
- ♦ RPV Pressure..... 950 psig
- ♦ RPV Water Level..... 30 inches being controlled with CRD
- ♦ Torus Water Level....55 inches

Given these conditions, which ONE of the following systems is required to be used if the reactor must be emergency depressurized?

- A. Safety relief valves
- B. Bypass valves
- C✓ RCIC in pressure control mode
- D. HPCI in pressure control mode

60. Which ONE of the following annunciators being in an alarmed condition represents the lowest reactor water level on **Unit 1**?

- A. **ARI LEVEL 1 OR 2 INITIATED** (603-301)
- B. **REACTOR VESSEL LEVEL 2 DIVISION I TRIP** (603-205)
- C. **REACTOR VESSEL LOW LEVEL TRIP** (603-108)
- D✓ **RECIRC PMP A & B HI PRESS/LOW LVL TRIP** (602-120)

61. **Unit 2** is operating at 100% power when a scram signal occurs. Many control rods remain withdrawn after the reactor mode switch is placed in the shutdown position.

The following plant conditions currently exist:

- ♦ APRM power 24%
- ♦ RPV level 36"
- ♦ Reactor Mode Switch is in REFUEL
- ♦ The operator inadvertently skips a procedure step and the RWM is NOT bypassed
- ♦ The RWM is not in sequence control mode
- ♦ All other EOP procedure steps to prepare for driving control rods have been completed

Which ONE of the following choices identifies the rod movement switch(es) that will cause a control rod to insert if the operator selects and attempts to insert a peripheral control rod with an insert limit of 18?

Control rods can be inserted using \_\_\_\_\_.

When the control rod reaches a RWM insert limit, the control rod will \_\_\_\_\_.

- A. the Emergency In switch ONLY  
automatically stop moving
- B. either the normal Rod Movement Control switch or the Emergency In switch  
automatically stop moving
- C. the Emergency In switch ONLY  
continue moving in to the full in position
- D✓ either the normal Rod Movement Control switch or the Emergency In switch  
continue moving in to the full in position

62. A plant event occurred and an alert has been declared by the shift manager. The control room operator is performing a prompt offsite dose assessment in accordance with 73EP-EIP-005-0, On Shift Operations Personnel Emergency Duties and 73EP-EIP-018-0, Prompt Offsite Dose Assessment.

While the control operator is gathering the TRN-0052 meteorological data, he notes that the 100 meter wind speed data from the primary meteorological tower is 40 mph at 90°.

Which ONE of the following describes the release point being assessed and the wind direction?

- A. 100 meters is a primary data point used for an ELEVATED RELEASE  
90° means that the wind is blowing towards the east
- B✓ 100 meters is a primary data point used for an ELEVATED RELEASE  
90° means that winds are coming from the east
- C. 100 meters is a primary data point for a GROUND RELEASE  
90° means that the wind is blowing towards the east
- D. 100 meters is a primary data point for a GROUND RELEASE  
90° means that winds are coming from the east

63. Which ONE of the following describes when a nitrogen pneumatic supply is automatically provided to the Non-interruptible essential air loads on **Unit 1**?

- A. Only one pneumatically operated valve auto-opens at 80 psig.
- B. Only one motor operated valve auto-opens at 80 psig.
- C. Five pneumatically operated valves open. Four valves auto-open at 90 psig and one valve auto-opens at 80 psig.
- D✓ Five motor operated valves open. Four valves auto-open at 90 psig and one valve auto-opens at 80 psig.

64. **Unit 1** is at 100% power with the "A" and "C" RBCCW pumps in service. The "B" RBCCW pump is out of service for maintenance. All other systems are in their normal alignment.

Which ONE of the following will occur if the 600VAC Bus D trips and locks out due to an electrical fault?

- A. Recirc MG set oil temperatures will rise.  
Fuel Pool temperature will rise.
- B. Recirc MG set oil temperatures will rise.  
Fuel Pool temperature will remain the same.
- C. Recirc MG set oil temperatures will remain the same.  
Fuel Pool temperature will rise.
- D✓ Recirc MG set oil temperatures will remain the same.  
Fuel Pool temperature will remain the same.

65. The Unit 1 reactor operator receives a fire alarm annunciator (651-160). The following line is observed on the control room CRT 1Z43-R404CX:

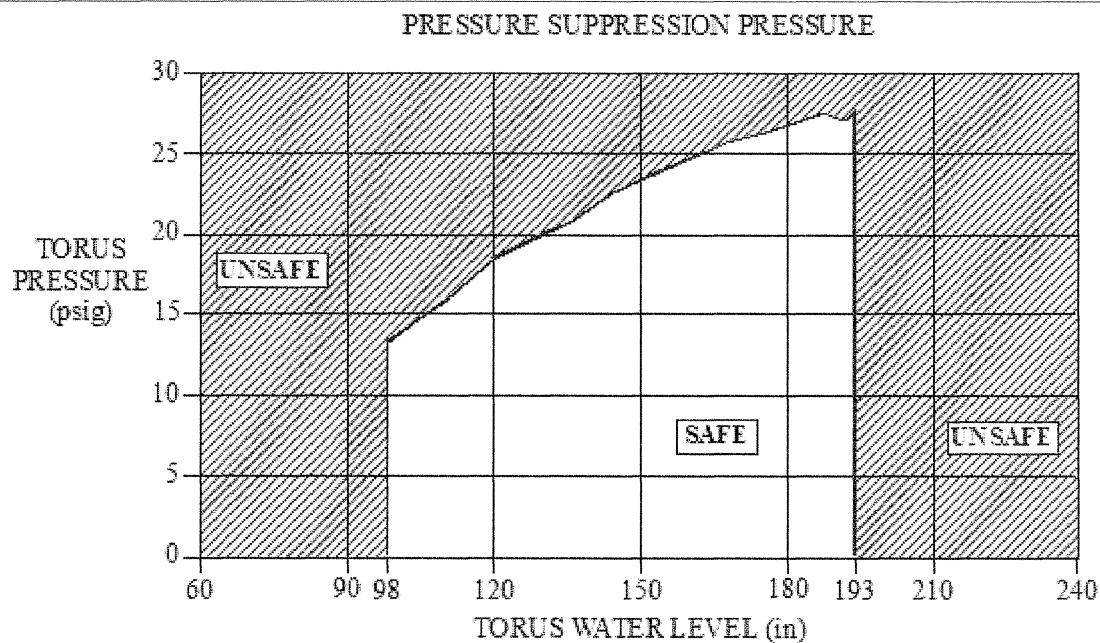
**1T43087D02 E Torus Wtr Curtain Alarm**

Assuming this area is the 87' elevation, which ONE (1) of the following identifies whether sprinkler flow will occur in this area and if the fire brigade is required to be dispatched in accordance with the Fire Alarm ARP?

<u>Sprinkler Flow</u>	<u>Action Required</u>
A. Sprinkler flow will occur even if a heat source does not exist.	Fire Brigade is NOT immediately dispatched.
B. Sprinkler flow occurs ONLY with a heat source.	Immediately dispatch the Fire Brigade before confirming a fire.
C. Sprinkler flow will occur even if a heat source does not exist.	Immediately dispatch the Fire Brigade before confirming a fire.
D✓ Sprinkler flow occurs ONLY with a heat source.	Fire Brigade is NOT immediately dispatched.

66. Which ONE of the following identifies when a paper copy of 34SV-SUV-019-1/2, Surveillance Checks, is required to be used instead of the computerized rounds software?

- A. If more than one operator is collecting the data
- B. If the order of station readings will be altered
- C✓ If a mode change will occur
- D. If an abnormal or out of spec reading is collected



67.

Which ONE of the following components corresponds to the torus water level limit of 193" in graph 7, Pressure Suppression Pressure?

- A. Top of the torus-to-drywell vacuum breakers
- B✓ Bottom of torus ring header
- C. Control room torus water level indicator is at the top of the band
- D. Control room torus pressure instrument tap becomes covered

68.

<b>Temporary Modification Tag</b>
Temporary Modification No. _____ Tag No. _____
Name of Person Attaching Tag _____ Date _____
Affected Component System _____
_____
_____
Connection Point(s) _____
705981 H1

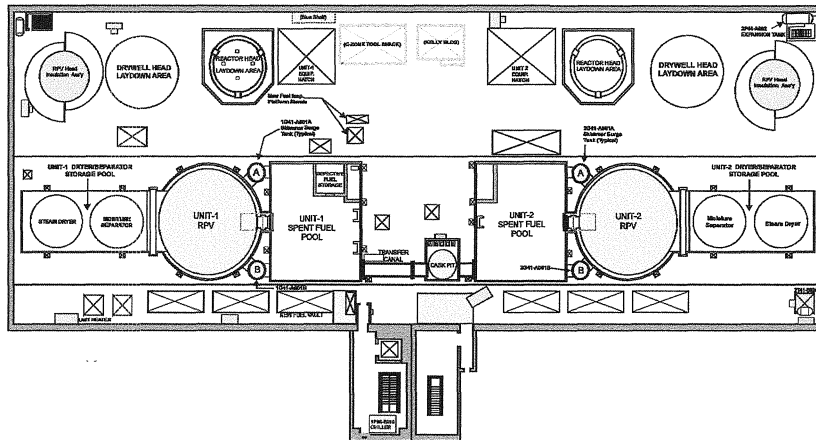
Which ONE of the following component changes requires this tag to be hung in accordance with 40AC-ENG-018-0, Temporary Modification Control?

- A. An annunciator card that has been pulled to disable an alarm.
- B✓ An additional breaker is added to a local electrical panel to supply power to a temporary welding machine.
- C. A hose is temporarily routed from a plant service air connection to a pneumatic diaphragm pump.
- D. A hose is temporarily routed from a drain line on a pipe for a local leak rate test.

69. An operator on the **Unit 2** Bridge observes two fuel bundles in the normal fuel storage section of the **Unit 2** fuel pool.

Bundle 1's channel fastener is pointed in the direction between the **Unit 1** reactor and **Unit 1** CST.

Bundle 2's channel fastener is pointed in the direction between the **Unit 2** reactor and **Unit 2** CST.



Which ONE of the following describes the orientation of these two bundles in accordance with 34FH-OPS-001-0, Fuel Movement Operation?

- A. Bundle 1 is oriented correctly.  
Bundle 2 is oriented INCORRECTLY.
- B. Bundle 1 is oriented INCORRECTLY.  
Bundle 2 is oriented correctly.
- C✓ Both bundles are oriented INCORRECTLY.
- D. Both bundles are oriented correctly.

70. Which ONE of the following describes the unit differences for the Reactor Building Remote Shutdown Panel(s) (RSDP) emergency transfer switches?

With an emergency transfer switch in the \_\_\_\_\_ position for \_\_\_\_\_ , equipment can be operated from BOTH the MCR AND the RSDP.

- A. NORM / Unit 2
- B. EMER / Unit 1
- C✓ NORM / Unit 1
- D. EMER / Unit 2



71. **Unit 1** was initially operating at reduced power with one control rod inserted due to a leaking fuel bundle. Subsequently, the main steam line radiation levels began rising to a point where the crew was required to manually scram and manually close the group 1 isolation valves.

Given this plant condition, which ONE of the following describes the required action(s) in accordance with 34AB-B21-001-1, Main Steam Line High Rad or Suspected Fuel Element Failure?

- A✓ Open the condenser vacuum breakers and then re-close vacuum breakers when vacuum reaches 3 " hg.

The Main Control Room HVAC is required to be manually started in the pressurization mode.

- B. Open the condenser vacuum breakers and then re-close vacuum breakers when vacuum reaches 3 " hg.

The Main Control Room HVAC is NOT required to be manually placed in the pressurization mode.

- C. Open the Main Condenser vacuum breaker valves WHEN Turbine speed is less than 1200 RPM OR steam seal pressure reaches 0 PSIG. Maintain the vacuum breakers open.

The Main Control Room HVAC is required to be manually started in the pressurization mode.

- D. Open the Main Condenser vacuum breaker valves WHEN Turbine speed is less than 1200 RPM OR steam seal pressure reaches 0 PSIG. Maintain the vacuum breakers open.

The Main Control Room HVAC is NOT required to be manually placed in the pressurization mode.

72. An new employee at Plant Hatch told the Health Physics (HP) personnel that he has an estimated dose of 1.5 rem Total Effective Dose Equivalent (TEDE) exposure for this year. The HP personnel have documented the estimate in the employees records.

Which ONE of the following is the maximum amount of time this employee can work in a 100 mr/hr general area field without exceeding the TEDE administrative limit in accordance with 60AC-HPX-001-0, Radiation Exposure Limits?

ASSUME NO EXTENSIONS ARE APPROVED

- A. 2 hours
- B. 4 hours
- C✓ 5 hours
- D. 10 hours

73. An Emergency Classification has been declared on **Unit 1** due to a primary system leak.

Given the following prompt offsite dose results, which ONE of the following is the LOWEST dose rate that meets the criteria for "Release is Underway" in accordance with 73EP-EIP-018-0, Prompt Offsite Dose Assessment?

- A. 1 E-3 mr/hr
- B✓ 1 E-2 mr/hr
- C. 5.7 E-2 mr/hr
- D. 5.7 E-1 mr/hr

74. Which ONE of the following describes the meaning of a white plastic frame being installed on an annunciator at the Reactor / Containment Cooling and Isolation panel 2H11-P601?

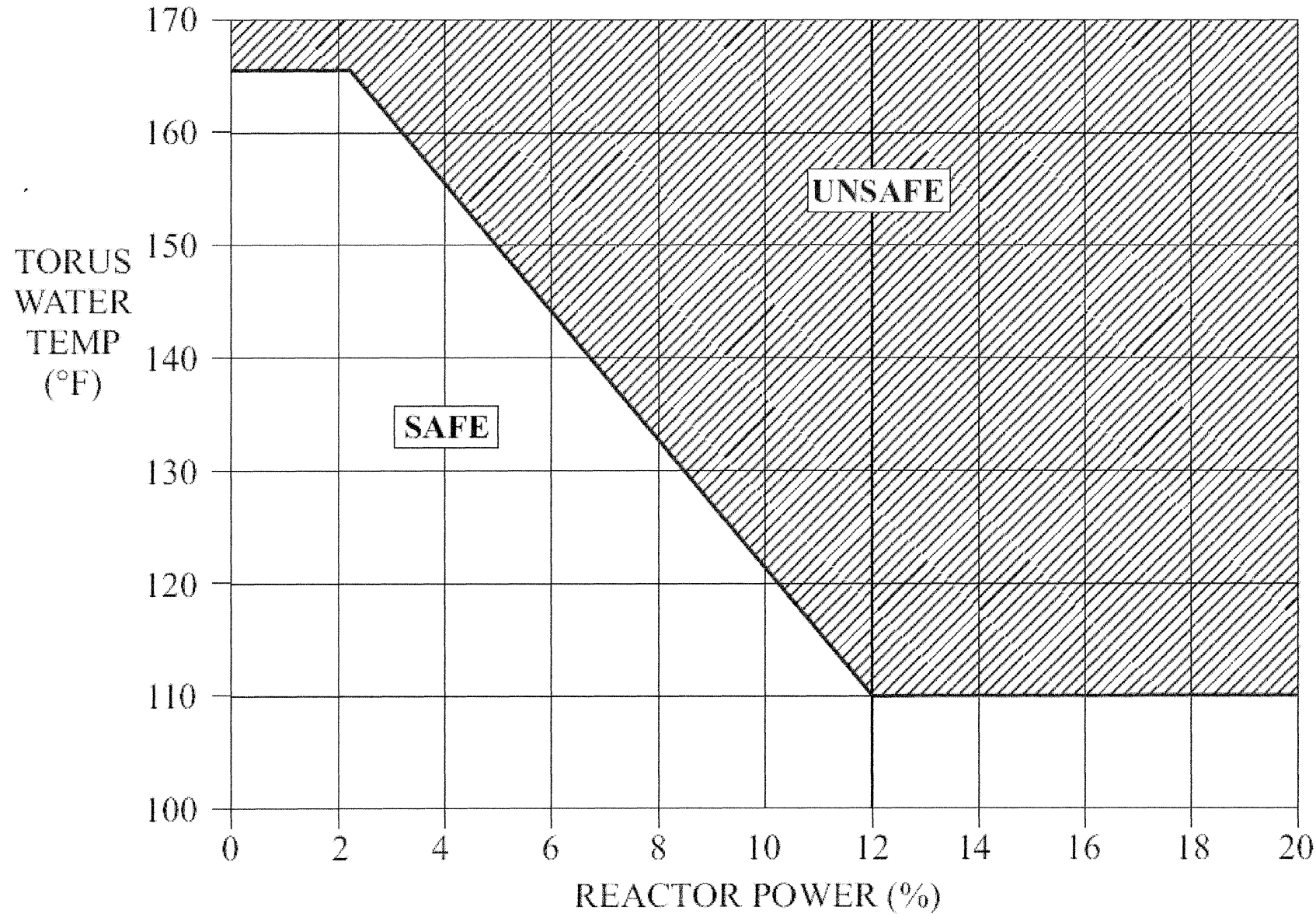
The white plastic frame means that the annunciator:

- A. is the result of some plant evolution that is both known and expected by the operating crew, i.e., expected alarm flag.
- B. has been disabled, i.e., "card is pulled."
- C. indicates an entry condition for 31EO-EOP-010-1, RC/RPV Control.
- D✓ is an indicator of a potential radiological condition.

75. Which ONE of the following describes a condition where a plant parameter is approaching a value that warrants rapidly depressurizing the RPV to the main condenser using the bypass valves, irrespective of the cooldown rate, including the basis for this action?

- A. Reactor water level decreasing due to a loss of high pressure injection (still > TAF)  
Basis: Preserves the heat capacity of the torus for as long as possible.
- B. Reactor water level decreasing due to a loss of high pressure injection (still > TAF)  
Basis: Maintains the level instruments with reference legs inside containment operable.
- C✓ Drywell temperature increasing due to the inability to spray the drywell. (still < 340)  
Basis: Preserves the heat capacity of the torus for as long as possible.
- D. Drywell temperature increasing due to the inability to spray the drywell. (still < 340)  
Basis: Maintains the level instruments with reference legs inside containment operable.

# BORON INJECTION INITIATION TEMPERATURE



NOTE: May use SPDS Emergency Displays in place of this Graph.

DOCUMENT TITLE:  
AUTOMATIC DEPRESSURIZATION (ADS) AND  
LOW-LOW SET (LLS) SYSTEMS

DOCUMENT NUMBER:  
34SO-B21-001-1

VERSION NO:  
12.6

### 7.2.3 Automatic Initiation of LLS

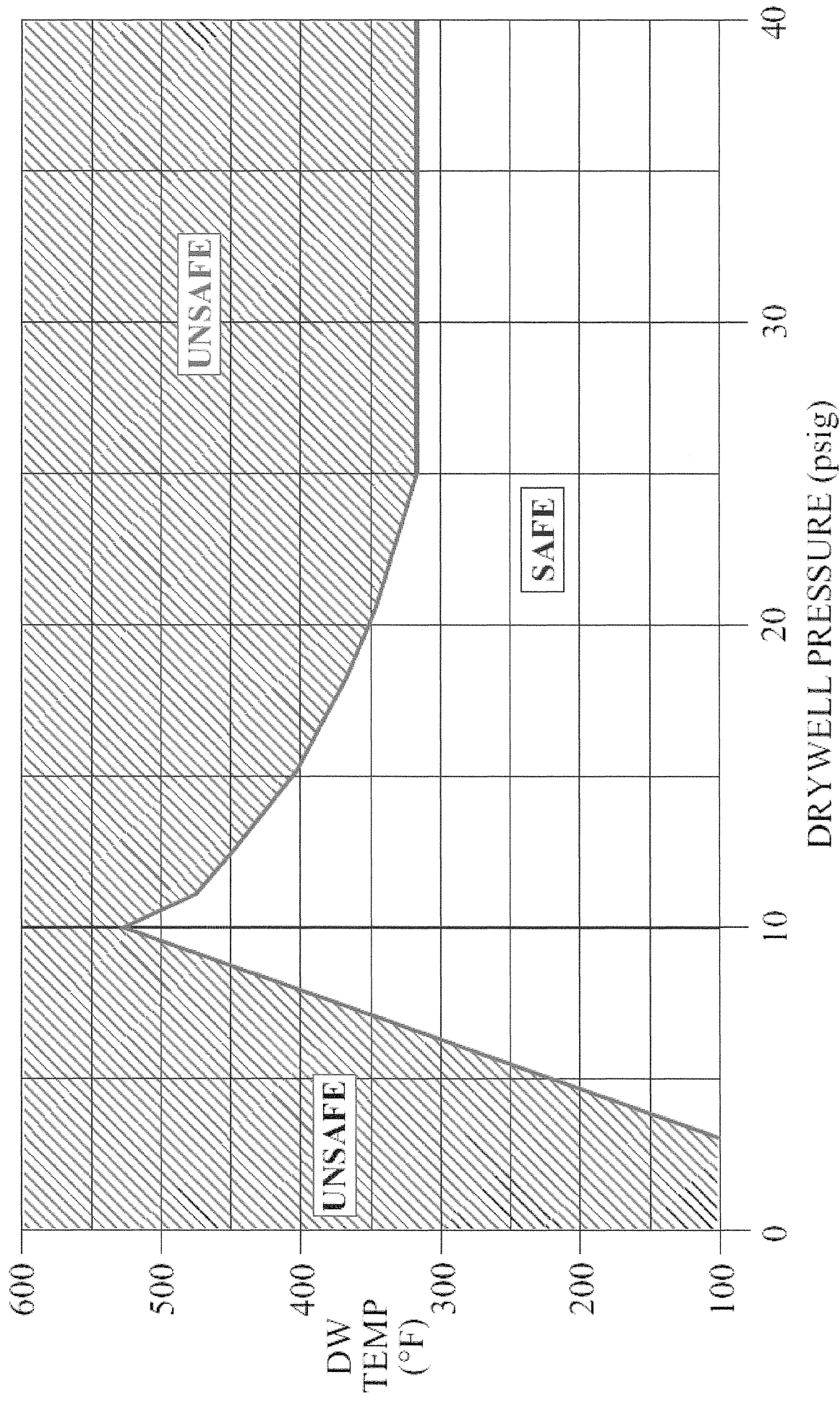
#### CONTINUOUS

#### NOTES:

- LLS logic requires the following TWO initiating conditions:
  - 1) Reactor pressure > 1074 PSIG.
  - 2) Any of the following safety relief valves has opened AND has a tailpipe press  $\geq$  85 PSIG:
    - (a) Electrical Setpoint 1120 PSIG: 1B21-F013A  
1B21-F013C  
1B21-F013G  
1B21-F013H
    - (b) Electrical Setpoint 1130 PSIG: 1B21-F013D  
1B21-F013F  
1B21-F013L  
1B21-F013K
    - (c) Electrical Setpoint 1140 PSIG: 1B21-F013B  
1B21-F013E  
1B21-F013J
    - (d) Mechanical Setpoint 1150 PSIG for ALL SRVs.
- Once initiated, LLS will control reactor pressure by cycling 1B21-F013A, C, G, H at the following pressures:
 

<u>VALVE</u>	<u>OPEN</u>	<u>CLOSE</u>
1B21-F013C	1033 PSIG	887 PSIG
1B21-F013G	1023 PSIG	877 PSIG
1B21-F013A	1008 PSIG	862 PSIG
1B21-F013H	993 PSIG	847 PSIG
- The RED indicator light for SRV shows ONLY that the actuating solenoid is energized. It is NOT positive indication of valve position. The RED light will be illuminated only when the electrical signal is present to open the SRV.
- The GREEN indicator light for SRV will not extinguish during LLS Actuation.
- The YELLOW indicator light for SRV indicates the Tailpipe Pressure switch has reached its setpoint.
- In the event of a reactor vessel flooding incident, the temperature/pressure associated with a water environment may not actuate the 85 psig pressure switches as normally expected with an SRV open demand present. Operator action for failure OR apparent failure of SRV's should be to enter 34AB-B21-003-1, Failure Of Safety/Relief Valves.

DRYWELL SPRAY INITIATION LIMIT



NOTE: May use SPDS Emergency Displays in place of this Graph.