

SUBJECTIVE SCORE INSTRUCTOR USE ONLY

100	90	80	70	60
50	40	30	20	10
9	8	7	6	5
4	3	2	1	0

(T) (F) KEY

FORM NO. 888-E

IMPORTANT

TO USE SUBJECTIVE SCORE FEATURE:

- Mark total possible subjective points
- Only one mark per line on key
- 163 points maximum

EXAMPLE OF STUDENT SCORE

1	2	3	4	5
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
10	10	10	10	10
11	11	11	11	11
12	12	12	12	12
13	13	13	13	13
14	14	14	14	14
15	15	15	15	15
16	16	16	16	16
17	17	17	17	17
18	18	18	18	18
19	19	19	19	19
20	20	20	20	20
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41	41	41	41	41
42	42	42	42	42
43	43	43	43	43
44	44	44	44	44
45	45	45	45	45
46	46	46	46	46
47	47	47	47	47
48	48	48	48	48
49	49	49	49	49
50	50	50	50	50

PART 1

SCANTRON

FOR USE ON TEST SCORING MACHINE ONLY

NAME		
SUBJECT	TEST NO.	
DATE	PERIOD	

TEST RECORD	
PART 1	
PART 2	
TOTAL	

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FEED THIS DIRECTION

- 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
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- 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

Accept two answers





Accept two answers

IMPORTANT

TO USE SUBJECTIVE SCORE FEATURE

- Mark total possible subjective points
- Only one mark per line on key
- IE3 points maximum

TO USE OBJECTIVE SCORE FEATURE

- MAKE DARK MARKS
- ERASE COMPLETELY TO CHANGE
- EXAMPLE:  X  B  C  E

EXAMPLE OF STUDENT SCORE

1	2	3	4	5	6	7	8	9	10
1	1	1	1	1	1	1	1	1	1

PART 2

NAME	
SUBJECT	TEST NO.
DATE	PERIOD

TEST RECORD	
PART 1	
PART 2	
TOTAL	

- (T) (F) KEY
- 51 (A) (B) (C) (D) (E)
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- 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)
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- 99 (A) (B) (C) (D) (E)
- 100 (A) (B) (C) (D) (E)

↑ FEED THIS DIRECTION



2019 RBS NRC Examination

Examination Outline Cross Reference	Level	RO
203000 (SF2, SF4 RHR/LPCI) RHR/LPCI: Injection Mode Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Pumps	Tier	2
	Group #	1
	K/A	203000 K2.01
	Rating	3.5
	Revision	2
Revision Statement: Rev 1 Added “Division III Diesel Generator is tagged out” to stem of the question, and changed the word available to operating. Rev 2 Removed “Division III Diesel Generator is tagged out” and added distractor D. LPCS and HPCS		

Question: 1

The plant was operating at 100% power when a loss of offsite power occurred.

The following conditions exist:

- Drywell pressure is 1.93 psid
- Division I Diesel Generator has failed to start

Which Emergency Core Cooling System (ECCS) Pumps are currently operating?

- A. RHR B and RHR C
- B. RHR A and HPCS
- C. RHR C and LPCS
- D. LPCS and HPCS

Answer: A
Explanation: The question requires basic power supply knowledge of Safety related ECCS components. A loss of Offsite power concurrent with a failure of Div 1 diesel starting and Div 3 being tagged out would leave both of these buses without any power. Therefore, ONLY Div 2 ECCS components would still have AC power available.
Distracters: B.HPCS is a Div 3 component C.LPCS is a Div 1 component D. HPCS is a Div 3 component
K/A Match

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Applicant must have knowledge of power supplies to major safety related pumps.		
Technical References: R-STM-300 AOP-0004, Loss of Offsite Power		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0300-LO Obj.18 Given plant/system parameters determine the impact of the following on AC distribution, predict/determine AC. Distribution response and determine if procedural implementation is required. (18) Loss of Coolant Accident Loss of Off-site Power		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	X
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability: LOSP, Top Ten Internal Events contributing to baseline core damage frequency		

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Examination Outline Cross Reference	Level	RO
205000 (SF4 SCS) Shutdown Cooling Knowledge of the effect that a loss or malfunction of the following will have on the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE): (CFR: 41.7 / 45.7) K6.04 Abnormal Reactor Water Level	Tier	2
	Group #	1
	K/A	205000 K6.04
	Rating	3.6
	Revision	1
Revision Statement: Rev 1 Changed to RPV level from -120" to -150". This allowed removing "Arm and Depress" DIV I Initiation pushbutton from each distractor.		

Question: 2

The following plant conditions exist:

- The reactor is in cold shutdown
- RHR A is in shutdown cooling
- ENS-SWG1B is de-energized for maintenance

An RPV water level transient has resulted in RPV Level lowering to -150".

Which of the following actions result in RHR A injecting into the RPV in the LPCI Mode?

- A. ONLY close E12-MOVF006A, SDC Suction Valve.
- B. ONLY close E12-MOVF008, SDC Outboard Isolation Valve.
- C. Close E12-MOVF006A, SDC Suction Valve, and Open E12-MOVF004A, Suppression Pool Suction Valve.
- D. Close E12-MOVF008, SDC Outboard Isolation Valve, and Open E12-MOVF004A, Suppression Pool Suction Valve.

Answer: C
Explanation: RHR A was operating in shutdown cooling mode taking a suction from the reactor via E12-F009, E12-F008, E12-F006A. When reactor lowered below 9.7", F008 and F009 closed, but F006A stayed open because it doesn't receive an auto closure signal. LPCI mode requires a suppression pool suction flow path via the E12-F004A which is interlocked with the E12-F006A. Both valves cannot be open at the same time. The operator must manually close the F006A and then manually open the F004A. F004A

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<p>does not receive an auto open signal from the initiation signal. Reactor water level is currently -150" which is below the LPCI initiation setpoint of -143".</p>		
<p>Distracters: A.The operator would still have to establish a LPCI suction flow path by opening the E12-004A B.E12-MOVF008 would have auto closed when Reactor water level lowered below 9.7" D.E12-MOVF008 would have auto closed when Reactor water level lowered below 9.7"</p>		
<p>K/A Match Applicant must have knowledge of the shutdown cooling isolation signals based on reactor water level and which RHR valves would close.</p>		
<p>Technical References: R-STM-0204 RHR SYSTEM AOP-0003 AUTOMATIC ISOLATIONS</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0204-LO Obj.6 and 7 List the automatic functions and interlocks of the following Residual Heat Removal System components (6) RHR Pumps A/B/C (E12-C002A/C002B/C002C) RHR Shutdown Cooling Isolation Valves (E12-MOVF008/9) RHR Pump Suppression Pool Suction Valves (E12-MOVF004A/F004B/F105) RHR Pump A/B Shutdown Cooling Suction Valves (E12-MOVF008/9) RHR Pump Minimum Flow Valves (E12-MOVF064A/F064B/F021) RHR Heat Exchanger Bypass Valves (E12-F048A/F048B) RHR Suppression Pool Test Return Valves (E12-MOVF024A/F024B/F021) LPCI Injection Valves (E12-MOVF042A/F042B/F042C) RHR Outboard Isolation Valves (E12-MOVF027A/F027B) RHR Shutdown Cooling Valves (E12-MOVF053A/F053B) RHR to Upper Pool FPC Assist Valves (E12-MOVF037A/F037B) RHR to Radwaste Reject Valves (E12-MOVF040/F049)</p> <p>List the signals, including setpoints, that will cause an automatic isolation of the Residual Heat Removal System (7)</p>		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	

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	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
209001 (SF2, SF4 LPCS) Low Pressure Core Spray Knowledge of the physical connections and/or cause-effect relationships between LOW PRESSURE CORE SPRAY SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.05 Automatic depressurization system	Tier	2
	Group #	1
	K/A	209001 K1.05
	Rating	3.7
	Revision	3
Revision Statement: Rev 1 Removed the subset issue by asking for the minimum discharge pressure. Bolded the word “requires” in the stem. Rev 2 rewrote the question to raise the LOD Rev 3 changed distractor A to above Drywell Pressure 1.68		

Question: 3

Manual initiation of DIV I ADS requires arming and depressing the ADS Manual Initiation Switches (S30A/S31A) along with _____.

- A. Drywell Pressure being above 1.68 psid
- B. Reactor water level being below -143”
- C. LPCS operating with discharge pressure greater than 145 psig
- D. RHR C operating with discharge pressure greater than 135 psig

Answer: C

Explanation:

Manual initiation of the ADS bypasses the high drywell pressure (1.68 psid), the low reactor water Level 1 (-143”), the confirmatory low reactor water Level 3 (+9.7”), and the 105-second time delay initiation signals, but still requires that at least one low pressure ECCS pump be running in that Division. Due to the “two-out-of-two, once” logic, a minimum of two manual initiation pushbuttons must be actuated for manual ADS initiation. Either both pushbuttons in Channel “A” or both in Channel “B” must be armed and depressed. When ADS is manually initiated, the 105-second timers are bypassed, causing immediate initiation (no time delay).

Distractors:

- A.**This signal is bypassed by the Manual Initiation Switches
- B** This signal is bypassed by the Manual Initiation Switches
- D.**RHR C is a DIV 2 ECCS pump, DIV I ADS requires a DIV I ECCS pump

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K/A Match		
Applicant must have knowledge of how the LPCS system interfaces with the ADS system.		
Technical References:		
R-STM-0202 ADS system		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0202-LO Obj.6		
Describe the interrelationships between ADS and the following systems:		
LPCS System Pressure		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)7	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
209002 (SF2, SF4 HPCS) High Pressure Core Spray Knowledge of the effect that a loss or malfunction of the following will have on the HIGH PRESSURE CORE SPRAY SYSTEM (HPCS): (CFR: 41.7 / 45.7) K6.02 Condensate storage tank water level	Tier	2
	Group #	1
	K/A	209002 K6.02
	Rating	3.4
	Revision	1
Revision Statement: Rev 1 Removed “E22-F004, HPCS Injection Valve, has been manually overridden closed” from the stem of the question. Added picture of HPCS Level 8 light		

Question: 4

A Loss of Coolant Accident causes a start of the HPCS System with subsequent HPCS injection into the vessel.

Plant conditions are as follows:



- RPV Level is +50 inches and stable
- CST Level is 10 ft
- Suppression Pool Level is 19 ft. 6 in
- HPCS Pump is running on minimum flow

If RPV Level lowers to -50 inches and CST Level lowers to 2.2 ft,

What will be the final position of the following valves?

- E22-F015, HPCS Suppression Pool Suction Isolation Valve
- E22-F004, HPCS Injection Valve

- | | |
|-----------------|-----------------|
| <u>E22-F015</u> | <u>E22-F004</u> |
| A. open | open |
| B. open | closed |

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- C. closed open
- D. closed closed

Answer: A		
Explanation: The HPCS system automatically started and was injecting due the LOCA.. The picture of the HPCS water level 8 light being lit is indicative that a level 8 has occurred which cause E22-F004, HPCS Injection Valve to automatically close and the HPCS Pump will continue to operate in the min flow line up. RPV level lowering below - 43" would automatically reopen the HPCS Injection Valve. A low CST level below 2.4 ft would cause the HPCS Suppression Suction Valve to automatically open.		
Distracters: B.E22-F015 and E22-F004 would both be open C. E22-F015 and E22-F004 would both be open D. E22-F015 and E22-F004 would both be open		
K/A Match Applicant must have knowledge of the interrelationship between CST level and the HPCS system..		
Technical References: R-STM-0203		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0203-LO Obj.18 Given a set of plant conditions, explain how the HPCS System will respond to the status of the following systems: Condensate Storage Tank (CST)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	X
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)7	

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Level of Difficulty:	3	
SRO Only Justification: NONE		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
211000 (SF1 SLCS) Standby Liquid Control Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.02 SBLC control switch	Tier	2
	Group #	1
	K/A	211000 A4.02
	Rating	4.2
	Revision	0
Revision Statement:		

Question: 5

The key shown was turned to RUN position for 2 seconds and returned to NEUTRAL position.

The following indications were observed.



What is the status of SLC?

- A. Once the C41-F001B, SLC PUMP B SUCT VLV, opens, then the SQUIB Valve will fire and the pump will start to commence injecting SLC into the RPV.
- B. Once the C41-F001B, SLC PUMP B SUCT VLV, opens, then the SLC Pump B will start to commence injecting SLC into the RPV.
- C. SLC will not inject into the RPV because the SLC PUMP B should have started when the key was turned to RUN position.
- D. SLC will not inject into the RPV because the SQUIB Valve should have fired when the key was turned to the RUN position.

Answer: D

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Explanation: The Squib Continuity light should have extinguished immediately after the SBLC handswitch was taken to RUN indicating there's an open discharge flow path to the RPV. The SLC Pump B will start once the suction valve goes full open and it doesn't depend on the squib valve firing. Without a discharge flow path, SLC B will not be able to inject in the RPV.		
Distracters: A.The F001B will go open but it will not signal the squib valve to fire. The squib valve fires based on the SBLC handswitch being in RUN. B.SLC Pump B will start when the F001B opens fully, however, it will not have a discharge flow path C.SLC Pump B starts when the F001B is full open, it is not started based on SBLC switch position		
K/A Match Applicant must have ability to monitor and operate the SBLC system utilizing the handswitch.		
Technical References: R-STM-0201 SLC System		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0201-LO Obj.4 Describe how the following controls, indications, and/or interlocks affect the status of the SLC System		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)7	
Level of Difficulty:	3	
SRO Only Justification: N/A		

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PRA Applicability:

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Examination Outline Cross Reference	Level	RO
212000 (SF7 RPS) Reactor Protection Knowledge of REACTOR PROTECTION SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.12 Bypassing of selected SCRAM signals (manually and automatically)	Tier	2
	Group #	1
	K/A	212000 K4.12
	Rating	3.9
	Revision	2
Revision Statement:		
Rev 1 Changed the stem of the question completely by adding a picture of the MODE switch		
Rev 2 Went back to original question with slight modification of the stem.		

Question: 6

Which of the following scram signals is dependent solely on Mode Switch position for the scram signal to be bypassed?

- A. RPV Level 8
- B. SDV High Level
- C. RPV High Pressure
- D. High Drywell Pressure

Answer: A
Explanation: RPV Level 8 is ONLY active with MODE switch in the RUN position. From the picture, the MODE switch is in the Startup position. SDV High Level will be bypassed with MODE switch in Shutdown or Refuel, and its individual SDV Bypass test switches in TEST RPV High Pressure and Drywell Pressure SCRAM signals are never bypassed
Distracters: B Mode switch is in Startup C and D. No bypass for RPV High Pressure or High DW pressure
K/A Match Applicant must have knowledge of which RPS signals can be bypassed and how that is accomplished
Technical References:

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R-STM-0508 RPS System		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0508 Obj.8 Describe Reactor Protection System response and parameters to monitor from the Main Control Room during the following: Mode switch position changes		
Question Source:	Bank # GGNS AUDIT 2011	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)(7)	
Level of Difficulty:	2	
SRO Only Justification: N/A		
PRA Applicability: RPS, #4 Risk Significant System		

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Examination Outline Cross Reference	Level	RO
215003 (SF7 IRM) Intermediate Range Monitor Ability to predict and/or monitor changes in parameters associated with operating the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM controls including: (CFR: 41.5 / 45.5) A1.02 Reactor power indication response to rod position changes	Tier	2
	Group #	1
	K/A	215003 A1.02
	Rating	3.7
	Revision	1
Revision Statement: Rev 1 Replaced Upscale alarm with downscale alarm		

Question: 7

During a reactor startup, power is rising following the withdrawal of a control rod. Current conditions are:

- IRM A 28/40 on Range 3

If the UP pushbutton is depressed for IRM A it will indicate ___(1)___ on Range 4 with ___(2)___ present.

- | | (1) | (2) |
|----|---------|-----------------|
| A. | 28/125 | down light |
| B. | 2.8/125 | no alarms |
| C. | 28/125 | no alarms |
| D. | 2.8/125 | downscale alarm |

Answer: C

Explanation:

Range between Range 3 and 4 widens the scale of the same decade of power indication so the value does not change by a factor of 10. No alarms are present at this power level.

Distracters:

- A. Part 1 is correct. Down light occurs at <15/125
 B. Range 3 and 4 are in the same decade so power does not change by a factor of 10. Part 2 is correct.

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<p>C. Correct – Range between Range 3 and 4 widens the scale of the same decade of power indication so the value does <u>not</u> change by a factor of 10. No alarms are present at this power level.</p> <p>D. Range 3 and 4 are in the same decade so power does not change by a factor of 10. Downscale occurs at 5/125 but Part 1 is incorrect.</p>		
<p>K/A Match Applicant must have the ability to predict changes in power indication on IRMs while ranging up</p>		
<p>Technical References: R-STM-0503 Neutron Monitoring</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0503 Obj 9 Describe the function and operation of the Intermediate Range Monitoring (IRM) System.</p>		
Question Source:	Bank # Oct 2012 Audit	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)2	
Level of Difficulty:	3	
<p>SRO Only Justification: N/A</p>		
<p>PRA Applicability:</p>		

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Examination Outline Cross Reference	Level	RO
215004 (SF7 SRMS) Source Range Monitor Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 SRM channels/	Tier	2
	Group #	1
	K/A	215004 K2.01
	Rating	2.6
	Revision	0
Revision Statement:		

Question: 8

The power supply to SRM 'C' detector is ____.

- A. RPS A
- B. RPS B
- C. VBS-PNL01A1
- D. VBS-PNL01B1

Answer: A
Explanation: RPS A is the power supply to SRM A & C
Distracters: B. Incorrect - RPS B is the power supply to SRM B & D C. Incorrect - VBS-PNL01A1 is the power supply to neutron monitoring recorders D. Incorrect - VBS-PNL01B1 is the power supply to neutron monitoring recorders
K/A Match Applicant must have knowledge of SRM power supplies.
Technical References: R-STM-0503 Neutron Monitoring
Handouts to be provided to the Applicants during exam: NONE
Learning Objective: R-STM-0503Obj 7 Describe the interrelationship(s) between the SRM System and the following: Reactor Protection System

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Question Source:	Bank # Dec 2014 NRC	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41(b)2	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
215005 (SF7 PRMS) Average Power Range Monitor/Local Power Range Monitor 2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6)	Tier	2
	Group #	1
	K/A	215005 2.4.49
	Rating	4.6
	Revision	1
Revision Statement: Rev 1 Replaced Distractor “Selecting Control Rods at H13-P680” with “Downshifting Reactor Recirculation Pumps”		

Question: 9

Which of the following tasks can be performed without a procedure but requires permission from the OM/CRS?

- A. Bypassing an INOP APRM channel
- B. Downshifting Reactor Recirculation Pumps
- C. Terminating and Preventing HPCS injection
- D. Manually initiating RCIC during a station blackout

Answer: A
Explanation: EN-OP-115, Conduct of Operations, has a River Bend Plant Specific Addendum which lists routine tasks that may be performed without a procedure. All four are on that list, but bypassing Nuclear Instruments requires permission from the OM/CRS
Distracters: B,C, and D can all be done without a procedure or permission from the OM/CRS
K/A Match Applicant must be able to perform tasks without referencing a procedure
Technical References: EN-OP-115 Conduct Of OPS
Handouts to be provided to the Applicants during exam: NONE
Learning Objective: NONE

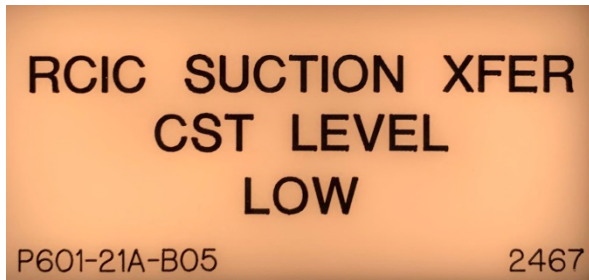
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Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)10	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

Examination Outline Cross Reference	Level	RO
217000 (SF2, SF4 RCIC) Reactor Core Isolation Cooling Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC): (CFR: 41.7 / 45.7) K6.03 Suppression pool water supply	Tier	2
	Group #	1
	K/A	217000 K6.03
	Rating	3.5
	Revision	1
Revision Statement: Rev 1 Changed the stem of the question to directly ask the impact to the CST suction valve and RCIC turbine. Added a time component after the alarm. Set the answer and distractors in a 2x2 format.		

Question: 10

RCIC is maintaining reactor water level when the following alarm comes in:



5 minutes later, this is the final status of E51-F031, RCIC PUMP SUP PL SUCTION VALVE.



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In this configuration, E51-F010, RCIC PUMP CST SUCTION VALVE, will __ (1) __ and the RCIC Turbine will __ (2) __ .

- | | |
|----------------|----------------|
| (1) | (2) |
| A. close | trip |
| B. close | remain running |
| C. remain open | trip |
| D. remain open | remain running |

Answer: D	
Explanation: The E51-F010 will not close until the E51-F031 is fully open. RCIC will remain operating with the E51-F010 fully open and E51-F031 mid position. The RCIC Turbine will not trip on low suction pressure in this configuration because the CST is vented the atmosphere which is ~30 in Hg abs and the RCIC trip is at 20 in Hg abs	
Distracters: A. Plausible if applicant believes the low CST level will cause the E51-F010 valve to close and RCIC Turbine will trip on loss of suction path. B. Plausible if applicant believes the low CST level will cause the E51-F010 valve to close but not result in a low suction pressure trip C. Plausible if applicant believes the RCIC Turbine will trip on low suction pressure	
K/A Match Applicant must have the knowledge of the suction swap interlocks for the RCIC system, and how it affects RCIC operation	
Technical References: ESK-11ICS01	
Handouts to be provided to the Applicants during exam: NONE	
Learning Objective: RLP-STM-0209 RCIC System List the controls, indications, automatic functions, and interlocks associated with the following RCIC System components (5): CST Suction Valve, E51-F010 Suppression Pool Suction Valve, E51-F031	
Question Source:	Bank #

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(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

Examination Outline Cross Reference	Level	RO
218000 (SF3 ADS) Automatic Depressurization Ability to monitor automatic operations of the AUTOMATIC DEPRESSURIZATION SYSTEM including: (CFR: 41.7 / 45.7) A3.09 Reactor vessel water level	Tier	2
	Group #	1
	K/A	218000 A3.09
	Rating	4.1
	Revision	0
Revision Statement:		

Question: 11

Following a LOCA:

- All Low Pressure ECCS pumps are running
- Drywell Pressure is 1.82 psid
- RPV level is -130 inches.

The Unit Operator depresses the ADS LVL 3/TIMER RESET PUSHBUTTON.

If all other conditions remain the same, how does the Automatic Depressurization System (ADS) respond?

- ADS SRVs remain open.
- All open ADS SRVs close.

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- C. ADS SRVs remain closed.
- D. ADS automatically initiates in 105 seconds.

Answer: C		
Explanation: All conditions for ADS to actuate exist except for Level 1 -143". Reactor water level has lowered to -130". The High Drywell Pressure signal only bypasses the 5 min timer, but a Level 1 signal is required to initiate ADS. Depressing the ADS LVL 3/TIMER RESET PUSHBUTTON would only reset the 105 second timer if was actuated by a Level 1		
Distracters: A. The SRVs would not have opened yet due to a lack of a Level 1 signal B. The SRVs would have never been opened in the first place based on the parameters given in the stem of the question. D. The ADS LVL 3/TIMER RESET PUSHBUTTON would reset the 105 second timer if it was initiated by a Level 1 signal. Level only reached -130".		
K/A Match Applicant must have the ability to monitor parameters and understand what is needed to initiate the ADS system.		
Technical References: R-STM-0202		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0202 Obj.2 List the signals, including setpoints and logic requirements that will automatically initiate ADS. (2)		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	

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Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		
ADS, #3 Risk Significant System		

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Examination Outline Cross Reference	Level	RO
223002 (SF5 PCIS) Primary Containment Isolation/Nuclear Steam Supply Shutoff Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.05 Nuclear boiler instrumentation failures	Tier	2
	Group #	1
	K/A	223002 A2.05
	Rating	3.3
	Revision	2
Revision Statement:		
Rev 1 Added logic diagram to the explanation. Added the word directly to the stem		
Rev 2 added high and low as failures direction for the transmitters		

Question: 12

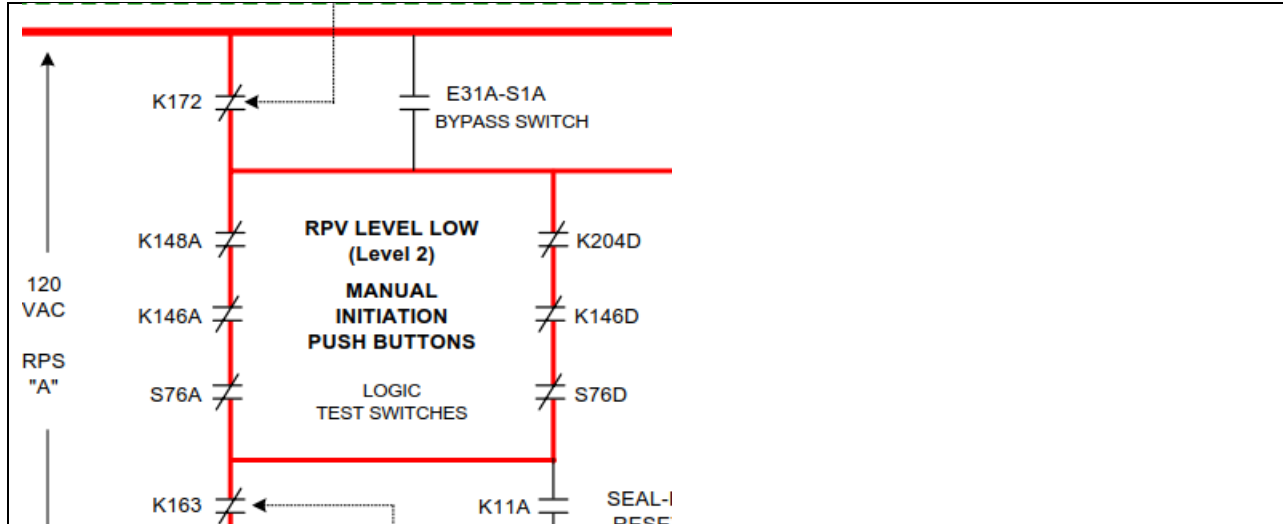
A failure of __ (1) __ transmitters would **directly** cause a Reactor Water Cleanup (RWCU) System isolation.

If RWCU isolates, it must be unisolated promptly (within approximately a shift) or it must be filled and vented with __ (2) __ IAW SOP-90, Reactor Water Cleanup (RWCU) System.

Note: CNS – Condensate Makeup, Storage, and Transfer System
MWS – Makeup Water System

- | | |
|------------------------------|-----|
| (1) | (2) |
| A. Drywell Pressure (high) | CNS |
| B. Drywell Pressure (high) | MWS |
| C. Reactor Water Level (low) | CNS |
| D. Reactor Water Level (low) | MWS |

Answer: C
Explanation: The RWCU system will isolate on a low Reactor water level signal of -43", but not due to a high drywell pressure of 1.68 psid. Refer to logic diagram below:



SOP-90 P&L 2.29 states “If RWCU isolates, it must be unisolated promptly (within approximately a shift) or it must be filled and vented with CNS. Failure to unisolated promptly can result in a leak detection trip and demin isolation. Timely restoration is also required to minimize the dose consequences arising from a fill and vent.”

Distracters:

- A. Is plausible because CNS would be used to fill the system, but the high drywell pressure would not have caused an isolation.
- B. MWS is plausible because it's used to add water to many closed loop systems in the plant, but CNS is used for the RWCU system.
- D. Low Reactor water level would cause an RWCU isolation but MWS would not be used to fill the system

K/A Match

The applicant must have the ability to predict RWCU system's response to boiler instrumentation failures and use applicable procedures to mitigate the consequences.

Technical References:

- SOP-0090 P&L 2.29
- R-STM-0601 RWCU system

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0601-LO Obj.10
 Given a set of plant conditions, predict the consequences a loss or malfunction of the following will have on the RWCU System:

Question Source:	Bank #	
(note changes and attach	Modified Bank #	

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parent)		
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
239002 (SF3 SRV) Safety Relief Valves Knowledge of the operational implications of the following concepts as they apply to RELIEF/SAFETY VALVES: (CFR: 41.5 / 45.3) K5.04 Tail pipe temperature monitoring	Tier	2
	Group #	1
	K/A	239002 K5.04
	Rating	3.3
	Revision	1
Revision Statement: Rev 1 Changed question source from New to Modified		

Question: 13

This Alarm is initiated by SRV tailpipe _____.



- A. flow
- B. acoustics
- C. pressure
- D. temperature

Answer: D

Explanation:

This alarm is directly tied to thermocouples in the SRV tailpipes and sent to B21-R614 Temperature Recorder. Flow and pressure are NOT parameters measured in the SRV tail pipe, but are plausible choices since they are measured in the Main Steam Lines. Acoustic monitors are used in the SRV tailpipe to alert the Operator that an SRV is full open, but acoustic monitors do NOT cause this alarm.

Distracters:

- A.** Steam flow is not a parameter measured in the SRV tailpipes, but it is measured in the Main steam lines.
- B.** Acoustics are measured in the SRV tailpipes but they are not tied to this alarm.
- C.** Steam pressure is not a parameter measured in the SRV tailpipes, but it is measured

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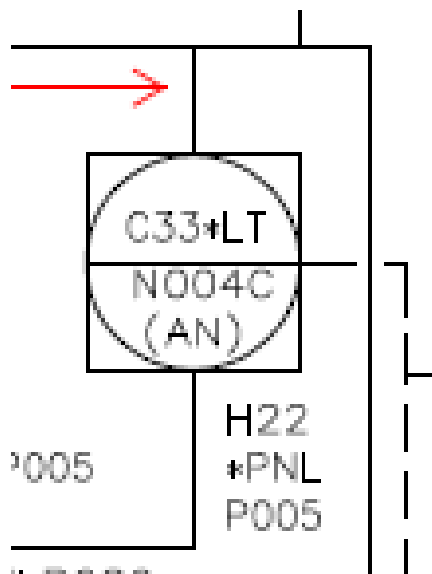
in the Main steam lines.		
K/A Match		
The applicant must have the knowledge of what indications are available when an SRV is leaking and what parameter is monitored when it is.		
Technical References:		
R-STM-0109 Main Steam		
ARP-601-19-B09 Alarm Response		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0109-LO Obj.23		
List the methods for verifying an SRV is open or leaking past its seat		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	X
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
259002 (SF2 RWLCS) Reactor Water Level Control Knowledge of the operational implications of the following concepts as they apply to REACTOR WATER LEVEL CONTROL SYSTEM: (CFR: 41.5 / 45.3) K5.03 Water Level Measurement	Tier	2
	Group #	1
	K/A	259002 K5.03
	Rating	3.1
	Revision	1
Revision Statement: Rev 1 Added the word ONLY to distractor A		

Question: 14

The Reference Leg to the instrument below has ruptured (RED ARROW):
"B" is selected for Reactor Level Control.
(All other instruments are operating properly)



What is the result of this failure?

- A. Level Signal Deviation light ONLY
- B. Level Signal Deviation light and Recirc Flow Control Runback
- C. Level Signal Deviation light and Trip of the Feedwater Pumps
- D. Level Signal Deviation light and Downshift of the Recirc Pumps

Answer: A

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Explanation:		
There are 3 narrow range level transmitters associated with feedwater level control(N004A,B,C). N004A or N004B can be selected as the channel to control water level, N004C only provides an independent signal of deviation or the 2 out 3 turbine/feedpump trip. A rupture of the reference leg of N004C(in the picture) would make indicated level for this transmitter to fail high. When the level difference between N004C and N004B exceeds 6 inches, the deviation light will come on. No automatic actions (other than the alarm) occur for failure of RPV Level Channel "C".		
Distracters:		
B,C,D. No automatic actions (other than the alarm) occur for failure of RPV Level Channel "C".		
K/A Match		
The applicant must have the knowledge of water level transmitters and failure modes that are associated with the feedwater level control system.		
Technical References:		
R-STM-0107 Feedwater Level Control		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0107-LO Feedwater Level Control		
Given a set of plant conditions, predict the effect that a loss or malfunction of the Feedwater System will have on the following:(15)		
a. Reactor Water Level		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		

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PRA Applicability:

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Examination Outline Cross Reference	Level	RO
261000 (SF9 SGTS) Standby Gas Treatment Knowledge of the effect that a loss or malfunction of the STANDBY GAS TREATMENT SYSTEM will have on following: (CFR: 41.7 /45.6) K3.05 Secondary containment radiation/contamination levels	Tier	2
	Group #	1
	K/A	261000 K3.05
	Rating	3.2
	Revision	1
Revision Statement: Rev 1 Swapped distractors C and D		

Question: 15

Based on Startup Instructions in SOP-0043, Standby Gas Treatment,

(1) How does simultaneous operation of both Standby Gas Treatment (GTS) trains have the potential to raise contamination levels in the Auxiliary Building and

(2) How can this be avoided?

- A. (1) By drawing air and potential contamination out of floor drains due to the excessive vacuum drawn by both trains.
(2) Notify Radiation Protection to install hardware cloth and filter media at drain hubs prior to simultaneous operation of both trains.
- B. (1) By drawing air and potential contamination out of floor drains due to the excessive vacuum drawn by both trains.
(2) Ensure the filter train recirculation damper is open to recirculate air flow back to the train suction.
- C. (1) The initial rush of air flow through the absorber beds force long live isotopes to be released from the charcoal.
(2) Notify Radiation Protection to install hardware cloth and filter media at ventilation exhaust points prior to simultaneous operation of both trains.
- D. (1) The initial rush of air flow through the absorber beds force long live isotopes to be released from the charcoal.
(2) Ensure the filter train bypass damper is open to recirculate air flow back to the train suction.

Answer: A

Explanation:

As stated in SOP-0043

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IF both Standby Gas trains will be operated simultaneously with the suction aligned from the Auxiliary Building for testing, THEN prior to starting GTS-FN1A and B, SGT EXH FAN A and B, DIRECT Radiation Protection to install the hardware cloth and filter media per ER-RB-2005-0342 in the Auxiliary Bldg floor drain hubs to prevent the spread of contamination.

Distracters:

B. Part 1 is correct, but recirc the train discharge back to the suction will not help since the contamination occurs due to the negative pressure drawn on the building pulling contaminants from the drains.

C, Neither Part 1 nor Part 2 is correct.

D. Part 2 is correct for mitigating the area radiation, but the reason for it is not correct.

K/A Match

The applicant must have knowledge of the operation of standby gas treatment system and how it can affect secondary radiation levels. The applicant must also know how to avoid the increased radiation levels.

Technical References:

SOP-0043 Rev 21, Section 5.1

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0257 Obj. 8

Given a Precaution & Limitation for the Standby Gas Treatment System, explain its basis. (8)

Question Source:	Bank # Oct 2012 Audit	X
(note changes and attach parent)	Modified Bank #	
	New	

Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	

10CFR Part 55 Content:	55.41b.10	
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Level of Difficulty:	3	
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SRO Only Justification:

N/A

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PRA Applicability:

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Examination Outline Cross Reference	Level	RO
262001 (SF6 AC) AC Electrical Distribution Ability to predict and/or monitor changes in parameters associated with operating the A.C. ELECTRICAL DISTRIBUTION controls including: (CFR: 41.5 / 45.5) A1.04 Load currents	Tier	2
	Group #	1
	K/A	262001 A1.04
	Rating	2.7
	Revision	0
Revision Statement:		

Question: 16

The plant has experienced a LOP/LOCA event from full power operations.

HPCS is being used to maintain reactor water due to RCIC being tagged out.

All automatic actuations have occurred.

Current Reactor parameters:

- Reactor pressure 1000 psig
- Reactor water level 10 inches

Which of the following cause an increase in load currents on E22-S004, DIV 3 4160KV Bus?

- A. CST water level lowering
- B. Lowering Reactor pressure
- C. Manually raising bus voltage
- D. Closing E22-MOVF004, HPCS Injection valve

Answer: B & D

Explanation:

The question is based on generic fundamental knowledge of centrifugal pump laws. As pressure drops, the pump flow rate would increase. The increase in flowrate would cause the HPCS pump to draw more current from the Div 3 bus.

Changed answer key post exam to also accept D as a correct answer. Since operation of the HPCS injection valve technically adds current to the 4160 volt bus (about 1.9 amps)

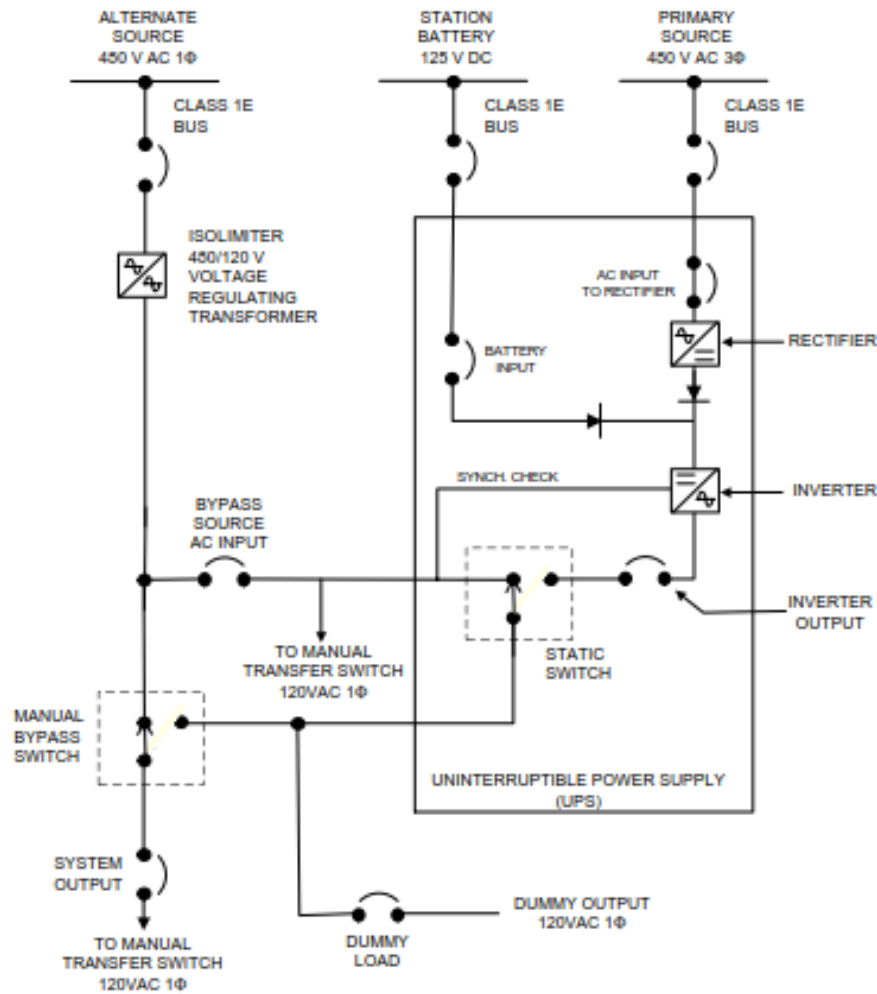
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Distracters:		
A. Lowering CST level would decrease the net positive available but not the flowrate, thus the current draw.		
C.Raising bus voltage would cause load currents to drop. $P=IE$		
D.Closing the injection valve would decrease the flowrate to minimum flow, thus decreasing the load current.		
K/A Match		
The applicant must have the ability to predict changes in amps based on flowrate of a centrifugal pump		
Technical References:		
RLP-HLO-0153 Pumps		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-HLO-0153 Obj.11		
Explain the three centrifugal pump laws		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.5	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

Examination Outline Cross Reference	Level	RO
262002 (SF6 UPS) Uninterruptable Power Supply (AC/DC) Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) A4.01 Transfer from alternative source to preferred source	Tier	2
	Group #	1
	K/A	262002 A4.01
	Rating	2.8
	Revision	2
Revision Statement:		
Rev 1 Added distractor A to distractor C to balance the distractors		
Rev 2 Added ONLY to distractors A and B. Added that actions taken must be completed in a specific order to the distractor analysis.		

Question: 17

All breakers below are closed except DUMMY LOAD



At a **MINIMUM**, What action(s) will transfer this Inverter from Maintenance Bypass to INVERTER SUPPLYING LOAD?

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- A. Depressing INVERTER TO LOAD pushbutton ONLY
- B. Placing the MANUAL BYPASS SWITCH in NORMAL OPERATION ONLY
- C. Depressing INVERTER TO LOAD pushbutton and then Placing the MANUAL BYPASS SWITCH in NORMAL OPERATION
- D. Placing the MANUAL BYPASS SWITCH in NORMAL OPERATION and then Depressing INVERTER TO LOAD pushbutton

Answer: D		
Explanation: Based on the drawing provided, the Inverter can only supply the load after Placing the MANUAL BYPASS SWITCH in NORMAL OPERATION and then Depressing INVERTER TO LOAD pushbutton. In that specific order.		
Distracters: A. Opening this breaker would cause a complete loss of system output to the load B This action is required, but by itself would not complete the transfer C. Correct actions but wrong order.		
K/A Match This applicant must have the ability to transfer an Inverter from bypass to normal supply power		
Technical References: SOP-0048 120 VAC System		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0300-LO Obj.6 Describe the operation of a 120 VAC uninterruptible power supply.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X

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10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
263000 (SF6 DC) DC Electrical Distribution Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on following: (CFR: 41.7 / 45.4) K3.02 Components using D.C. control power (i.e. breakers)	Tier	2
	Group #	1
	K/A	263000 K3.02
	Rating	3.5
	Revision	0
Revision Statement:		

Question: 18

What effect will a Loss of Division II 125VDC ENB Bus have on plant systems?

- A. Inability to initiate LPCS
- B. RCIC Inboard Isolation valves will lose power
- C. RHR C will lose all automatic trip functions
- D. Loss of power to the RCIC gland seal compressor

Answer: C
Explanation: A loss of Div 2 DC power would affect all Div 2 components that utilize DC power (ie breaker control power). RHR C is the only Div 2 component listed that would be affected by this loss. RHR C losing control power would prevent any remote or automatic functions.
Distracters: A. LPCS is a Div 1 component B. RCIC inboard isolation valves are Div 2, but they are powered from AC sources D. RCIC gland seal compressor is powered from a non-safety related DC source BYSSWG01B
K/A Match The applicant must have the knowledge of how a loss of DC control power will affect a component
Technical References: AOP-0014 Loss of DC

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Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-OPS-AOP0014 Obj.3		
Predict the operational implications of the following as they apply to a Loss of 125 VDC		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		
Safety Related DC power,#7 Risk Significant Systems		

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Examination Outline Cross Reference	Level	RO
264000 (SF6 EGE) Emergency Generators (Diesel/Jet) EDG Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Parallel operation of emergency generator	Tier	2
	Group #	1
	K/A	264000 A2.01
	Rating	3.5
	Revision	2
Revision Statement:		
Rev 1 Rewrote the question to meet the K/A better		
Rev 2 Removed the synchroscope position as part of the answer and replaced it with direction as suggested.		

Question: 19

The Unit Operator is preparing to parallel the DIV 1 Standby Diesel Generator with Offsite Power IAW SOP-53, STANDBY DIESEL GENERATOR AND AUXILIARIES.

After placing the SYNCHRONIZING Control Switch to GEN, the synchroscope is rotating at a rate of one revolution every 4 seconds.



(Initially)



(1 second later)

Based on these indications, The Unit Operator would need to __ (1) __ frequency and then close the Diesel Output Breaker 5 minutes to 2 minutes before the 12 o'clock position with the synchroscope moving SLOW in the __ (2) __ direction.

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- | | |
|----------|------|
| (1) | (2) |
| A. raise | FAST |
| B. raise | SLOW |
| C. lower | FAST |
| D. lower | SLOW |

Answer: A		
Explanation: From the indications above, frequency is too low too parallel with offsite power. Voltage is in range Frequency should be above 60 Hz to prevent a reverse power condition. From SOP-0053” Adjust diesel speed, using the STBY DIESEL GENERATOR A(B) GOVERNOR CONTROL, to bring the frequency within the range of grid frequency. Adjust speed so the SY-1-SYDA(B)01, STBY BUS A(B) SYNCHROSCOPE indicator is rotating slowly in the FAST direction (clockwise) at a rate of one revolution in greater than or equal to 4 seconds and less than or equal to 6 seconds”.		
Distracters: B .raising frequency is correct, but the synchroscope needs to be moving SLOW in the FAST direction before closing the output breaker to acquire load. C. Frequency is already too low based on the indications provided. D. Frequency is already too low based on the indications provided.		
K/A Match The applicant must have the ability to monitor diesel generator indications before parallel operation for abnormalities and make the appropriate adjustments per procedure.		
Technical References: SOP-0053 Standby Diesel Generator		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0305S Standby Diesel Generator Given a list of Standby Diesel Generators operating parameters, classify the parameter as normal or abnormal.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	

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	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability: Recover a Diesel Generator within 1 hour, #4 Operator Actions		

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Examination Outline Cross Reference	Level	RO
300000 (SF8 IA) Instrument Air Knowledge of the connections and / or cause effect relationships between INSTRUMENT AIR SYSTEM and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.03 Containment air	Tier	2
	Group #	1
	K/A	300000 K1.03
	Rating	2.8
	Revision	0
Revision Statement:		

Question: 20

The plant is operating at 100 % power.

The Unit Operator has isolated an Instrument Air leak by closing IAS-MOV106, Containment Instrument Air Isolation Valve.

The Scram Discharge Volume Vent and Drain Valves will fail __ (1) __, and the CRD Flow Control Valve will fail __ (2) __.

- | | |
|-----------|--------|
| (1) | (2) |
| A. Open | Open |
| B. Open | Closed |
| C. Closed | Open |
| D. Closed | Closed |

Answer: D

Explanation:

The closure of IAS-MOV106, Containment Instrument Air Isolation Valve, will isolate air to Containment. The Scram Discharge Volume Vent and Drain Valves will fail closed due a loss of air to prevent radioactive release. The CRD Flow Control Valve will fail close to divert all water to the charging water header.

Distracters:

A,B,C. contain the wrong combination of failure modes

K/A Match

The applicant must have knowledge of which components are affected by a loss of Containment air, and how they fail.

Technical References:

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R-STM-0052 Control Rod Drive System		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0052 Obj.5 Describe the CRD system interfaces between the following systems and Control Rod Drive: Instrument air		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability: IAS, #2 Risk Significant Systems		

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Examination Outline Cross Reference	Level	RO
400000 (SF8 CCS) Component Cooling Water Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: (CFR: 41.7 / 45.6) K3.01 Loads cooled by CCWS	Tier	2
	Group #	1
	K/A	400000 K3.01
	Rating	2.9
	Revision	1
Revision Statement: Changed distractor A to RWCU Pumps, Drywell Equipment Drain Sump Cooler, CRD Pumps		

Question: 21

A leak in the Reactor Plant Component Cooling Water System (CCP) has resulted in system pressure dropping to 52 psig

Which of the following components will continue to receive cooling flow from CCP?

- A. RWCU Pumps, Drywell Equipment Drain Sump Cooler, CRD Pumps
- B. RWCU Non Regen Heat Exchangers, SFC Heat Exchangers, Recirculation Pumps
- C. RWCU Pumps, Recirculation Pumps, RWCU Non Regen Heat Exchangers
- D. CRD Pumps, Drywell Equipment Drain Sump Cooler, SFC Heat Exchangers

Answer: C
Explanation: None of the listed loads are in the safety loops which isolate at 56 psig.
Distracters: A. NOT Correct. This answer is plausible since CRD pumps are considered non-safety related loads; however CRD pump cooling taps off inside the 'B' safety loop and will be isolated from cooling. B. NOT Correct. This answer is plausible since the RWCU Non-Regen HXs and Reactor Recirc pumps receive cooling from the non-safety related portion of the system; however SFC heat exchangers cooling taps off inside the safety loops and will be isolated from cooling. C. Correct - None of the listed loads are in the safety loops which isolate at 56 psig. D. NOT Correct. This answer is plausible since the Drywell Equipment Drain Sump Cooler is non-safety related; however the RHR Pump Seal Coolers and SFC heat exchanger cooling taps off inside the safety loops and will be isolated from cooling.
K/A Match

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The applicant must have knowledge of which components are cooled by the safety loops of CCP		
Technical References: R-STM-0115 CCP System AOP-0011, Loss of CCP		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0115 Obj. 11 Given a set of plant conditions, predict the effect that a loss or malfunction of the Reactor Plant Component Cooling Water System will have on the following: Loads cooled by RPCCW		
Question Source:	Bank # 2015 NRC #15	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41b.4	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
203000 (SF2, SF4 RHR/LPCI) RHR/LPCI: Injection Mode Ability to (a) predict the impacts of the following on the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.16 Loss of coolant accident	Tier	2
	Group #	1
	K/A	203000 A2.16
	Rating	4.4
	Revision	2
Revision Statement: Rev 1: Changed stem to require RHR injection valve not LPCS injection valve operation. Rev 2: Changed answer pressures to ensure every answer is plausible.		

Question: 22

A LOCA has occurred.

CRS directs an Emergency Depressurization on Reactor water level.

The following alarm is received on 1H13-P601:
LPCI B/C INJ VLV RPV PRESS LOW, H13-P601/17A/F02

(1) Per the ARP, when should the E12-F042B, RHR PUMP B INJECT ISOL VALVE be verified auto open?

(2) Approximately when should injection flow commence?

- A. 324 psig 123 psig
- B. 324psig 324 psig
- C. 487 psig 123 psig
- D. 487 psig 324psig

Answer: D
Explanation: Per LPCS/LPCI A INJ VALVE RPV PRESS LOW, H13-P601/21A/E06 INITIATING DEVICES SETPOINTS

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<p>1. B21-PISN697A 487 psig AUTOMATIC ACTIONS E21-F005, LPCS INJECT ISOL VALVE opens if a Div I initiation signal is present. E12-F042A, RHR A INJECTION VALVE opens if a Div I initiation signal is present.</p> <p>LPCI B/C INJ VLV RPV PRESS LOW, H13-P601/17A/F02 INITIATING DEVICES B21-N697B Setpoint 487 psig Automatic Actions E12-F042B, RHR PUMP B LPCI INJECT ISOL VALVE opens. E12-F042C, RHR PUMP C LPCI INJECT ISOL VALVE opens.</p> <p>Per R-STM-0204, INJECT ISOL VALVE * AUTO OPEN upon LPCI initiation signal when reactor pressure is less than 487 psig</p> <p>Per R-STM-0204, Injection into the reactor vessel begins after the injection valves open when reactor pressure decreases to the pump's shutoff head. Design specifications require injection flow to commence at a vessel pressure of 324 psig above drywell pressure.</p>		
<p>Distracters: Per TSG-0001, Technical Support Guidelines, the SPC/ADHR shutoff head is 123 psig.</p> <p>The applicant could also confuse LPCI operation with HPCS operation which injects when the valve opens.</p> <p>All answers are plausible if applicant confuses Auto open signal, injection flow, or SPC/ADHR shutoff head.</p>		
<p>K/A Match The applicant must have the ability to predict how the LPCI system will respond to a LOCA signal and corresponding pressures for the injection valve opening and shutoff head.</p>		
<p>Technical References: R-STM-0204 RHR System</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0204 Obj.10 Given key plant/system status and key parameters, predict/determine Residual Heat Removal System response.</p>		
<p>Question Source:</p>	<p>Bank # RBS VISION EB</p>	<p>X</p>

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(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
205000 (SF4 SCS) Shutdown Cooling Ability to monitor automatic operations of the SHUTDOWN COOLING SYSTEM (RHR SHUTDOWN COOLING MODE) including: (CFR: 41.7 / 45.7) A3.02 Pump trips	Tier	2
	Group #	1
	K/A	205000 A3.02
	Rating	3.2
	Revision	0
Revision Statement:		

Question: 23

While operating RHR "A" in the Shutdown Cooling Mode, a spurious isolation signal actuates the INBOARD (Div. 2) Containment and Reactor Vessel Isolation Control System (CRVICS) isolation logic for RHR Shutdown Cooling.

The Shutdown Protection Plan per SOP-0031 has NOT been implemented.

What is the final state of the following RHR System components after all automatic actions have occurred?

SDC OUTBD ISOLATION VLV RHR E12-F008	RHR PUMP A
A. Open	Tripped
B. Open	Running
C. Closed	Tripped
D. Closed	Running

Answer: A

Explanation:

The RHR System has two isolation valves E12-F008 (outboard) and E12-F009(inboard) that prevent a LOCA while operating in the Shutdown cooling mode. Both valves will close on the same signals but have independent transmitters. The Shutdown Protection Plan will remove power to one of the valves to allow testing during a refueling outage.

The question states that an inboard isolation signal was received which would only affect the E12-F009 valve causing it to auto close. E12-F008 will remain open due to that fact it's an outboard valve. Once E12-F009 is NOT FULL OPEN, RHR A will automatically trip due a loss of suction path.

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Distracters:		
B. E12-F008 would remain open, however, the pump would trip due to the closure of the E12-F009		
C. E12-F008 would not receive a close signal		
D. E12-F008 would not receive a close signal		
K/A Match		
Applicant must have the knowledge of what would trip a RHR pump while operating in the shutdown cooling mode.		
Technical References:		
AOP-0003		
R-STM-0204		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0204-LO Obj.6		
List the automatic functions and interlocks of the following Residual Heat Removal System components		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

Examination Outline Cross Reference	Level	RO
211000 (SF1 SLCS) Standby Liquid Control 2.2.25 Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)	Tier	2
	Group #	1
	K/A	211000 2.2.25
	Rating	3.2
	Revision	@
Revision Statement:		
Rev 1 Swapped distractors A and B. Replaced distractor D with “The Pump handswitches are disabled”		
Rev 2 Swapped distractor analysis for A and B		

Question: 24

The following alarm is in on H13-P601



With these indications, BOTH subsystems of SLC are inoperable (T.S 3.1.7)

What is the reason for this?

- A. The Pumps will not start
- B. The Squib valves will not fire
- C. The Suction MOVs will not open
- D. The Pump handswitches are disabled

Answer: C
Explanation: The SLC Test Tank suction valve C41-F031 has to be FULL closed in order for the storage tank suction MOVs to open to allow sodium pentaborate to be injected in the RPV. The pumps could start if F031 is full open and the squib valves would fire as well. This is how testing for the system is accomplished.
Distractors: A. The Pumps will start if the F031 valve is full open

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<p>B. The squib will fire when the SLC handswitch is placed in RUN D.The SLC Pump handswitches are still enabled. They can be disabled from enable/disable switches in the plant</p>		
<p>K/A Match The applicant must have the knowledge of SLC technical specifications</p>		
<p>Technical References: R-STM-0201 SLC System Technical Specifications 3.1.7</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0201-LO Identify the Technical Specifications and/or Technical Requirements Manual requirements of the SLC System.</p>		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
<p>SRO Only Justification: N/A</p>		
<p>PRA Applicability:</p>		

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Examination Outline Cross Reference	Level	RO
215004 (SF7 SRMS) Source Range Monitor Knowledge of SOURCE RANGE MONITOR (SRM) SYSTEM design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.01 Rod withdrawal blocks	Tier	2
	Group #	1
	K/A	215004 K4.01
	Rating	3.7
	Revision	0
Revision Statement:		

Question: 25

What set of conditions for SRM "A" would cause a Control Rod Withdrawal Block?

- A. Indicating 2.5 E5 with all IRMs on Range 9
- B. Period meter indicating ≤ 50 seconds with IRM "A" on range 3 or below
- C. SRM channel mode switch is out of OPERATE position during any MODE
- D. Indicating 75 cps with detector not full in during IRM/SRM overlap verification.

Answer: D
Explanation: SRM Detector Wrong Position generates a control rod withdrawal block when the SRM system counts are ≤ 100 cps AND the detector is NOT fully inserted. The control rod withdrawal block is bypassed if any of the following conditions exist: Associated IRMs on Range 3 or above(overlap occurs on Range 2) Reactor Mode Switch in RUN Associated SRM channel bypassed
Distracters: B. SRMs have a period meter, but it doesn't provide a rod block signal C.. Taking a SRM mode switch out of OPERATE will generate a rod block, but only when SRM rod block signals are active and not bypassed. A. High enough CPS to generate a rod block, but all SRM rod blocks are bypassed when associated IRMS are \geq range 8
K/A Match The applicant must the knowledge of SRM rod block setpoints and when they are bypassed
Technical References: R-STM-0503

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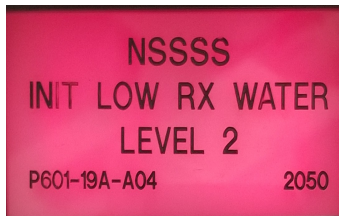
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0503 Obj. 7 Describe the interrelationship(s) between the SRM System and the following:RCIS		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
263000 (SF6 DC) DC Electrical Distribution Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.02 Breaker interlocks, permissives, bypasses and cross ties	Tier	2
	Group #	1
	K/A	263000 K4.02
	Rating	3.1
	Revision	1
Revision Statement: Updated distractor analysis for distractor D		

Question: 26

How does the following alarm affect the DC Electrical Distribution system?



- A. EJS-SWG breakers to the non-safety related battery chargers trip
- B. All battery charger breakers trip and DC loads are supplied by batteries
- C. No battery charger breakers trip, operators must open breakers based on bus loading
- D. Breakers to the safety related battery chargers trip and then sequence back on with the Diesel Generator

Answer: A
Explanation: Where there is an electrical interface between safety-related switchgear and non-safety related equipment, such as chargers and switchgear, automatic breaker tripping by a LOCA (Level 2 (-43”) or 1.68 psid DW) signal at the safety-related switchgear is provided to remove the non-safety related load (or backup charger) from the safety-related bus.
Distracters: B. non-safety to non-safety is not affected by a LOCA signal. They continue to operate

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like normal		
C. non-safety related chargers powered from safety related busses will trip automatically on a LOCA		
D. Breakers to safety related chargers will not trip due a LOCA signal .		
K/A Match		
The applicant must have knowledge of DC battery charger interlocks and permissives.		
Technical References:		
R-STM-0305		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLTM-0305 Obj.9		
Describe the automatic actions that occur in the DC Electrical Distribution System upon receipt of a LOCA signal.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
201003 (SF1 CRDM) Control Rod and Drive Mechanism 2.2.39 Knowledge of less than or equal to one hour Technical Specification action statements for systems. (CFR: 41.7 / 41.10 / 43.2 / 45.13)	Tier	2
	Group #	2
	K/A	201003 2.2.39
	Rating	3.9
	Revision	1
Revision Statement: Corrected the Tier/Group number, Added MODE 2 to the stem of the question for clarification.		

Question: 27

MODE 2 with CRD Pump A out of service for seal repairs, the following sequence of events occurred:

- 1600 – Reactor Pressure is 720 psig AND stable
- 1605 - CRD Pump B tripped on overcurrent.
- 1612 - Annunciator ACCUMULATOR TROUBLE for CRD 20-13 at notch 48.
- 1615 - Annunciator ACCUMULATOR TROUBLE for CRD 38-17 at notch 12.
- 1617 - Tags are being cleared to make CRD Pump A available.

At 1620, how much time remains to return CRD Pump A to service before the Reactor Mode Switch must be placed in SHUTDOWN?

- A. 5 minutes
- B. 12 minutes
- C. 15 minutes
- D. 17 minutes

Answer: C

Explanation:

With two or more control rod scram accumulators inoperable and reactor steam dome pressure ≥ 600 psig, adequate pressure must be supplied to the charging water header. With inadequate charging water pressure, all of the accumulators could become inoperable, resulting in a potentially severe degradation of the scram performance. Therefore, within 20 minutes from discovery of charging water header pressure < 1540 psig concurrent with HCU accumulator trouble alarms, adequate charging water header pressure must be restored

Per LCO 3.1.5, the 20 minute completion time commenced at 1615 when the notch 12

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annunciator actuated and the second set of control rod scram accumulators became INOPERABLE. The Reactor Mode Switch must be place in SHUTDOWN at 1635, which is in 15 minutes.

Distractors:

A. Distractor 1 (5 minutes) is INCORRECT, but plausible if the applicant applies the 20 minute completion time to 1605 when CRD Pump B tripped on overcurrent; wrong since LCO 3.1.5 did NOT become applicable until 1615.

B. Distractor 2 (12 minutes) is INCORRECT, but plausible if the applicant applies the 20 minute completion time to 1612 when notch 48 annunciator actuated ; wrong since LCO 3.1.5 did NOT become applicable until 1615.

D. Distractor 3 (17 minutes) is INCORRECT but plausible if the applicant applies the 20 minute completion time to 1617 when clearance of tags from CRD Pump A commenced; wrong since LCO 3.1.5 was applicable at 1615.

K/A Match

The applicant must have knowledge of the 1 hour or less tech spec actions for this system.

Technical References:

T.S. 3.1.5

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0052 Obj.12

Identify the Technical Specifications /Technical Requirements (TRM) Manual requirements applicable to the Control Rod Drive System

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	X
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.6	
Level of Difficulty:	3	
SRO Only Justification:		

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N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
216000 (SF7 NBI) Nuclear Boiler Instrumentation Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following: (CFR: 41.7) K4.07 Recirculation pump protection	Tier	2
	Group #	2
	K/A	216000 K4.07
	Rating	2.9
	Revision	2
Revision Statement: Rev1 Removed the two cavitation interlock annunciators. The applicant must have knowledge of what the thermal shock interlocks prevent. Rev2 Changed distractor C by replacing AND with OR.		

Question: 28

The Recirculation Pump Thermal Shock Interlocks are installed to protect the pump from large thermal stresses by....

- A. Tripping off an operating pump
- B. Preventing a fast speed pump start ONLY
- C. Preventing a fast speed OR slow speed pump start
- D. Downshifting an operating pump from fast to slow speed

Answer: C
<p>Explanation: Vessel Thermal Shock Interlocks are installed in the Recirc pump start circuitry to prevent rapid changes in the vessel water temperatures or loop temperatures. Loop to loop suction $\Delta > 50^\circ\text{F}$. This interlock protects the pump from thermal stress and possible damage to the bearings and seals. If any one of these interlocks actuate, recirc pump start (fast or slow) is prohibited and the RECIRC PUMP "A" "B" TEMP INTERLOCK ACTUATED annunciator (H13-PNLP680) alarms. This does not down shift or trip the pump if running.</p>
<p>Distracters: A. Thermal shock interlocks do not trip a running pump B. Thermal shock interlocks prevent ANY type of Recirc pump start D. Thermal shock interlocks do not downshift a running Recirc pump</p>
K/A Match

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The applicant must have the knowledge of the Interlocks (and setpoints) that provide protection to the Recirc pumps.		
Technical References: R-STM-0053 ARP-680-04		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0053-LO Describe the following automatic features and interlocks for the Reactor Recirculation System components, including setpoints, system response and indications		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
219000 (SF5 RHR SPC) RHR/LPCI: Torus/Suppression Pool Cooling Mode Ability to (a) predict the impacts of the following on the RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.01 Inadequate net positive suction head	Tier	2
	Group #	2
	K/A	219000 A2.01
	Rating	3.0
	Revision	3
Revision Statement: Rev 1 Completely rewrote the entire question to meet the K/A better. Rev 2 Removed "leading to pump cavitation" from the question stem. Rev 3 Removed answer choices "suction" and "discharge" head. Replaced with vortexing and cavitation.		

Question: 29

RHR B is operating in Suppression Pool Cooling Mode.

Suppression Pool water level begins lowering due to a pipe rupture. Lowering Suppression Pool water level would **INITIALLY** cause __ (1) __ of the RHR B Pump.

Once the leak is isolated, The CRS directs the Unit Operator to restore Suppression Pool level IAW Encl 30, Suppression Pool Makeup.

__ (2) __ could restore Suppression Pool level the fastest.

- | | |
|---------------|------|
| (1) | (2) |
| A. vortexing | RCIC |
| B. vortexing | HPCS |
| C. cavitation | RCIC |
| D. cavitation | HPCS |

Answer: B

Explanation:

RHR B takes suction off the Suppression Pool during the Suppression Cooling mode. The vortex limits are defined to be the lowest **suppression pool water level** above which air entrainment is not expected to occur in pumps taking suction on the pool.

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These levels are functions of ECCS and RCIC flow. Exceeding the limits can lead to air entrainment at the pump suction strainers.
 The NPSH (Net Positive Suction Head) limits are defined to be the highest suppression pool temperature which provides adequate net positive suction head for pumps taking suction on the pool. The NPSH Limits are functions of pump flow and containment overpressure (airspace pressure plus the hydrostatic head of water over the pump suction). It is utilized to preclude pump damage from **cavitation**.
 Vortexing would be the initial concern for thr RHR pump as water level began to lower. HPCS has a makeup capacity of 5000 gpm, while RCIC only has a makeup capacity of 600 gpm.

Distracters:

- A** Vortexing is the correct answer, but HPCS has the higher flow capacity
- C.** cavitation is a concern for a lowering water level, however, vortexing would be the initial concern.
- D.** cavitation is a concern for a lowering water level, however, vortexing would be the initial concern

K/A Match

The applicant must have the ability to determine how a lowering Suppression Pool level could lead to inadequate net positive suction head for an operating RHR Pump, and what system has the ability to restore Suppression Pool level the fastest.

Technical References:

EOP-5. Encl 30

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		

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N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
234000 (SF8 FH) Fuel Handling Equipment Knowledge of the effect that a loss or malfunction of the FUEL HANDLING EQUIPMENT will have on following: K3.03 Fuel handling operations	Tier	2
	Group #	2
	K/A	234000 K3.03
	Rating	3.1
	Revision	1
Revision Statement: Revised the stem to include the words "entering the". Also, changed the distractors to make the question more plausible.		

Question: 30

While in the process of fuel movement, the Fuel Handling Platform motion has stopped automatically.

This would be a result of entering the_____.

- A. cask pool when the IFTS panels are de-energized
- B. transfer pool when the IFTS panels are de-energized
- C. cask pool when the IFTS upender in the vertical position
- D. transfer pool when the IFTS upender in the vertical position

Answer: B
Explanation: From R-STM-0055.The platform is prevented from entering the lower transfer pool if the IFTS upender is NOT in the vertical position or if the IFTS system is not energized. If theplatform attempts to enter the transfer pool in these conditions, the platform will stop and the controls will lock up.
Distractors: A, C, & D. None of these situations will cause an automatic stop of the fuel handling platform
K/A Match The applicant must have knowledge of what would cause a loss of fuel handling equipment.
Technical References: R-STM-0055

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Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0055-LO Obj. 4 Describe how the following controls, indications, and/or interlocks for the following: Fuel Handling Platform		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
239001 (SF3, SF4 MRSS) Main and Reheat Steam Knowledge of electrical power supplies to the following: (CFR: 41.7) K2.01 Main steam isolation valve solenoids	Tier	2
	Group #	2
	K/A	239001 K2.01
	Rating	3.2
	Revision	1
Revision Statement: Rewrote the question to meet the K/A statement better		

Question: 31

Placing the handswitch for B21-F028A, Outboard MSIV A, in the CLOSE position causes the pilot solenoids to become __ (1) __.

The pilot solenoids for B21-F028A, Outboard MSIV A, are powered from __ (2) __.

- | | |
|-----------------|-------------|
| (1) | (2) |
| A. energized | RPS A ONLY |
| B. energized | RPS A and B |
| C. de-energized | RPS A ONLY |
| D. de-energized | RPS A and B |

Answer: D

Explanation:

Two normally energized pilot solenoids (one powered from RPS "A" and the other from RPS "B") are used to initiate MSIV operation. Both the "A" and "B" solenoids must be de-energized to close the MSIVs.

The test solenoid for B21-F028A is normally de-energized as is powered from RPS A

Distracters:

A and B. pilots solenoids must be de-energized to close the valve

C. the pilot solenoids receive power from RPS A and B

K/A Match

The applicant must have the knowledge of the MSIV solenoid power supplies

Technical References:

R-STM-0109

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R-STM-0109		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0109-LO Obj.7 Describe the interrelations between RPS and the following systems:		
Question Source: (note changes and attach parent)	Bank # Modified Bank # New	 X
Question Cognitive Level:	Memory / Fundamental Comprehensive / Analysis	 X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
245000 (SF4 MTGEN) Main Turbine Generator/Auxiliary Knowledge of the effect that a loss or malfunction of the following will have on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS: (CFR: 41.7 / 45.7) K6.08 Main steam	Tier	2
	Group #	2
	K/A	245000 K6.08
	Rating	3.0
	Revision	1
Revision Statement: Replaced Reactor Scram with an MSIV isolation in the question stem		

Question: 32

A Group 6 isolation signal has caused all MSIVs to close.

The following conditions exist:

- All Turbine Control Valves are shut.
- TMB-JI108, GENERATOR WATTS has just reached ZERO.
- The Main Generator Exciter Field Breaker is CLOSED.
- Both Main Generator output breakers are CLOSED.
- Main Condenser vacuum is 24 inches Hg and STABLE.

With the above conditions continuing to exist, the Main Turbine should automatically trip as a result of which one of the following?

- A. Generator Volts/Hz
- B. Generator Differential
- C. Generator Loss of Field
- D. Generator Reverse Power

Answer: D

Explanation:

Inserting a manual scram causes Main Steam flow to the Main Turbine to rapidly lower. Motoring(Reverse power condition) of the generator occurs when the steam flow to the turbine is reduced to less than no-load flow(Control valves shut) when the generator is still on the line(Output breakers closed). The reverse power relay with trip the Main Generator to prevent overheating

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Distracters:		
<p>A. Volts/Hz relay protects against a high voltage to frequency ratio which can cause excessive magnetic flux leading to overheating and possible localized melting of the generator core laminations. This ratio would decrease after a loss of steam flow.</p> <p>B. Generator current differential relay senses generator current on all three phases. If a current differential exists between phases, this relay energizes the 86G lockout. Based on the question stem, all three phases will remain equal.</p> <p>C. Generator loss of field relay, prevents the operation of the generator as an induction machine, if the field excitation is lost. Field Breaker is still closed in, so no loss of field has occurred.</p>		
K/A Match		
The applicant must have the knowledge of the effect a loss of Main Steam would have of the Main Turbine Generator.		
Technical References:		
R-STM-0310		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
<p>RLP-STM-0310-LO Obj.7</p> <p>Describe the three generator protective relays, stating their number and letter designation and parameters that actuate them.</p>		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		
Reactor Trip/Turbine Trip, Internal Events contributing to Baseline Core Damage Frequency		

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Examination Outline Cross Reference	Level	RO
272000 (SF7, SF9 RMS) Radiation Monitoring Ability to monitor automatic operations of the RADIATION MONITORING SYSTEM including: (CFR: 41.7 / 45.7) A3.03 Liquid radwaste isolation indications	Tier	2
	Group #	2
	K/A	272000 A3.03
	Rating	3.1
	Revision	1
Revision Statement: Rewrote the question to eliminate the subset issue.		

Question: 33

If RMS-RE__(1)__ reaches its ALARM setpoint, flow from the Recovery Samples Tanks to the __(2)__ will be **isolated**.

- | | |
|--------|---------------------------------|
| (1) | (2) |
| A. 107 | Condensate storage Tank |
| B. 107 | Circulating Water blowdown line |
| C. 108 | Condensate storage Tank |
| D. 108 | Circulating Water blowdown line |

Answer: B
Explanation: RMS-RE107 provides an isolation signal to LWS-AOV257, RST Discharge Valve to CWS Blowdown. This valve is the last valve in line to the CWS Blowdown Line. It provides the isolation for LWS Discharge in the event a higher than anticipated activity level is seen in the discharge line or a loss of monitor sample flow. When this isolation occurs, LWS-AOV258, RST Discharge Diverting Valve, opens to redirect the discharge to the WCT Header. Flow for the discharge is controlled using LWS-FIC197, Recovery Sample RMS-RE108 monitors Circulating Water Blowdown upstream of where LWS discharge ties in. It provides alarm only, NO automatic actions Recovery Sample Tank contents can be transferred to the WCTs for reprocessing, the CST, or to the CWS Blowdown Line.
Distracters: A. Correct radiation monitor, but incorrect isolation flow path. C and D. Incorrect radiation monitor. Re-108 does measure circulating water blowdown but LWS discharge
K/A Match The applicant must have the ability to monitor automatic actions/isolations of the liquid

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radwaste system.		
Technical References: R-STM-0511 R-STM-0603		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0603-LO Obj.9 Describe the interlocks for the following Liquid Radwaste Processing components: <ul style="list-style-type: none"> a. Radiation Monitor, RMS-RE107 b. Radwaste Effluent Discharge Valve, LWS-AOV257 c. Radwaste Discharge Diverting Valve, LWS-AOV258 		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
286000 (SF8 FPS) Fire Protection 2.1.28 Knowledge of the purpose and function of major system components and controls	Tier	2
	Group #	2
	K/A	286000 2.1.28
	Rating	4.1
	Revision	1
Revision Statement: Changed the order of distractors.		

Question: 34

Which of the following signals **directly** initiates/starts the Fire Protection pumps?

- A. Area high temperature
- B. Actuation of a smoke alarm
- C. Fire Water System low pressure
- D. A Remote Data Acquisition Control (RDAC) panel in alarm

Answer: C
Explanation: The fire pumps primary start signal is initiated by pressure switches located on the discharge side of the pumps. A low system pressure will start the fire pumps
Distractors: A. An Area high temperature could possibly initiate an alarm and actuate a wet sprinkler or deluge, but it's the low pressure signal that starts the fire pumps. B. Smoke alarm will only provide an alarm indication D. RDCA panels monitor parameters such as flow in suppression systems, key valve positions, and detector loop integrity, etc. The RDAC panels are also looped together and interface with a computer in the main.
K/A Match The applicant must have knowledge of the function of fire protection major components.
Technical References: R-STM-0250
Handouts to be provided to the Applicants during exam: NONE

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Learning Objective: RLP-STM-0250-LO State the purpose of the Fire Protection and Detection Systems.		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	2	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
288000 (SF9 PVS) Plant Ventilation Ability to (a) predict the impacts of the following on the PLANT VENTILATION SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.02 Low reactor water level	Tier	2
	Group #	2
	K/A	288000 A2.02
	Rating	3.4
	Revision	1
Revision Statement: Added an actual Reactor water to stem and replaced the (2) with (1).		

Question: 35

Reactor Water level of -50" will cause an automatic initiation of the Standby Gas Treatment system after fully opening its respective trains__ (1) __ damper.

After automatic start of the standby gas treatment system, the operator should stop one of the two redundant filter trains as soon as plant conditions permit. Stopping one train is accomplished by depressing the__ (2) __pushbutton, thus returning it to the STANDBY condition.

- | | |
|------------|-------|
| (1) | (2) |
| A. inlet | RESET |
| B. inlet | STOP |
| C. exhaust | RESET |
| D. exhaust | STOP |

Answer: B

Explanation:

Both trains of GTS will auto start if the following are present:

- Inlet damper GTS-AOD1A(B) fully open
- 480 VAC bus voltage available;
- 4160/480 VAC standby local sequencing permissive satisfied; and
- Inverse time and instantaneous overcurrent trip reset
- Pushbutton for SGTS exhaust fan in "AFTER STOP" condition and Lockout/Reset pushbutton in "RESET", and any of the following:
- LOCA signal (1 out of 2, twice) Level 2(-43"), 1.68 psid Drywell pressure
- Low annulus pressure control system flow (180 cfm)

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<p>- RMS RE11A(B) Reactor building annulus ventilation gaseous radiation hi-hi (3.89 x 10⁻⁵ Tci/cc) After automatic start of the standby gas treatment system, the operator should stop one of the two redundant filter trains as soon as plant conditions permit. Stopping one train is accomplished by depressing the STOP pushbutton, thus returning it to the STANDBY condition. This allows automatic restart of the filter train upon failure of the operating train.</p>		
<p>Distracters: A. The RESET pushbutton will reset the system after the initiation signal has cleared. It does not place a filter train in standby for low flow condition C and D. The exhaust damper will go open on an initiation signal, but its limit switch is not what causes the filter train to start. The inlet damper going full open initiates the system</p>		
<p>K/A Match The applicant must have the ability to predict how a low reactor water signal will affect the plant ventilation and what actions must be taken to control systems after the abnormal event.</p>		
<p>Technical References: STM-403 LSK-27-15A</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0257 Obj.5 Discuss the operation of the Standby Gas Treatment System including: (3) a) Automatic initiation/trip signals b) Interlocks/logic of the filter trains/components</p>		
Question Source:	Bank	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	

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SRO Only Justification: N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
290001 (SF5 SC) Secondary Containment Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8). A4.05 Fuel building differential pressure	Tier	2
	Group #	2
	K/A	290001 A4.05
	Rating	3.3
	Revision	1
Revision Statement: Completely rewrote the question.		

Question: 36

Fuel Building Ventilation is operating in Refuel Mode.

- HVF-FN3A, EXH FLTR TRAIN running
- HVF-ACU1 FN1A, FUEL BLDG SPLY FAN A running

During movement of irradiated fuel, RMS-RE5A, FUEL BLDG VENT EXH, goes into ALARM.

10 minutes after the transient (with **NO** Operator action):

Fuel Building Supply Air flow will __(1)__, and Fuel Building Differential Pressure will __(2)__.

- | | |
|--------------------|-----------------|
| (1) | (2) |
| A. lower | rise |
| B. lower | remain the same |
| C. remain the same | rise |
| D. remain the same | remain the same |

Answer: A

Explanation:

During movement of recently irradiated fuel assemblies in the Fuel Building, the normal supply (HVF-FN1A and 1B) remains in service, exhaust fans (HVF-FN8A and 8B) are secured, and a Fuel Building charcoal filtration unit (HVF-FLT2A or 2B) would be on. HVF-AOD122 (101)/37A (B), FUEL BUILDING VENTILATION DAMPERS override control switches are provided to allow the operator to override a high-high radiation signal during fuel handling operations. This option should be used during fuel handling activities only. If it is desired to supply fresh outside air to the Fuel Building during refueling operation with a High-High Radiation signal present, then the

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DIVISION 1(2) RADIATION OVERRIDE switches may be placed in OVRD allowing HVF-AOD122 (101), FUEL BLDG AIR SPLY ISOL, to be opened.

If a Div. 1(2) LOCA (RPV Level 2 or 1.68 psid DW Pressure) signal, Fuel Building Exhaust **High-High Radiation** signal are present the following occur:

- HVF-AOD122 (101), Fuel Bldg Inlet Isolation Dampers, close
- HVF-AOD37A (B), FUEL Bldg Alt Air Supply Dampers, open
- HVF-FN1A (B), Fuel Bldg Supply Fan A(B), trips due to HVF-AOD101(122) damper position
- Fuel Building Filter Train A (B) starts and draws air from the across the Fuel Pool areas, and discharges it to the Fuel Building Exhaust Stack.

The RMS-RE5A high radiation signal will isolate the Fuel Building inlet supply, tripping the Supply Fans causing supply air to lower. The low supply flow will cause the standby exhaust filter train to auto start causing an increase in fuel building DP.

Distracters:

B. Supply flow will lower when the supply air fans trip off. DP will rise due to autostart of the standby filter train. Applicant may think the opening of the alternate air dampers along with the filter train recirc damper modulating, that DP will remain the same.

C. Supply flow will lower when the supply air fans trip off

D. Supply flow will lower when the supply air fans trip off

K/A Match

The applicant must have the ability to monitor the Fuel Building differential pressure response to a loss of exhaust ventilation

Technical References:

R-STM-0406

ARP-863-75

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0406-LO Obj.9

Given a set of conditions and a drawing of the controls, instrumentation and/or Annunciators located in the Main Control Room, identify the status of the Fuel Building HVAC System by evaluation of the controls/ instrumentation/ alarms.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X

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Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
290003 (SF9 CRV) Control Room Ventilation Knowledge of the physical connections and/or cause-effect relationships between CONTROL ROOM HVAC and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8) K1.04 Nuclear steam supply shut off system (NSSSS/PCIS)	Tier	2
	Group #	2
	K/A	290003 K1.04
	Rating	3.2
	Revision	1
Revision Statement: Reordered the distractors		

Question: 37

Which of the following valves has more than 2 isolation signals?

- A. SWP-MOV4A, DRYWELL UC SUPPLY
- B. HVC-MOV1A, CR AHU OUTSIDE SPLY
- C. IAS-MOV106, INSTR AIR OUTDB ISOL
- D. WCS-MOV172 BW TK DR OUTBD ISOL ISOL

Answer: B
Explanation: Per AOP-3, Automatic Isolations HVC-MOV1A isolates on the following signals <ul style="list-style-type: none"> • Reactor Vessel Water Level - Low Low: LEVEL 2: -43 inches • Drywell Pressure - High: 1.68 psid • Control Room Ventilation High Radiation: 8.4 x 10⁻⁶ Ci/cc
Distractors: All distractors are plausible if applicant confuses other system isolation signals. Per EOP-3, Automatic Isolations, following have B & D isolations. B Reactor Vessel Water Level - Low Low: LEVEL 2: -43 inches D Drywell Pressure - High: 1.68 psid A. HVN-MOV127, B, D C. IAS-MOV106, B, D D. SWP-MOV4A, B, D
K/A Match The applicant must have the knowledge of how the NSSSS logic system interfaces with the Control Room HVAC system

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Technical References: R-STM-0402		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0402-LO Obj.7 Describe the controls, indications and/or interlocks for the following: HVC-MOV1A/B, Main Control Room ACU Supply Valves		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
290002 (SF4 RVI) Reactor Vessel Internals Knowledge of the operational implications of the following concepts as they apply to REACTOR VESSEL INTERNALS: (CFR: 41.5 / 45.3) K5.07 Safety limits	Tier	2
	Group #	2
	K/A	290002 K5.07
	Rating	3.9
	Revision	1
Revision Statement: Reordered the distractors		

Question: 38

The Safety Limit for Reactor Coolant System Pressure, as measured in the reactor steam dome, is equivalent to 110% of the design pressure of Recirc_____.

- A. pump casing
- B. suction piping upstream of the pump
- C. discharge piping downstream of the discharge valve
- D. discharge piping between the pump and the discharge valve

Answer: B
Explanation: Safety Limits B 2.1.2 The maximum transient pressure allowable in the RCS pressure vessel under the ASME Code, Section III, is 110% of design pressure. The maximum transient pressure allowable in the RCS piping, valves, and fittings is 110% of design pressures of 1250 psig for suction piping, 1650 psig for discharge piping between the pump and the discharge valve, and 1550 psig beyond the discharge valve. The most limiting of these allowances is the 110% of the suction piping design pressure; therefore, the SL on maximum allowable RCS pressure is established at 1325 psig as measured at the reactor steam dome.
Distractors: A,C, and D. All these sections are plausible because they are listed in the bases.
K/A Match The applicant must have knowledge of the safety limits what is most limiting for the Reactor Vessel
Technical References:

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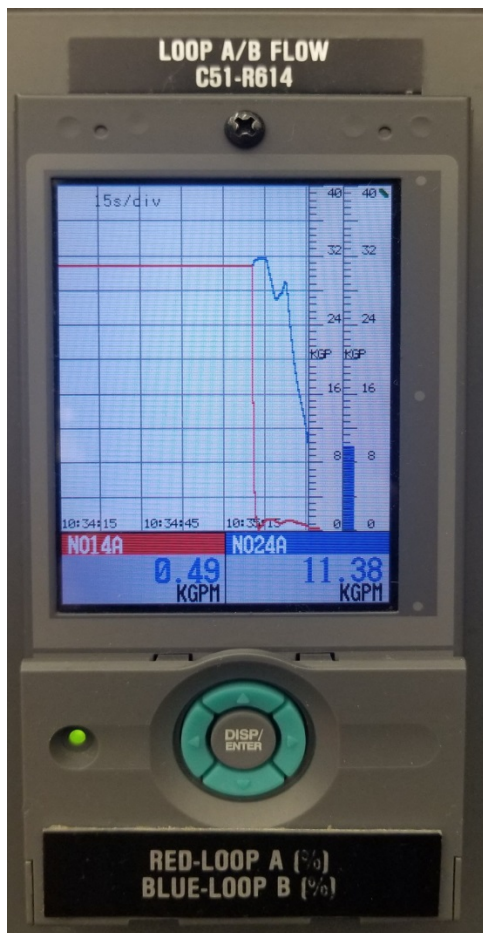
T.S. 2.1.2		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-HLO-0401 Obj.6 Describe the bases for the Reactor Steam Dome Pressure Safety Limit.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.3	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295001 (APE 1) Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: (CFR: 41.5 / 45.6) AK3.01 Reactor water level response	Tier	1
	Group #	1
	K/A	295001 AK3.01
	Rating	3.4
	Revision	0
Revision Statement:		

Question: 39

While operating at 100% power, RBS experienced the following transient:



Recirculation Pump A has __ (1) __.

INITIALLY this transient would cause Reactor Water Level to __ (2) __.

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- | | |
|------------|-------|
| (1) | (2) |
| A. tripped | rise |
| B. tripped | lower |
| C. seized | rise |
| D. seized | lower |

Answer: C		
Explanation: The case of recirculation pump seizure represents the instantaneous stoppage of the pump motor shaft of one recirculation pump. This event produces a very rapid decrease of core flow as a result of the large hydraulic resistance introduced by the stopped rotor. The operator should ascertain that the reactor water will rise from swell.		
Distracters: A and B. Recirc Pump tripping would show a coastdown of loop flow instead of an immediate stoppage of flow as seen by the red pen indicator. D. Recirc Pump seizing would downcomer level to rise. Reactor water level is sensed in the downcomer region.		
K/A Match The applicant must have the knowledge of Reactor Water level response to a loss of forced circulation.		
Technical References: USAR CHAPTER 15.3		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-HLO-CORE FLOW DECREASE EVENTS Given a core flow decrease event and associated plant parameter curves, identify the expected plant automatic actions.(Obj.1)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X

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Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.2	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295003 (APE 3) Partial or Complete Loss of AC Power / 6 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: (CFR: 41.8 to 41.10) AK1.03 Under voltage/degraded voltage effects on electrical loads	Tier	1
	Group #	1
	K/A	295003 AK1.03
	Rating	2.9
	Revision	1
Revision Statement: Reordered the distractors		

Question: 40

The HPCS Pump has been started to perform STP-203-6305,HPCS QUARTERLY PUMP AND VALVE OPERABILITY TEST.

E22-S004 Bus Voltage has degraded to 3800 VAC and stabilized.

What effect does this on the HPCS Pump/System?

The HPCS Pump will....

- A. continue to operate at a higher amperage until manually secured
- B. trip on overfrequency and restart when bus voltage is restored automatically
- C. trip on undervoltage and not restart when bus voltage is restored automatically
- D. stop when the bus feeder breaker trips and restart when bus voltage is restored automatically

Answer: A

Explanation:

The E22-S004 is rated at 4160 Vac. Operating at 3800 Vac is ~91% of rated. This is above the undervoltage setpoint of 89% which would cause an auto start of the Div 3 diesel and tripping of the offsite feeder breaker. The HPCS Pump will continue to operate but at a higher amperage because of the power equation $P=IA$.

Distractors:

- B.**This situation would occur if the bus voltage would lower below 89%. Voltage 3800 Vac~91%,no automatic actions would occur.
- C.**The HPCS Pump does not trip due to a undervoltage condition. This is plausible because most large equipment in the plant does trip on undervolatge.

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D. The HPCS Pump does trip on an overfrequency event, however, the drop in voltage has no effect on frequency.		
K/A Match The applicant must have the knowledge of how a degraded voltage condition will affect loads on that bus		
Technical References: R-STM-0203		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0203-LO Obj. 18 Given a set of plant conditions, explain how the HPCS System will respond to the status of the following systems: Electrical Power		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295004 (APE 4) Partial or Total Loss of DC Power / 6 2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)	Tier	1
	Group #	1
	K/A	295004 2.2.22
	Rating	4.0
	Revision	1
Revision Statement: Rewrote the question		

Question: 41

Initial Conditions:

- MODE SWITCH in START & HOT STBY
- Reactor Coolant Temperature is 130°F
- NO Testing in progress

The Supply Breaker, ENB-ACB565, to ENB-MCC1 has tripped open.

Based on these conditions, the Plant is in MODE __ (1) __, and should enter LCO __ (2) __.

- | | |
|------|---------------------------------------|
| (1) | (2) |
| A. 2 | 3.8.1 AC Sources- Operating |
| B. 2 | 3.8.9 Distribution Systems- Operating |
| C. 4 | 3.8.2 AC Sources- Shutdown |
| D. 4 | 3.8.10 Distribution Systems- Shutdown |

Answer: B
Explanation:

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Table 1.1-1 (page 1 of 1)
MODES

MODE	TITLE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE (°F)
1	Power Operation	Run	NA
2	Startup	Refuel ^(a) or Startup/Hot Standby	NA
3	Hot Shutdown ^(a)	Shutdown	> 200
4	Cold Shutdown ^(a)	Shutdown	≤ 200
5	Refueling ^(b)	Shutdown or Refuel	NA

(a) All reactor vessel head closure bolts fully tensioned.

(b) One or more reactor vessel head closure bolts less than fully tensioned.

With the MODE Switch in Startup/Hot Standby the Plant is in MODE 2 regardless of coolant temperature. Coolant only determines MODE if the MODE switch is in the Shutdown position.

ENB-MCC1 is a 125 Vdc distribution bus that only supplies power to RCIC components.

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	NOMINAL VOLTAGE	DIVISION I*	DIVISION II*	DIVISION III*
AC Electric Power Distribution System	4160 V	1ENS*SWG1A**	1ENS*SWG1B**	1E22*S004**
	480 V LDCs	1EJS*LDC1A** 1EJS*LDC2A**	1EJS*LDC1B** 1EJS*LDC2B**	---
	480 V MCCs	1EHS*MCC2A 2C, 2E, 2G, 2J, 2L, 8A, 14A, 15A, 16A	1EHS*MCC2B 2D, 2F, 2H, 2K, 8B, 14B, 15B, 16B	1E22*S002**
	120 V Dist. Panels	1SCV*PNL2A1 2A2, 2C1, 2J1, 2L1, 8A1, 14A1, 15A1, 16A1	1SCV*PNL2B1 2B2, 2D1, 2K1, 8B1, 14B1, 15B1, 16B1	1E22*S002 PNL
AC Vital Bus Electric Power Distribution System	120 VAC	1VBS*PNL01A**	1VBS*PNL01B**	---
DC Electric Power Distribution System	125 V	1ENB*SWG01A**	1ENB*SWG01B**	---
	Dist. Panels	1ENB*PNL02A 03A, 04A 1ENB*MCC1	1ENB*PNL02B 03B	1E22*S001 PNL**

Distracters:

A. MODE 2 is the correct MODE, but ENB-MCC1 is not an AC source. The applicant may assume because it is label an MCC that it might fall under an AC source.

C. Wrong MODE. And also not an AC source

D. Wrong MODE, but this is the correct LCO

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K/A Match		
The applicant must have knowledge of how a partial loss of DC would affect a system's LCO status		
Technical References:		
T.S. 3.8.9 R-STM-0305		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0305-LO Obj.7 Identify the Technical Specifications, Technical Requirements Manual, and/or Bases requirements for the DC Electrical Distribution System.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		
DC-ENG, Safety Related DC Power #7 Risk Significant System		

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Examination Outline Cross Reference	Level	RO
295005 (APE 5) Main Turbine Generator Trip Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: (CFR: 41.5 / 45.6) AK3.04 Main generator trip	Tier	1
	Group #	1
	K/A	295005 AK3.04
	Rating	3.2
	Revision	2
Revision Statement:		
Rev 1 Rewrote the question		
Rev 2 modified the distractor analyses		

Question: 42

An Anti-Motoring circuit trips the Main Turbine Generator during a motoring event. During a motoring event, the generator operates as synchronous motor driving the turbine.

Under these conditions, the Anti-Motoring circuit will trip the Main Turbine Generator to prevent _____.

- A. excessive turbine vibration
- B. turbine blade overheating
- C. excessive magnetic flux in the generator
- D. phase to phase faults in the stator windings

Answer: B

Explanation:

The generator is protected against anti-monitoring by circuit 1SPUN04. Motoring of the generator occurs when the steam flow to the turbine is reduced to less than no-load flow when the generator is still on the line. Under these conditions, the generator operates as a synchronous motor driving the turbine. The turbine blades can be subjected to overheating as a result of motoring. If excitation along with steam flow is lost, slip currents is produced in the rotor and overheating can occur.

Distracters:

- A.** Motoring of the Turbine Generator will not increase or decrease turbine vibration due to speed remaining constant.
- C.** The main generator is protected against harmful Volts/Hz conditions by Volts/Hertz relay. Excessivemagnetic flux in the generator can cause overheating and possible localized melting of the generator core laminations. This does occur due to a motoring event

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<p>D. A unit differential relay, 87U, monitors the generator for a current imbalance condition on the three phases. This relay monitors the current flow on the phases and if a current imbalance is sufficient to trip the relay, a generator trip occurs. This relay provides protection against phase-to-phase faults in the stator windings. This is not caused by a motoring event.</p>											
<p>K/A Match The applicant must have the knowledge of the reasons for Main Generator trips.</p>											
<p>Technical References: R-STM-0310</p>											
<p>Handouts to be provided to the Applicants during exam: NONE</p>											
<p>Learning Objective:</p>											
<table border="1"> <tr> <td>Question Source:</td> <td>Bank #</td> <td></td> </tr> <tr> <td>(note changes and attach parent)</td> <td>Modified Bank #</td> <td></td> </tr> <tr> <td></td> <td>New</td> <td>X</td> </tr> </table>			Question Source:	Bank #		(note changes and attach parent)	Modified Bank #			New	X
Question Source:	Bank #										
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	New	X									
<table border="1"> <tr> <td>Question Cognitive Level:</td> <td>Memory / Fundamental</td> <td>X</td> </tr> <tr> <td></td> <td>Comprehensive / Analysis</td> <td></td> </tr> </table>			Question Cognitive Level:	Memory / Fundamental	X		Comprehensive / Analysis				
Question Cognitive Level:	Memory / Fundamental	X									
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<table border="1"> <tr> <td>10CFR Part 55 Content:</td> <td>41.b.7</td> <td></td> </tr> </table>			10CFR Part 55 Content:	41.b.7							
10CFR Part 55 Content:	41.b.7										
<table border="1"> <tr> <td>Level of Difficulty:</td> <td>3</td> <td></td> </tr> </table>			Level of Difficulty:	3							
Level of Difficulty:	3										
<p>SRO Only Justification: N/A</p>											
<p>PRA Applicability:</p>											

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Examination Outline Cross Reference	Level	RO
295006 (APE 6) Scram Ability to operate and/or monitor the following as they apply to SCRAM: (CFR: 41.7 / 45.6) AA1.07 Control rod position	Tier	1
	Group #	1
	K/A	295006 AA1.07
	Rating	4.1
	Revision	1
Revision Statement: Changed LOD to 2 from 3		

Question: 43

The reactor has just scrammed.

The scram has not been reset.

The ATC Operator could verify that all control rods are fully inserted by depressing ALL RODS with RC&IS with RAW DATA__ (1)__ and observe all control rods position indicate __ (2)__ with only green LEDs.

- | | |
|---------------|-----|
| (1) | (2) |
| A. selected | -- |
| B. selected | 00 |
| C. deselected | -- |
| D. deselected | 00 |

Answer: A & D

Explanation:

The immediate operator actions of AOP-1 require the operator to verify all control rods are fully inserted. When ALL RODS is depressed, it displays all the rod two digit positions on the full core display. The "ALL" LED in the "ROD POSITION" display will also be lighted. RAW DATA being selected causes RACS to either send position data directly from RPIS without correction, including "odd" and "blank" positions which are suppressed in the normal mode, or to send only even notch position data for display.

Changed answer key post exam to also accept D as a correct answer. If RAW DATA is deselected, pressing ALL RODS results in "00" display.

Distracters:

B. RAW DATA being selected would show " _ " for control rod position.

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C and D. RAW DATA should be selected to verify “__” position.		
K/A Match The applicant must have the ability to determine control rod position after a reactor scram		
Technical References: AOP-1 R-STM-0500		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-HLO-0520 Obj.4 Describe the immediate and subsequent operator actions required by AOP-001, reactor Scram.		
Question Source: (note changes and attach parent)	Bank Modified Bank # New	 X
Question Cognitive Level:	Memory / Fundamental Comprehensive / Analysis	 X
10CFR Part 55 Content:	41b.7	
Level of Difficulty:	2	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295016 (APE 16) Control Room Abandonment Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT: (CFR: 41.10 / 43.5 / 45.13) AA2.05 Drywell pressure	Tier	1
	Group #	1
	K/A	295016 AA2.05
	Rating	3.8
	Revision	1
Revision Statement: Removed the first sentence from the stem, and reordered the distractors		

Question: 44

Which of the following primary Containment parameters can be **DIRECTLY** monitored from RSS-PNL102, DIV 2 Remote Shutdown Panel?

- A. Drywell Pressure
- B. Containment Pressure
- C. Containment Temperature
- D. Drywell Hydrogen Concentration

Answer: A
Explanation: The Containment Atmosphere Monitoring (CMS) system provides instrumentation for Drywell temperature, Drywell pressure, Suppression Pool temperature, and Suppression Pool level. Availability of these indications is needed to ensure proper monitoring of key Containment parameters necessary to ensure safe shutdown and cooldown of the plant. These indications can be found at RSS-PNL101 on CMS-TR103, a multi-point digital recorder with strip chart and digital readout presentation, and on six separate meters on RSS-PNL102.
Distractors: All the other parameters are primary containment values, however, they can not be read directly from either remote shutdown panel.
K/A Match The applicant must have the knowledge of which parameters can be read from the remote shutdown panels after the control room has been abandoned.
Technical References: R-STM-0200

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Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0200-LO Obj.5 Identify the Containment parameters monitored by RSS.		
Question Source: (note changes and attach parent)	Bank # Modified Bank # New	 X
Question Cognitive Level:	Memory / Fundamental Comprehensive / Analysis	 X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295018 (APE 18) Partial or Complete Loss of CCW Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: (CFR: 41.8 to 41.10) AK1.01 Effects on component/system operations	Tier	1
	Group #	1
	K/A	295018 AK1.01
	Rating	3.5
	Revision	1
Revision Statement: Reordered the distractors		

Question: 45

The plant is currently in a refueling outage (MODE 5)

- RHR B is in Shutdown Cooling Mode.
- RWCU is rejecting to Radwaste
- The upper containment fuel pool gate is open and water level is >23 ft over the top of the reactor pressure vessel flange
- Reactor coolant temperature is 98°F

The following indications are in the Main Control Room:



How would this affect RHR B Shutdown Cooling operation?
RHR B would_____.

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- A. trip to prevent overheating the motor
- B. continue to operate without seal cooling
- C. continue to operate without motor cooling
- D. trip to prevent overheating of the pump seals

Answer: B		
Explanation: The picture shows that a DIV 1 56 psig isolation has occurred due to lights being lit. A DIV 1 or DIV 2 isolation signal will cause both safety loops of CCP to isolate. RHR B seal cooler is a load on the B CCP safety loop. The 56 psig isolation will not cause a RHR pump trip.		
Distracters: A and D. CRD system does get cooling from the B safety loop of CCP as well, and it trips on a 56 psig isolation signal. The applicant may get RHR and CRD confused. C. CCP provides cooling to the pump seals, not the motor.		
K/A Match The applicant must have the knowledge of how a partial loss of CCP affects the RHR system.		
Technical References: R-STM-0115		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0115-LO Obj.11 Given a set of plant conditions, predict the effect that a loss or malfunction of the Reactor Plant Component Cooling Water System will have on the following: a. Loads cooled by RPCCW		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X

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10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	4	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295019 (APE 19) Partial or Complete Loss of Instrument Air Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR and the following: (CFR: 41.7 / 45.8) AK2.07 Condensate system	Tier	1
	Group #	1
	K/A	295019 AK2.07
	Rating	3.2
	Revision	1
Revision Statement: Reordered distractors D-B-A-C, making D the correct answer.		

Question: 46

While operating at 100% Power, the plant experiences a loss of instrument air.

Concerning the Condensate System, which of the following represents a correct valve lineup after this event?

- A. CNS-LCV105, Hotwell Reject Valve, fails open
- B. CNM-FCV112, Condensate Bypass Valve, fails close
- C. CNS-LCV103, Normal Hotwell Makeup Valve, fails close
- D. CNM-FCV114, Condensate Recirculation Valve, fails open

Answer: D
Explanation: A loss of instrument air will cause CNM-FCV114 to fail open, CNM-FCV-112 to fail open, CNS-LCV105 to fail close, and CNS-LCV103 to fail open.
Distracters: See above explanation
K/A Match The applicant must knowledge of how a loss of instrument air will affect the condensate system
Technical References: R-STM-0104
Handouts to be provided to the Applicants during exam: NONE
Learning Objective:

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RLP-STM-0104 Obj.14 Given a set of plant conditions, predict the consequences a loss or malfunction of the following will have on the Condensate system: A.Plant Air System		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295021 (APE 21) Loss of Shutdown Cooling Ability to operate and/or monitor the following as they apply to LOSS OF SHUTDOWN COOLING: (CFR: 41.7 / 45.6) AA1.01 Reactor water cleanup system	Tier	1
	Group #	1
	K/A	295021 AA1.01
	Rating	3.4
	Revision	1
Revision Statement: Removed that Shutdown Cooling was lost from the stem, and reordered the distractors.		

Question: 47

Operating in MODE 4, the Main Control Room receives a spurious Level 3 signal.
(All automatic actions occur)

With the isolation signal sealed in, what system could provide BOTH alternate decay heat removal AND coolant temperature indication?

- A. LPCS
- B. RWCU
- C. RHR-FPC
- D. SPC-ADHR

Answer: B
Explanation: The RWCU system has the capability to remove decay heat using the Non-Regen Heat exchangers rejecting heat to the CCP system. RWCU suction has temperature indication as well to allow the operator to monitor RPV coolant temperature.
Distractors: A. Level 3 isolation would prevent the use of the ADHR system. C. RHR-FPC could not be used while in MODE 4 because the reactor head is still on and the RPV hasn't been flooded up. D. Plausible if applicant confuses alternate decay heat removal and adequate core cooling, because LPCS could provide adequate core cooling by maintaining reactor water level.
K/A Match The applicant must have the ability to operate and monitor the RWCU after a loss of Shutdown Cooling.

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Technical References: SOP-90 OSP-41		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-HLO-0543 Obj.7 Describe the immediate (if applicable) and subsequent operator actions associated with AOP-0051, Loss of Decay Heat Removal.		
Question Source: (note changes and attach parent)	Bank # Modified Bank # New	 X
Question Cognitive Level:	Memory / Fundamental Comprehensive / Analysis	 X
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295023 (APE 23) Refueling Accidents Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS: (CFR: 41.7 / 45.6) AA1.06 Neutron monitoring	Tier	1
	Group #	1
	K/A	295023 AA1.06
	Rating	3.3
	Revision	2
Revision Statement:		
Rev 1 Rewrote the question to better meet the K/A		
Rev 2 Rewrote the question to a 2x2 with added SRM indications.		

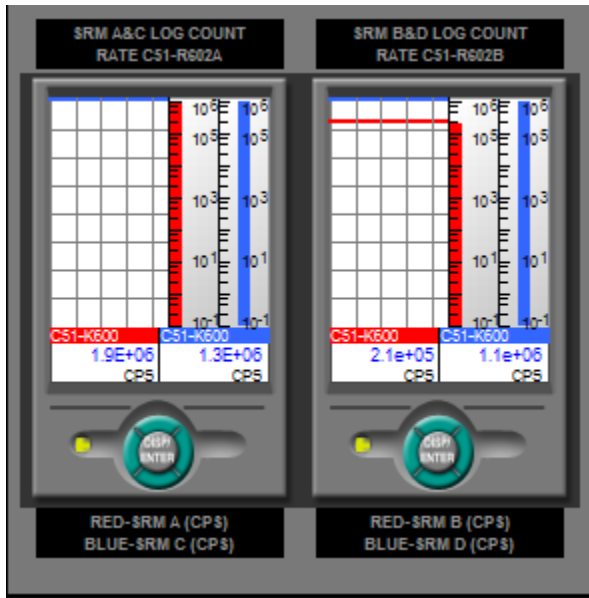
Question: 48

The following plant conditions exist:

- Mode 5
- Core alterations in progress
- Shorting Links installed

A Fuel misloading event has resulted in Inadvertent Criticality which is defined as an UNPLANNED __ (1) __ period.

The following indications are observed on the H13-P680 panel.



This would result in a __ (2) __.

(1)

(2)

A. stable positive

Control Rod Block ONLY

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- B. stable positive Control Rod Block AND Reactor Scram
- C. short term positive Control Rod Block ONLY
- D. short term positive Control Rod Block AND Reactor Scram

Answer: A		
Explanation: A sustained and stable positive period signal critically due an ever increasing thermal neutron population. A short positive period is the result of the rise in neutron population due to subcritical multiplication. A negative period(short or sustained) is a decreasing thermal neutron population which result in becoming more subcritical. The SRM meters indicate that count rate has exceeded the control rod block and scram setpoints. With the shorting links installed, the scram signal is bypassed.		
Distracters: B. Stable positive period is indication of Inadvertent criticality, the SRM indications would lead to a control rod block with the shorting links installed. C. A short term positive is not a true indication of inadvertent criticality D. A short term positive is not a true indication of inadvertent criticality		
K/A Match The applicant must have the ability to monitor the neutron monitoring system after a Refueling Accident		
Technical References: AOP-0027		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective:		
Question Source:	Bank # 2008 NRC #10	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	

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10CFR Part 55 Content:	55.41 b.1	
Level of Difficulty:	2	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295024 High Drywell Pressure Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.8 to 41.10) EK1.02 Containment building integrity	Tier	1
	Group #	1
	K/A	295024 EK1.02
	Rating	3.9
	Revision	1
Revision Statement: Reordered the distractors making D the correct answer.		

Question: 49

During a high drywell pressure event, which of the following describes the containment function which aids in avoiding challenges to containment integrity due to the high drywell pressure condition?

- A. Horizontal vents provide a path from the containment to drywell to allow equalization of pressure.
- B. The Suppression pool prevents non-condensable gases from being released into the containment atmosphere
- C. Energy suppression is accomplished by maintaining adequate suppression pool level above the SRV discharge spargers.
- D. Suppression pool level in the appropriate range ensures adequate quenching of energy prior to release to the containment atmosphere.

Answer: D
Explanation: A buildup of steam pressure in the Drywell forces the water in the wetwell, area between the Drywell wall and the Weir Wall, down until the water is depressed to the top of the first row of horizontal vents and allows the steam to be vented into the Suppression Pool and condensed. A&D - Horizontal vents only provide the path from the DW to Cnmt. They do not suppress the energy in the DW. C – Adequate SP Level is important for quenching the energy from the RPV when the SRVs are used for pressure control, but the energy from a high drywell pressure condition does not flow through the SRVs. B - Adequate suppression pool level will quench the energy from the steam in the drywell as the elevated condition causes a clearing of the vents. The volume of water in the pool actually suppresses this energy.
Distractors: A. Horizontal vents only provide the path from the DW to Cnmt. They do not suppress the energy in the DW.

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C. Adequate SP Level is important for quenching the energy from the RPV when the SRVs are used for pressure control, but the energy from a high drywell pressure condition does not flow through the SRVs.

D. The Suppression Pool only condenses the steam. Non-condensable gases are still released into the Ctmt air space.

K/A Match

The applicant must have knowledge of the suppression pool's role in preventing high drywell pressure from challenging the integrity of primary containment.

Technical References:

R-STM-0057

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0057 Obj 3

Describe the purpose, construction, and operation of the following components and/or subsystems: Suppression Pool

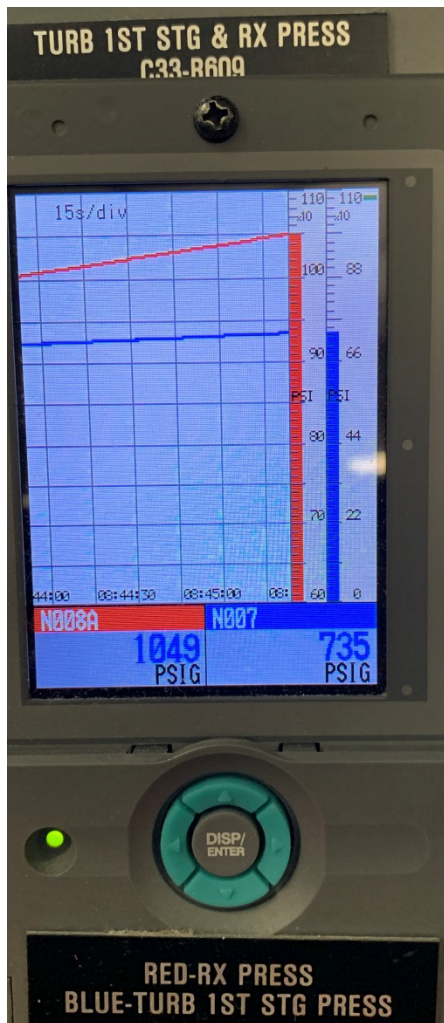
Question Source:	Bank # March 2010 Audit	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41(b)(9)	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295025 (EPE 2) High Reactor Pressure / 3 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	Tier	1
	Group #	1
	K/A	295025 2.1.7
	Rating	4.4
	Revision	0
Revision Statement: Enhanced the explanation statement to clarify the difference between the two indications.		

Question: 50

Based on indications provided, per AOP-17, Reactor Pressure Control Malfunctions, when should ATC insert a manual scram?



A. 600 psig and lowering

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- B. 875 psig and lowering
- C. 1075 psig and rising
- D. 1094 psig and rising

Answer: C

Explanation:

The recorder has two pressure parameters: The RED pen is Reactor Pressure, and the BLUE pen is 1st Stage Turbine Pressure. Applicant must be able to recognize the correct pressure parameter.

100% reactor power is normally 1049 reactor pressure. Applicant must interpret the rising pressure indications. Based on the rising pressure, AOP-17, immediate actions state, "4.1 IF either of the following conditions exist due to a malfunction of the Reactor Pressure Control System, THEN place C71A S1, REACTOR SYSTEM MODE SWITCH, to SHUTDOWN.

- Reactor pressure is 1075 psig and rising.

Distracters:

A. Per OSP-53, 1.3.2. IF there is an event resulting in an uncontrolled pressure drop, THEN perform the following:

1. IF it can be determined that pressure will drop below 600 psig before the condition can be corrected, THEN close MSIVs by 600 psig. Outboard MSIVs are preferred to provide maximum drain paths.

B. Per AOP-17, 4.1 IF either of the following conditions exist due to a malfunction of the Reactor Pressure Control System, THEN place C71A S1, REACTOR SYSTEM MODE SWITCH, to SHUTDOWN. • Reactor pressure is 875 psig and lowering.

D. Per REACTOR HIGH PRESSURE, H13-P680 / 03A / A09, A reactor scram will result if pressure reaches 1094.7 psig.

K/A Match

The applicant must have the ability to evaluate the plants response to High Reactor Pressure and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Technical References:

AOP-17

OSP-53

REACTOR HIGH PRESSURE, H13-P680 / 03A / A09

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

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RLP-OPS-AOP0017-LO Obj.4 Describe the immediate and subsequent operator actions required by AOP-0017, Reactor Pressure Control Malfunctions.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.10	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

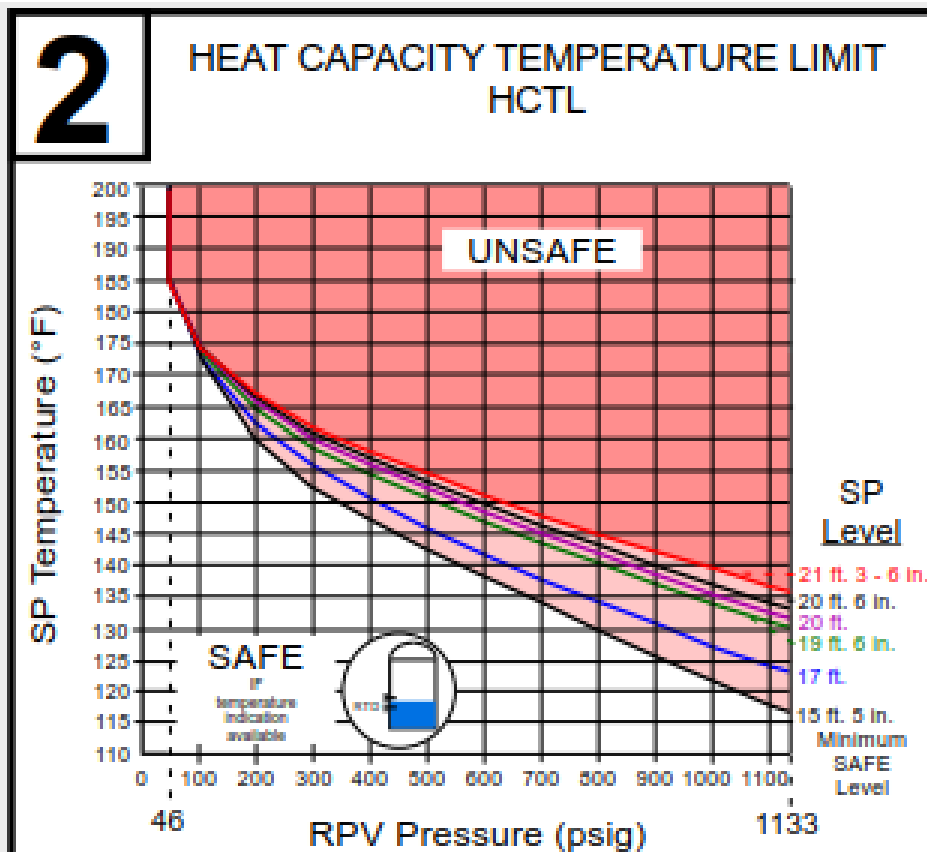
Examination Outline Cross Reference	Level	RO
295026 (EPE 3) Suppression Pool High Water Temperature Ability to determine and/or interpret the following as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE: (CFR: 41.10 / 43.5 / 45.13) EA2.02 Suppression pool level	Tier	1
	Group #	1
	K/A	295026 EA2.02
	Rating	3.8
	Revision	2
Revision Statement: Rewrote the question to better meet the K/A Rev 2: Changed suppression pool temperature to 132.		

Question: 51

A major plant transient has caused Suppression Pool Temperature to rise.

Plant conditions after transient:

- Suppression Pool Temperature is 132°F
- Reactor pressure band of 800 psig to 1090 psig



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What is the **MINIMUM** SAFE Suppression Pool Level needed to operate within the full range of the pressure band?

- A. 15ft 5in
- B. 17ft 0in
- C. 19ft 6in
- D. 20ft 0in

Answer: C		
Explanation: With suppression pool temperature at 130°F and Reactor pressure at 1090 psig(top of the band) the minimum safe suppression pool level is 19ft 6in according to the HCTL curve.		
Distracters: A. If the applicant uses the lower end of the pressure band(800 psig), 15ft 5in would be a plausible answer. B. If the applicant uses the lower end of the pressure band(800 psig), 17ft 0in would be a plausible answer. D. 20ft is a safe level, however, it is not the MINIMUM safe level.		
K/A Match The applicant must the ability to determine/interpret Suppression Pool Level using parameters given and applicable HCTL curve.		
Technical References: EOP-1 EPSTG*0002		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-OPS-HLO-517 Obj.2 Given the EOPs/SAPs and plant conditions, discuss the bases for each curve and variable and determine if the plant is in the Safe or Unsafe region of the curve or within the limits of the variable.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	

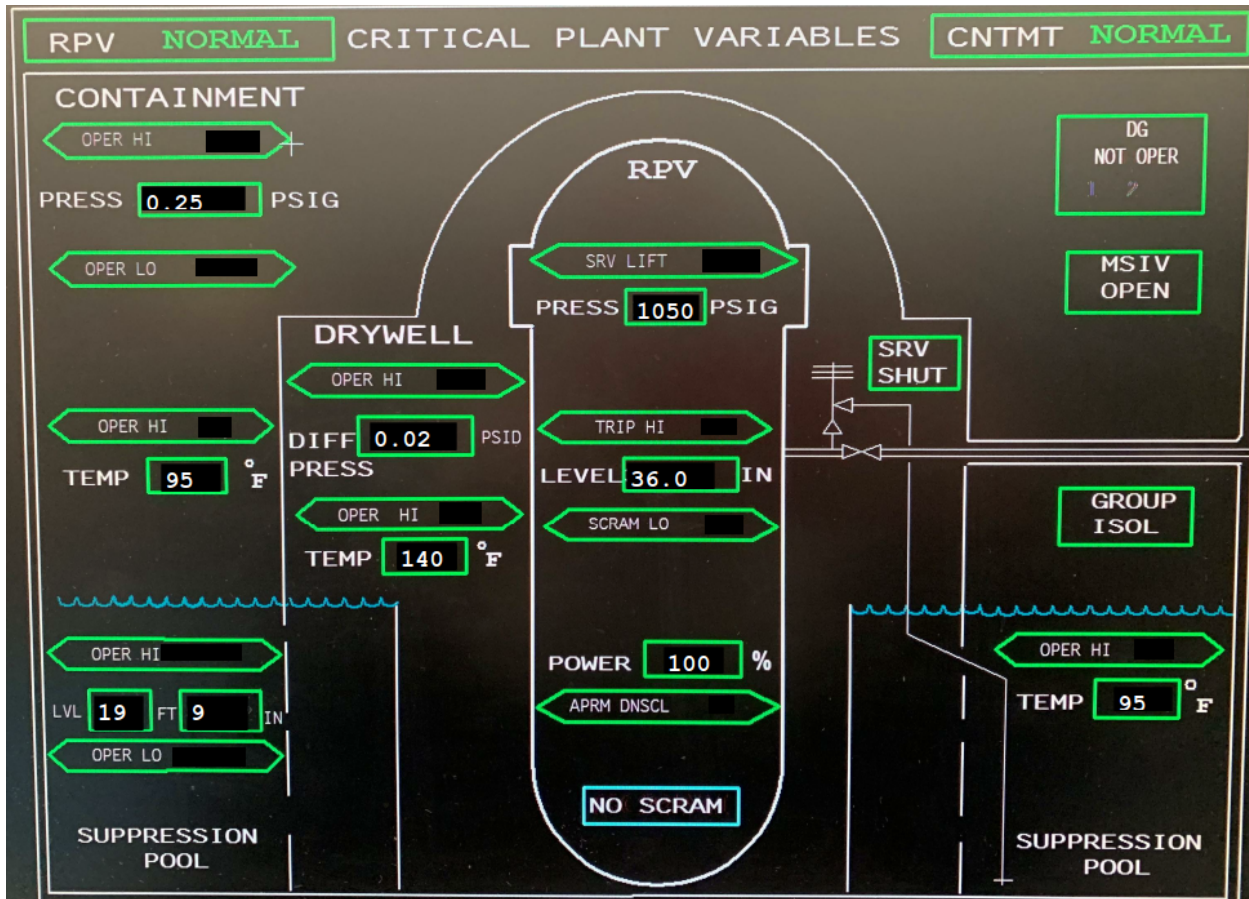
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	New	X
Question Cognitive Level:		
	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:		
	41.b.10	
Level of Difficulty:		
	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

Examination Outline Cross Reference	Level	RO
295027 (EPE 4) High Containment Temperature (Mark III Containment Only) Ability to determine and/or interpret the following as they apply to HIGH CONTAINMENT TEMPERATURE (MARK III CONTAINMENT ONLY): (CFR: 41.10 / 43.5 / 45.13) EA2.01 Containment temperature: Mark-III	Tier	1
	Group #	1
	K/A	295027 EA2.01
	Rating	3.7
	Revision	1
Revision Statement: Removed Drywell temperature and replaced it with Suppression Pool level as a distractor.		

Question: 52

Based on the following indications:



EOP-2, Primary Containment Control, should be entered on _____.

A. Containment Pressure

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- B. Suppression Pool Level
- C. Containment Temperature
- D. Suppression Pool Temperature

Answer: C		
Explanation: Based on the parameters from ERIS, Only one parameter meets the threshold for EOP-2 entry which containment temperature of 95°F. It has exceeded the entry setpoint of 90°F.		
Distracters: All the other parameters are plausible because they are EOP-2 entry parameters.		
K/A Match The applicant must the ability to determine if containment temperature has exceeded the high temperature setpoint entry for EOP-2		
Technical References: EOP-2 T.S 3.6.1.5		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-OPS-HLO-514 Obj.3 List EOP-0002 entry conditions, including setpoints		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.10	
Level of Difficulty:	3	

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SRO Only Justification: N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
295030 (EPE 7) Low Suppression Pool Water Level Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.5 / 45.6) EK3.03 RCIC operation	Tier	1
	Group #	1
	K/A	295030 EK3.03
	Rating	3.6
	Revision	0
Revision Statement:		

Question: 53

EOP-1cautions operating RCIC with its suction align to the Suppression Pool with level below 14 ft.

A Suppression Pool level of 13.6 ft could cause _____.

- A. the RCIC pump to trip on suction pressure
- B. air entrainment at the RCIC pump suction strainer
- C. overheating of the RCIC pump from lack of cooling flow
- D. a challenge to primary containment integrity from RCIC exhaust

Answer: B
Explanation: The most limiting suppression pool water level is 14 ft based on the RCIC Vortex Limits. The most limiting suppression pool temperature is 160.6°F (rounded to 160°F) based on the RCIC NPSH Limit. These values were chosen instead of curves for better usability and to minimize the chance for error - Calc. G13.18.14.4-034, WS-13 and WS-15. This suppression pool water level is a function of flow, and the limit is utilized to preclude RCIC or ECCS damage due to air entrainment.
Distracters: A. RCIC pump will trip on a low suction pressure of 20”Hg abs(~10 ft). C. RCIC pump will still have adequate cooling at this suppression pool level provided by its discharge D. 13.6 ft would provide enough quenching to prevent RCIC exhaust from challenging containment. 15.5 ft suppression level is the low level for the PSP curve would not provide enough quenching due to an Emergency Depressurization event.

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K/A Match		
The applicant must the knowledge of how suppression pool affects the RCIC system		
Technical References:		
EPSTG*002 Caution #5		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-HLO-0511 Obj.6		
Given plant parameters or indications, determine EOP/SAP Cautions applicability.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.10	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295031 (EPE 8) Reactor Low Water Level Knowledge of the interrelations between REACTOR LOW WATER LEVEL and the following: (CFR: 41.7 / 45.8) EK2.06 High pressure (feedwater) coolant injection (FWCI/HPCI)	Tier	1
	Group #	1
	K/A	295031 EK2.06
	Rating	4.1
	Revision	1
Revision Statement: Changed LOD from 3 to 2		

Question: 54

The setpoint setdown feature of the Feed Water Level Control System is activated when Reactor level lowers to (1) and causes the Master Controller output to be (2) than its normal setting when implemented.

- | | |
|---------|--------|
| (1) | (2) |
| A. 9.7" | lower |
| B. 9.7" | higher |
| C. -43" | lower |
| D. -43" | higher |

Answer: A

Explanation:

In the event reactor water level decreases to Level 3(9.7") with the Master Flow Controller in automatic, Setpoint Setdown is initiated. When initiated, it causes the Master Flow Controller to change the level setpoint to 18" after a 5 second time delay. Normal Reactor Water level is 36"

Distracters:

B. The new setpoint will be 18" which is lower than 36"
C and D. -43" is level 2 which would cause other automatic actuations but not Setpoint Setdown.

K/A Match

The applicant must have knowledge of how a low Reactor Water level will affect Feedwater level control and High Pressure injection

Technical References:

R-STM-0107

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Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0107 Obj.4		
State the purpose, setpoints, and operation of the Setpoint Setdown feature of the Master Flow Controller. (4)		
Question Source:		
	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:		
	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:		
	41.b.7	
Level of Difficulty:		
	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295037 (EPE 14) Scram Condition Present and Reactor Power Above APRM Downscale or Unknown / 1 2.4.35 Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)	Tier	1
	Group #	1
	K/A	295037 2.4.35
	Rating	3.8
	Revision	0
Revision Statement:		

Question: 55

The reactor has just scrammed.

All control rods did not go in. Reactor Power is currently 8%

When feedwater flow has stabilized, THEN the MCR provides specific direction to the Auxiliary Control Room_____.

- A. for placing Condensate Demins in/out of service to maintain flows within limits.
- B. opening the CNM-FCV200, Condensate Filtration Vessel Bypass Flow Control Valve, to maintain flow to the condensate demineralizers
- C. removing all Condensate Demins from service once CNM-FCV114, Short Cycle Cleanup, is OPEN to protect the Condensate Pumps.
- D. for placing 2 Condensate Demineralizers in RECYCLE, to provide minimum flow path for the operating Condensate Pumps.

Answer: A

Explanation:

Per AOP-1, WHEN feedwater flow has stabilized to a lower value, THEN provide specific direction to the Auxiliary Control Room for placing Condensate Demins in/out of service to maintain flows within limits.

Distracters:

- B.** opening the CNM-FCV200 would not provide more/less flow to demins.after a scram. Flow would be lowered due Feedwater Level Control demand being lower after a scram.
- C.** removing all Condensate Demins from service would remove ALL high pressure injection (feedwater and condensate) flow to the RPV. Some amount is still needed due residual and decay heat.
- D.**After a scram, high pressure injection is still needed. Minimum flow would provided by the opening of CNM-FCV-114 if needed.

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K/A Match		
The applicant must knowledge of auxiliary operator tasks during an emergency		
Technical References:		
AOP-1 CR-RBS-2015-05469		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-HLO-0520 Obj.4 Describe the immediate and subsequent operator actions required by AOP-001, reactor Scram.		
Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.10	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		
Loss of FW/Cond, Internal Event contributing to Baseline Core Damage Frequency		

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Examination Outline Cross Reference	Level	RO
295038 (EPE 15) High Offsite Radioactivity Release Rate Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE: (CFR: 41.7 / 45.6) EA1.01 Stack-gas monitoring	Tier	1
	Group #	1
	K/A	295038 EA1.01
	Rating	3.9
	Revision	0
Revision Statement:		

Question: 56

Which pair of radiation monitors (outlined in red) takes a sample from an EXHAUST Flow path, and initiates AUTOMATIC actions (isolations/initiations)?



Answer: A

Explanation:

1RMS-RE5A and B are provided in the Fuel building exhaust duct to detect the release of radioactivity to the environment. Upon detection of high airborne activity in the duct, the exhaust air is automatically diverted to the charcoal filter units.

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Distracters:		
B. 1RMS-RE6A and B monitor the Radwaste exhaust flow path but do not initiate any automatic actions.		
C. Same as B.		
D. 1RMS-RE14A and 14B monitor Control Building remote INTAKE flow path and do not initiate any automatic actions. Applicant could confuse with RMS-RE13A and 13B, which can result in an isolation.		
K/A Match		
The applicant must have the ability to monitor High Offsite release rates and how they affect the plant		
Technical References:		
R-STM-0511		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
RLP-STM-0511 Obj.6		
Given a list of radiation monitors, identify which monitors will automatically initiate isolation of monitored system.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.11	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
600000 (APE 24) Plant Fire On Site Ability to operate and / or monitor the following as they apply to PLANT FIRE ON SITE: AA1.08 Fire fighting equipment used on each class of fire	Tier	1
	Group #	1
	K/A	600000 AA1.08
	Rating	2.6
	Revision	0
Revision Statement:		

Question: 57

A class "C" fire has started in panel H13-P601. Manual actuation of the __ (1) __ system would be required in the event that the __ (2) __ firing circuit has failed.

- | | |
|----------|------------|
| (1) | (2) |
| A. Halon | combustion |
| B. Halon | thermal |
| C. CO2 | combustion |
| D. CO2 | thermal |

Answer: B
Explanation: The control room fire protection system provides for fire detection, and automatic and manual suppression via Halon 1301 for panels mounted on the PGCC floor modules. The Main Control Room is divided into Twenty Eight Fire Zones also identified as PGCC floor modules. The under floor portion of these areas is protected by a Halon system which contains two storage containers. The Main Control Room systems differ in that these cylinders are not considered redundant Main/Reserve containers. They are designed to discharge in succession if a thermal detector detects fire. After discharging the first container, the second container discharges automatically after a 7.5 minute time delay.
Distracters: A. The firing circuit utilizes a thermal detector not a combustion detector. C and D. The Main Control uses Halon not CO2 for fire suppression.
K/A Match The applicant must the ability to fight fire in the Main Control room.
Technical References:

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R-STM-0250		
Handouts to be provided to the Applicants during exam: NONE		
Learning Objective: RLP-STM-0250 Obj.5 List the signal(s) including set points that will automatically initiate the Control Room Halon Fire Protection system. (5)		
Question Source: (note changes and attach parent)	Bank # Modified Bank # New	 X
Question Cognitive Level:	Memory / Fundamental Comprehensive / Analysis	 X
10CFR Part 55 Content:	41(b)(8)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
700000 (APE 25) Generator Voltage and Electric Grid Disturbances Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: (CFR: 41.4, 41.5, 41.7, 41.10 / 45.8) AK3.02 Actions contained in abnormal operating procedure for voltage and grid disturbances	Tier	1
	Group #	1
	K/A	700000 AK3.02
	Rating	3.6
	Revision	1
Revision Statement: Cleaned up the distractors with grammatical changes for clarity.		

Question: 58

Based on communication between Pine Bluff, Beaumont and the Main Control Room it has been determined that grid voltage cannot be maintained above 97.5% of normal voltage.

The SOC/TCC-S has indicated that Fancy Point is NOT sufficiently stable

In accordance with AOP-0064, DEGRADED GRID, which of the following describes the actions the crew should take and the reason for the action?

- A. ALL diesels should be given a normal start and paralleled to their respective buses, and then the buses should remain connected to the grid to aid in stabilization of the grid.
- B. ALL diesels should be given an Emergency start signal and paralleled to their respective buses. The buses should then be disconnected from the grid to provide stability for the buses.
- C. ALL diesels should be given a normal start, then remain running unloaded so that they are available to supply their respective buses if an undervoltage signal occurs.
- D. ALL diesels should be given an Emergency start, and then the normal bus supply breakers should be opened to allow the diesels to automatically tie to their respective buses to provide bus stability and remain disconnected from areas of instability.

Answer: D

Explanation:

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<p>D, Correct – AOP-0064 IF SOC/TCC-S OR plant indications indicate that the Fancy Point is NOT sufficiently stable OR it has been determined that a single failed phase event has occurred, THEN: Emergency Start each diesel generator and open the divisional buses supply breakers.</p>		
<p>Distracters: A. If stable, the bus is separated from the grid after the diesel is tied to the bus. B. If the grid is not stable, the diesel is not parallel. C. The diesel will not remain unloaded. See D.</p>		
<p>K/A Match The applicant must knowledge of the actions taken during a degraded grid transient</p>		
<p>Technical References: AOP-0064</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-OPS-AOP0064 Obj 3 Given AOP-0064 and key plant parameters, determine the appropriate operator response. (3)</p>		
Question Source:	Bank # 2012 Audit #20	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41.b.10	
Level of Difficulty:	4	
<p>SRO Only Justification: N/A</p>		
<p>PRA Applicability:</p>		

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Examination Outline Cross Reference	Level	RO
295002 (APE 2) Loss of Main Condenser Vacuum Knowledge of the interrelations between LOSS OF MAIN CONDENSER VACUUM and the following: (CFR: 41.7 / 45.8) AK2.07 Offgas system	Tier	1
	Group #	2
	K/A	295002 AK2.07
	Rating	3.1
	Revision	1
Revision Statement: Rewrote the stem and made the question a 2x2 type to eliminate distractor C		

Question: 59

The plant is operating at 100 % power.

Both Offgas Post Treatment Radiation monitors have alarmed on a High-High-High Radiation signal.

The Offgas System will respond by __ (1) __, and Main Condenser Vacuum will __ (2) __.

(1)

(2)

- | | |
|---|-----------------|
| A. shifting into treat mode | lower |
| B. shifting into treat mode | remain the same |
| C. isolating flow to the Main Plant Stack | lower |
| D. isolating flow to the Main Plant Stack | remain the same |

Answer: C

Explanation:

If RMS-RE23A & B see High-High-High Radiation level/INOP OR Downscale conditions, or any combination of these on the two monitors, a signal is generated to isolate the Offgas process flow by automatically closing N64-F060 isolating flow to the Main Plant Stack. The loss of Offgas would cause Main Condenser Vacuum to lower.

Distracters:

- A.** Upon receipt of Offgas High (SINGLE HIGH) Radiation levels on one monitor, a signal is generated to shift the Offgas process from the BYPASS Mode to the TREAT Mode. Main Condenser Vacuum would remain the same.
- B.** Upon receipt of Offgas High (SINGLE HIGH) Radiation levels on one monitor, a signal is generated to shift the Offgas process from the BYPASS Mode to the TREAT

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<p>Mode. Main Condenser Vacuum would remain the same D. Offgas system response to High-High-High Radiation level would isolate flow to the Main Plant Stack, but Main Condenser Vacuum would lower.</p>		
<p>K/A Match The applicant must have knowledge of how the Offgas system impacts Main Condenser vacuum.</p>		
<p>Technical References: R-STM-0606</p>		
<p>Handouts to be provided to the Applicants during exam: NONE</p>		
<p>Learning Objective: RLP-STM-0606 Obj.13 Given a set of plant conditions, predict the effect that a loss or malfunction of the Offgas System will have on the following: Condenser vacuum</p>		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	X
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41.b.7	
Level of Difficulty:	3	
<p>SRO Only Justification: N/A</p>		
<p>PRA Applicability:</p>		

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Examination Outline Cross Reference	Level	RO
295010 (APE 10) High Drywell Pressure Knowledge of the operational implications of the following concepts as they apply to HIGH DRYWELL PRESSURE: (CFR: 41.8 to 41.10) AK1.03 Temperature increases	Tier	1
	Group #	2
	K/A	295010 AK1.03
	Rating	3.2
	Revision	1
Revision Statement: Swapped distractors C and D		

Question: 60

A LOCA has resulted in the following conditions:

- Drywell temperature 225°F
- Drywell pressure 2.2 psid

Which of the following describes the status of the drywell ventilation system?

- A. Drywell cooling is NOT in service, but can be restored.
- B. Drywell cooling is NOT in service, and can NOT be restored.
- C. Drywell cooling is in service, and may remain in service.
- D. Drywell cooling is in service, Service Water should be isolated to the drywell.

Answer: B

Explanation:

Per R-STM-403, The following signals trip supply breakers for DRS-UC1A/B/C/D/E/F: · Div. 1(2) LOCA signal · RPV Level 2, -43”·OR High Drywell Pressure, 1.68 psid This trip signal can normally be bypassed using EOP-0005, Enclosure 20 – Defeating Drywell Cooling Isolation Interlocks, when the isolation signal is cleared and reset or the DW CLG ISOL INTLK BYP switches on H13-P851 and P852 are placed in BYPASS, the breakers can be reset and closed via control switches on Main Control Room Panel H13-P877. The drywell cooling service water isolation valves, SWP-MOV 4A/B, 5A/B, receive this same isolation signal that is also bypassed with these same bypass switches.

Per EOP Enclosure 20, CAUTION Restoration of Service Water to Drywell unit coolers following isolation, if any drywell temperature on CMS-TR41A or B is or has been greater than 200°F, can result in piping failure due to voiding and subsequent water

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hammer. Drywell UC Supply and Return Valves should NOT be reopened if any drywell temperature on CMS-TR41A or B is or has been greater than 200°F.

Distracters:

A. Plausible if applicant understands drywell cooling is not in service due to drywell pressure, but misunderstands the caution in Enclosure 20.

C. Plausible if applicant does not properly remember the trip signal for the breakers and the isolation signal for the Normal Service water valves for drywell unit coolers.

D. Plausible if applicant does not properly remember the isolation signal and based on no isolation drywell cooling maintains in service.

K/A Match

The applicant must understand the operational implications of the high drywell pressure and high drywell temperature.

Technical References:

R-STM-0403; Reactor Building HVAC
EOP Enclosure 20, DEFEATING DRYWELL COOLING ISOLATION INTERLOCKS

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-STM-0403-LO Objective:

Given a set of conditions and a drawing of the controls, instrumentation and/or alarms located in the Main Control Room, identify the status of the Reactor Building HVAC System by evaluation of the control/instrumentation/alarms. (10)

List the signals, including setpoints, that will trip the following fans: (5)

1. Annulus Pressure Control Fans
2. Containment Unit Coolers
3. Drywell Unit Coolers

Describe the interrelationship between the following systems and the Reactor Building HVAC System: (11)

1. Normal/Standby Service Water

Question Source:	Bank # 2010 NRC #23	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive /	X

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	Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295012 (APE 12) High Drywell Temperature Ability to operate and/or monitor the following as they apply to HIGH DRYWELL TEMPERATURE: (CFR: 41.7 / 45.6) AA1.02 Drywell cooling system	Tier	1
	Group #	2
	K/A	295012 AA1.02
	Rating	3.8
	Revision	0
Revision Statement:		

Question: 61

Following a scram due to high Drywell pressure, EOP-2 was entered with Drywell temperature rising.

Enclosure 20, Defeating Drywell Cooling Isolation Interlocks, was installed.

- (1) How many drywell unit coolers should be started?
- (2) When DW CLG ISOL INTLTK BYP switches are placed in EMERGENCY, what is bypassed?

- | | |
|------------------|--|
| (1) | (2) |
| A. 2 | Service water isolation valves interlocks ONLY |
| B. 2 | Service water isolation valves interlocks and Unit Cooler power supply trips |
| C. All available | Service water isolation valves interlocks ONLY |
| D. All available | Service water isolation valves interlocks and Unit Cooler power supply trips |

Answer: D
Explanation: Per EOP-2, when DW temperature cannot be maintained below 145F (entry condition) operate ALL available DW cooling. Per Enclosure 20, DEFEATING DRYWELL COOLING ISOLATION INTERLOCKS, the purpose is to provide instructions for defeating the Drywell Unit Coolers service water supply AND return isolation valves, low RPV water level AND high Drywell pressure isolation interlocks. Also, to supply instructions for defeating the Drywell Unit Coolers power supplies breaker trips on low RPV water level AND high Drywell pressure.

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Distracters:		
(1) 2 is plausible because Enclosure 20 states Service Water should only be aligned and Drywell Unit Coolers started if a minimum of two (2) units can run. More than two drywell unit coolers are normally operating, so if more than two are available, they need to be started.		
(2) Service water isolation valve ONLY is plausible because most isolation signals only affect valves and dampers, this is different that it bypasses breaker trips as well.		
K/A Match		
Based on the high drywell temperature, the applicant must understand the operation of drywell cooling during the high temperature event and the restoration of system as temperature is restored.		
Technical References:		
R-STM-0409; Auxiliary Building HVAC EOP Enclosure 20, DEFEATING DRYWELL COOLING ISOLATION INTERLOCKS		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-STM-0409-LO Objective: Explain how the Auxiliary Building HVAC System will respond during normal/abnormal plant and system conditions (6)		
Question Source:	Bank	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(7)	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295013 (APE 13) High Suppression Pool Temperature Ability to operate and/or monitor the following as they apply to HIGH SUPPRESSION POOL TEMPERATURE: (CFR: 41.7 / 45.6) AA1.01 Suppression pool cooling	Tier	1
	Group #	2
	K/A	295013 AA1.01
	Rating	3.9
	Revision	0
Revision Statement:		

Question: 62

RHR A was operating in Suppression Pool Cooling Mode following a full MSIV closure scram.

A small leak in the Drywell resulted in 1.68 psig and RHR A automatically re-aligned to LPCI Mode with no operator action.

Five minutes later the following conditions exist:

- RPV Pressure is being maintained 800 and 950 psig with SRVs
- RPV level is being maintained 10 to 51 inches with Feedwater
- Suppression Pool temperature has reached 102°F.

The CRS has directed the UO to re-establish Suppression Pool Cooling with RHR A as soon as possible.

When realigning RHR A back in Suppression Pool Cooling Mode..

What is the earliest time E12-F024A, Test Return to Suppression Pool Valve, be opened and E12-F048A, Heat Exchanger Bypass Valve, be closed?

- | | |
|-----------------|--------------|
| E12-F024A | E12-F048 |
| A. Immediately | In 5 minutes |
| B. Immediately | Immediately |
| C. In 5 minutes | In 5 minutes |
| D. In 5 minutes | Immediately |

Answer: A
Explanation:

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Per R-STM-0204, RESIDUAL HEAT REMOVAL SYSTEM (RHR), Ten minutes after the initiation signal is received, the open signal to the heat exchanger bypass valves MOVF048A(B) is removed, allowing them to be throttled back or closed as required. MOVF024A (B) can be manually overridden open to allow placing an RHR loop into suppression pool cooling even though an initiation signal is present (MOVF024 goes closed automatically upon an initiation signal).

Based on the given conditions, 5 minutes ago the 1.68 psid Drywell pressure provided the initiation signal. The E12-F024A can be immediately opened to provide some cooling to the suppression pool. In 5 minutes, E12-MOVF048A can be closed to maximize suppression pool cooling.

CORRECT (Immediately, in 5 minutes). MOV F024A can be immediately manually overridden open to allow placing an RHR loop into suppression pool cooling even though an initiation signal is still present. MOV F048A may be closed in 5 minutes

Distractors:

B. Distractor 1 (Immediately, immediately) is INCORRECT, but plausible. The first part is right, but the second part is wrong. Based on the given conditions, the high Drywell pressure provided the initiation signal 5 minutes ago. Per R-STM-0204, MOV F048A may be opened 10 minutes after the initiation signal is received; so the valve may be closed in 5 minutes.

C. Distractor 2 (In 5 minutes, in 5 minutes) is INCORRECT, but plausible. MOV F024 A may be opened even with initiation signal still present. The second part is right.

D. Distractor 3 (In 5 minutes, immediately) is INCORRECT, but plausible. This is opposite of the correct answer.

K/A Match

Given the plant conditions, the applicant must know the interlocks associated with the RHR suppression pool cooling system in order to determine when and how the system will need to be operated to properly align suppression pool cooling.

Technical References:

R-STM-0204, RESIDUAL HEAT REMOVAL SYSTEM (RHR)

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-STM-02014-LO, Objectives:

Describe the flow paths of the Residual Heat Removal System in the following modes of operation (2)

Suppression Pool Cooling

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List the signals, including setpoints and logic requirements, that will automatically initiate the Residual Heat Removal System (4)

List the automatic functions and interlocks of the following Residual Heat Removal System components (6)

RHR Pumps A/B/C (E12-C002A/C002B/C002C)

RHR Shutdown Cooling Isolation Valves (E12-MOVF008/9)

RHR Pump Suppression Pool Suction Valves (E12-MOVF004A/F004B/F105)

RHR Pump A/B Shutdown Cooling Suction Valves (E12-MOVF008/9)

RHR Pump Minimum Flow Valves (E12-MOVF064A/F064B/F021)

RHR Heat Exchanger Bypass Valves (E12-F048A/F048B)

RHR Suppression Pool Test Return Valves (E12-MOVF024A/F024B/F021)

LPCI Injection Valves (E12-MOVF042A/F042B/F042C)

RHR Outboard Isolation Valves (E12-MOVF027A/F027B)

RHR Shutdown Cooling Valves (E12-MOVF053A/F053B)

Question Source:	Bank #	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(8)	
Level of Difficulty:	4	
SRO Only Justification:	N/A	
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295029 (EPE 6) High Suppression Pool Water Level Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL WATER LEVEL: (CFR: 41.5 / 45.6) EK3.01 Emergency depressurization	Tier	1
	Group #	2
	K/A	295029 EK3.01
	Rating	3.5
	Revision	0
Revision Statement:		

Question: 63

Per EOP-2, Primary Containment Control, Step SPL-8, emergency depressurization is required for high suppression pool level when suppression pool level and RPV pressure cannot be restored and maintained below the ___(1)___.

The reason for Emergency Depressurization is to ___(2)___.

NOTE: PSP is Pressure Suppression Pressure and STPLL is SRV Tailpipe Level Limit

- | | |
|----------|---|
| (1) | (2) |
| A. PSP | prevent exceeding the suppression pool boundary design load if SRVs are opened. |
| B. PSP | prevent exceeding the code allowable stresses in the SRV discharge lines |
| C. STPLL | prevent exceeding the suppression pool boundary design load if SRVs are opened. |
| D. STPLL | prevent exceeding the code allowable stresses in the SRV discharge lines |

Answer: D

Explanation:

Per EOP-2, Step SPL-8, When SP level and RPV pressure cannot be restored and maintained below the STPLL (Fig 3) Emergency Depressurization is required.

Per EPSTG*0002, The SRV Tail Pipe Level Limit (STPLL) is the lesser of:

- The Maximum Pressure Suppression Primary Containment Water Level.
- The highest suppression pool level at which opening an SRV will not result in exceeding the code allowable stresses in the SRV tail pipe, tail pipe supports,

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quencher, or quencher supports. SRV operation with suppression pool water level above the STPLL could damage the SRV discharge lines.		
Distracters:		
Per EOP-2, Step CP-6, when CTMT pressure cannot be restored and maintained below the PSP (Fig 4) Emergency Depressurization is required.		
Per EPSTG*0002, The Pressure Suppression Pressure (PSP) is the lesser of: The highest containment pressure which can be maintained without exceeding the suppression pool boundary design load if SRVs are opened.		
K/A Match		
The applicant must know the reason for the emergency depressurization for high suppression pool level and what EOP curve drives the emergency depressurization.		
Technical References:		
EOP-2, Primary Containment Control EPSTG*0002		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-LO-0514, Objective 5. Given an EOP step identify the basis for the action taken.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)(10)	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
295033 High Secondary Containment Area Radiation Levels 2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)	Tier	1
	Group #	2
	K/A	295033 2.1.7
	Rating	4.4
	Revision	1
Revision Statement: Rev 1 Included RCIC steam supply drain pot valves have failed open as a distractor and changed steam leak to gland seal failure.		

Question: 64

The plant is operating at 100% power when an abnormal condition occurs while the RCIC system is in operation.

Based on the control panel indications below:



What abnormal event is occurring?

- A. RCIC pump seal leak

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- B. RCIC Gland Seal Compressor failure
- C. RCIC suction line relief valve is leaking
- D. RCIC steam supply drain pot valves have failed open

Answer: B
Explanation: Per R-STM-0514, PLANT COMPUTER SYSTEMS, the color indications are as follows: White – used for labels, structural features, axes, etc. Alpha-numeric data shown on displays is shown in white. When used for system status, white indicates that the system is operating with insufficient flow. Green – indicates safe or normal conditions. Red – Universally associated with danger, this color indicates that an unsafe condition exists, immediate action is required, or a critical parameter value is outside of permissible limits. Magenta – In all cases, this color is used to indicate bad data Given the indications provided, RCIC Equip Room and Exhaust Stack both contain red values. This indicates a problem in the RCIC Equip Room and it is discharging to the exhaust stack. Only the steam leak in the RCIC room can cause high radiation levels in the RCIC Equip Room and the Exhaust Stack. A failure of the gland seal compressor while operating will cause steam leak in the RCIC Equip Room.
Distracters: A. RCIC pump seal leak would cause CST or Suppression Pool water to enter the RCIC room. It may be potentially contaminated, but would go airbourne to cause an area radiation monitor to alarm. C. RCIC suction relief valve would pass CST or suppression pool water to the equipment drain sump and not go airbourne. D. RCIC steam drain pot valves failing open would emit steam directly to Main Condenser not the RCIC room.
K/A Match The applicant must be able to evaluate the secondary containment area radiation levels and determine the high radiation levels. Based on those conditions make operational judgement to determine the abnormal event that caused the plant response based on location and failure.
Technical References: R-STM-0514, PLANT COMPUTER SYSTEMS R-STM-0209, Reactor Core Isolation Cooling (RCIC)
Handouts to be provided to the Applicants during exam:

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None		
Learning Objective: Per RLP-STM-0514-LO, Plant Process Computers State the purpose of each color codes used by ERIS and PPC & ONE. (3) Per R-STM-0209, Reactor Core Isolation Cooling (RCIC) Given a set of conditions and drawing of the controls, instrumentation, and/or alarms located in the Main Control Room, identify the status of the RCIC System by evaluation of the controls/instrumentation/alarms. (11)		
Question Source:	Bank # 2018 NRC #63	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(11)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

ORIGINAL QUESTION:

2018 NRC Question: 63

The plant is operating at 100% power when an abnormal condition occurs.

Based on the control panel indications below:

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What abnormal event has occurred?

- A. Steam leak in the RCIC room
- B. Suction line leak in the RCIC room
- C. RCIC oil cooler water leak
- D. RCIC pump seal leak

Answer A

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Examination Outline Cross Reference	Level	RO
295036 (EPE 13) Secondary Containment High Sump/Area Water Level Knowledge of the interrelations between SECONDARY CONTAINMENT HIGH SUMP/AREA WATER LEVEL and the following: (CFR: 41.7 / 45.8) EK2.01 Secondary containment equipment and floor drain system	Tier	1
	Group #	2
	K/A	295036 EK2.01
	Rating	3.1
	Revision	1
Revision Statement: Fixed the editorial error in the stem. HPSC to HPCS		

Question: 65

HPCS automatically initiated on low reactor water level.

A rupture upstream of the HPCS pump has caused the AUX BLDG FL DRAIN SUMP LEVEL EXTREME HIGH/LOW, H13-P870/51A/G03, to alarm.

The HPCS room sump pumps will start ___(1)___.

An isolation signal ___(2)___ need to be reset to remove water from the HPCS room.

- | | |
|------------------|----------|
| (1) | (2) |
| A. automatically | will |
| B. automatically | will not |
| C. manually ONLY | will |
| D. manually ONLY | will not |

Answer: B

Explanation:

Per AUX BLDG FL DRAIN SUMP LEVEL EXTREME HIGH/LOW, H13-P870/51A/G03, 1. The following pumps will trip off or come on: DFR-TK3F P3F, P3M (HPCS) IF alarm is due to high level, THEN verify associated sump pumps of the affected sump are running AND attempt to start if not running.

Per AOP-3, Automatic Isolations, the DFR-AOV101 (DRYWELL INBD ISOL) and DFR-AOV102 (CONTMT-FIRST-OUTBD) both isolate on Group 1 signals Level 2 Reactor Water Level and 1.68 psid high drywell pressure. These two isolation valves will not need to be opened to remove water from the HPCS room. The HPCS room is located outside of the drywell and containment.

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Distracters:		
(1) Manual operation is plausible if applicant confuses controls for floor drain sump pumps.		
(2) If the applicant confuses the isolation valves and locations, it is plausible to need the isolation signal reset to re-open the isolation valves to transfer water from the HPCS room.		
K/A Match		
The applicant must have knowledge of the relationship between a high HPCS sump level and the system response. The applicant must understand the response of the pump and the effect of an isolation signal on the system response.		
Technical References:		
AUX BLDG FL DRAIN SUMP LEVEL EXTREME HIGH/LOW, H13-P870/51A/G03		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-STM-0609-LO, Floor and Equipment Drain System, Objective: Describe the operation/draw a simplified flow path of the Floor and Equipment Drains System, including the following: (2) Containment/Drywell Floor and Equipment Drain subsystems (DFR/DER) Auxiliary Building Floor Drain subsystem (DFR) Describe the purpose, construction, and operation of the following: (3) Sumps Sump Pumps Mechanical Alternators Containment/Drywell Floor and Equipment Drain subsystems (DFR/DER) DFR-AOV101, RB Floor Drain Inboard Isolation DFR-AOV102, RB Floor Drain Outboard Isolation		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(7)	
Level of Difficulty:	4	

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SRO Only Justification: N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
Ability to make accurate, clear, and concise logs, records, status boards, and reports. (CFR: 41.10 / 45.12 / 45.13)	Tier	3
	Group #	1
	K/A	2.1.18
	Rating	3.6
	Revision	1
Revision Statement: Reordered the distractors making D the correct answer		

Question: 66

Which of the following events would require BOTH a Narrative Log entry and a Condition Report?

- A. Planned Mode changes
- B. Surveillance and periodic test start and stop times
- C. Installation and removal of Temporary Modifications
- D. Abnormal plant condition that cannot be readily explained

Answer: D.

Explanation:

Per EN-LI-102, Corrective Action Program, Attachment 1, Condition Report Classification Guidance, Category B, C and D (Adverse Conditions), Category B CRs are investigated with analysis methods selected by management to sufficiently understand the issue to develop actions to improve future performance. Category C CRs use an action to correct the identified condition. Category D CRs are administratively closed at screening.
Attachment 1, Condition Report Classification Guidance, Category A #29. Abnormal plant conditions or indications that cannot be readily explained or long-term, unexplained plant conditions [SOER 2-04 Rec 3]

Distractors:

All distractor are included in EN-OP-115-09, Maintaining the Station Narrative Log, 5.0 Instructions. 5.1 Log keeping. 1. ensure Operations Station Narrative logs contain a chronological listing of events relevant to unit operation occurring on a given shift, including:
Surveillance and periodic test start and stop times
Installation and removal of Temporary Modifications
Mode changes

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K/A Match		
Applicant must know what is required to be put into the narrative logs and write a condition report.		
Technical References:		
EN-OP-115-09, Maintaining the Station Narrative Log		
EN-LI-102, Corrective Action Program		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-OPS_HLO208-LO, Corrective Action Program, Objective:		
4. Describe when it is appropriate to write a condition report.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)(10)	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)	Tier	3
	Group #	1
	K/A	2.1.30
	Rating	4.4
	Revision	2
Revision Statement:		
Rev 1 Rewrote the question to meet the K/A better.		
Rev 2 Added ONLY to B and C. Replaced and with AND in B, C, and D.		

Question: 67

Following an event requiring evacuation of the Main Control Room, List ALL of the area(s) of the plant that contain local controls for safety related equipment?

- A. Control Building ONLY
- B. Control Building AND Auxiliary Building ONLY
- C. Control Building AND Standby Cooling Tower ONLY
- D. Control Building, Auxiliary Building, AND Standby Cooling Tower

Answer: D
Explanation: The Remote Shutdown System (RSS) simply provides a means of operation of critical plant components from areas of the plant outside the Main Control Room. Most of the controls are in the Control Building , where habitability is most closely controlled and HVAC Systems and emergency power sources are readily accessible. Other local locations including the Auxiliary Building and Standby Cooling Tower have controls located on the back Motor Control Centers(MCCs)
Distracters: All distracters are plausible due to the fact they local controls for safety related equipment. A Contains the majority of remote shutdown equipment, but not all. B. Contains remote shutdown equipment but is leaving out the Standby Cooling Tower. C. Contains remote shutdown equipment but is leaving out the Auxiliary Building.
K/A Match

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Applicant must be able to identify location of safety related equipment controls related to remote shutdown.		
Technical References: R-STM-0200, Remote Shutdown System		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: State the locations of the Division 1 and Division 2 Remote Shutdown Stations. (3)		
Question Source: (note changes and attach parent)	Question Source: (note changes and attach parent)	Question Source: (note changes and attach parent)
Question Cognitive Level:	Question Cognitive Level:	Question Cognitive Level:
10CFR Part 55 Content:	10CFR Part 55 Content:	10CFR Part 55 Content:
Level of Difficulty:	Level of Difficulty:	Level of Difficulty:
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Knowledge of the process for managing maintenance activities during shutdown operations, such as risk assessments, work prioritization, etc. (CFR: 41.10 / 43.5 / 45.13)	Tier	3
	Group #	2
	K/A	2.2.18
	Rating	2.6
	Revision	3
Revision Statement:		
Rev 1 re-worded distractors to match wording from OSP-37.		
Rev 2 Changed the stem to ask about a RED risk instead of a YELLOW risk. Reordered the distractors from smallest to biggest.		
Rev 3 removed distractor A for normal work controls and created a new distractor (new D.)		

Question: 68

During a refueling outage, the Plant Safety Risk color code is RED.

Which of the following is an attribute/requirement for this condition per OSP-37, Shutdown Operations Protection Plan?

- A. GMPO or designee approval needed prior to entry.
- B. A configuration in which Key Safety Function is not maintained.
- C. A risk mitigation contingency plan in place prior to entering this condition.
- D. A configuration in which a failure or error would potentially lead to the loss of the Key Safety Function without specific contingency plans pre-defined.

Answer: B

Explanation:

As defined in OSP-0037 definitions, RED – is considered an unacceptably high risk configuration corresponding to not meeting Tech Spec requirements. Based on the combination of available systems and activity types, this condition signifies an unacceptable increase in CDF (for those plant using a quantitative shutdown model) or a configuration in which the Key Safety Function is not maintained

Distractors:

All distractors are plausible based on definitions of other risk associated colors.

GREEN – is considered a minimal risk configuration. Based on the combination of available systems and activity types, a failure or error could be easily mitigated without presenting a significant challenge in that Key Safety Function and requires no additional approvals. Normal work controls are sufficient. Generally, this condition will signify a

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condition exceeding minimum Tech Spec requirements and a minimal change in Core Damage Frequency.

YELLOW – is considered a medium risk configuration. Based on the combination of available systems and activity types, a failure or error can still be mitigated but might present a challenge in that Key Safety Function. The risk important SSCs should be maintained available/operable. Measures should be taken to ensure that subsequent maintenance activities do not increase risk. The length of time spent in a YELLOW condition should be minimized. Generally, this condition signifies a minimum requirement for safety related equipment or a marginal increase in CDF that is deemed to be within the range of acceptable risk.

ORANGE –is considered a higher risk configuration corresponding to having to credit Tech Spec Action statements or NRC Enforcement Guidance Memoranda or similar for meeting Tech Specs.. Based on the combination of available systems and activity types, this condition signifies a significant increase in CDF (for those plant using a quantitative shutdown model) or a configuration in which a failure or error would potentially lead to the loss of the Key Safety Function without specific contingency plans pre-defined.

K/A Match

Applicant must have knowledge of the associated risk colors and operational implications of the risk associated with those colors.

Technical References:

OSP-0037

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-OPS-HLO-250-LO,
Describe the On Line Risk Assessment Process (3).

Question Source:	Bank # 2008 NRC #70	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
Level of Difficulty:	3	

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SRO Only Justification: N/A
PRA Applicability:

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Examination Outline Cross Reference	Level	RO
Knowledge of conditions and limitations in the facility license.	Tier	3
	Group #	2
	K/A	2.2.38
	Rating	3.6
	Revision	0
Revision Statement:		

Question: 69

Per LCO 2.0 Safety Limits, with the reactor steam dome pressure <685 psig or core flow <10% rated core flow, THERMAL POWER shall be ≤__(1)__ RTP.

The NRC Operations Center, shall be notified within __(2)__ of a Safety Limit violation.

- | | |
|----------|---------|
| (1) | (2) |
| A. 23.8% | 1 hour |
| B. 23.8% | 2 hours |
| C. 50% | 1 hour |
| D. 50% | 2 hours |

Answer: A

Explanation:

Technical Specifications 2.1.1.1 With the reactor steam dome pressure < 685 psig or core flow < 10% rated core flow: THERMAL POWER shall be ≤ 23.8% RTP.

TS 2.1 SL Violations, with any SL violation, the following actions shall be completed:
2.2.1 Within 1 hour, notify the NRC Operations Center, in accordance with 10CFR 50.72.

Distracters:

Per Tech Spec bases for B2.1.1 Analyses (Ref. 2) show that with a bundle flow of 28 x 103 lb/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be > 28 x 103 lb/hr. Full scale ATLAS test data taken at pressures from 14.7 psia to 700 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 MWt. With the design peaking factors, this corresponds to a THERMAL POWER > 50% of original RTP. Thus, a THERMAL POWER limit of 23.8% RTP for reactor pressure < 685 psig is

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conservative.		
Per Tech Spec 2.2 Notifications		
2.2.2 Within 2 hours:		
2.2.2.1 Restore compliance with all SLs; and		
2.2.2.2 Insert all insertable control rods.		
K/A Match		
The technical specification safety limits are defined limitations to our facility license.		
Technical References:		
Tech Spec and bases 2.1 and 2.2		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RPPT-HLO-0401 Objective:		
State the four safety limits. (2)		
Describe the bases for the four safety limits. (3-6)		
State the actions that shall be completed within two hours, if any safety limit is violated. (7)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)	Tier	3
	Group #	2
	K/A	2.2.40
	Rating	3.4
	Revision	1
Revision Statement:		
Rev 1 Reordered the distractors. Made the correct answer A		

Question: 70

A qualitative assessment of a channel's behavior during operation made by comparison of the channel indication and status to other indications or status is a _____.

- A. channel check
- B. channel functional
- C. channel calibration
- D. channel response time

Answer: A

Explanation:

As defined in TS Definitions 1.1, A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.

Distractors:

A. A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel, including the required sensor, alarm, display, and trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an in-place qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is calibrated.

B. A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY,

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including required alarm, interlock, display, and trip functions, and channel failure trips. The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps so that the entire channel is tested.

D. Reponse time is the time interval measure from when a parameter exceeds its setpoint until the actuation occurs.

K/A Match

The applicant must know the definitions that apply to systems in technical specifications. The applicant must know specific tests performed on systems to determine operability.

Technical References:

TS Definitions 1.1

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-HLO-416 Objective:

1. During all modes of plant operation, be able to use the terms defined in Technical Specifications to implement the Specifications.
3. Give a working definition of the following terms in accordance with Technical Specifications: c) Channel Check

Question Source:	Bank # Nov 2012 #70	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
Level of Difficulty:	2	
SRO Only Justification:	N/A	
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.11 / 41.12 / 43.4 / 45.9)	Tier	3
	Group #	3
	K/A	2.3.5
	Rating	2.9
	Revision	1
Revision Statement: Rev 1 Eliminated part (3) of the question.		

Question: 71

While using a handheld frisker, the user should move the frisker at a rate of about (1) inches per second approximately (2) inch(s) from the surface being surveyed.

- A. $\frac{(1)}{2}$ $\frac{(2)}{\frac{1}{2}}$
- B. 2 2-3
- C. 6 $\frac{1}{2}$
- D. 6 2-3

Answer: A
Explanation: Per FCBT-GET-RWT, (53/80) Using a Frisker, Friskers use a hand-held probe coupled with a meter that you use to check yourself for contamination. Before you pick up the probe, check to ensure the frisker is turned on, set to the X1 scale and the display is less than 200 counts per minute (cpm). Monitor your hands by passing them; one at a time, about one half inch above the frisker probe at a speed of about 2 inches per second. Monitor the front and back of each hand.
Distracters: (1) 6 inches is plausible if applicant is confused on frisker rate. (2) 2-3- inches is plausible if applicant confuses with approximate total time to complete whole body frisk. (3) X10 is plausible if applicant confuses with second setting on frisker.
K/A Match Applicant must have knowledge of requirements to perform a whole body frisk using portable frisker. The applicant must have knowledge of the settings, rate of frisk, and

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how to properly frisk.		
Technical References: EN-RP-100 GET RWT training material Slide 27 of 50		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: FCBT-GET-RWT Objective: Explain how to monitor personnel and personal items for contamination, including the use of friskers and personnel contamination monitors.		
Question Source:	Bank # Oct 2014 Audit	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	55.41(b)(10)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)	Tier	3
	Group #	3
	K/A	2.3.7
	Rating	3.5
	Revision	2
Revision Statement: Rev 1 Changed the part (2) distractors from A and C to 250. Reworded the stem to remove the subset issue Rev 2 included the word maximum in the stem and rearranged the distractors from smallest to biggest.		

Question: 72

An operator is entering a high radiation area.

According to EN-RP-100, Radiation Worker Expectations, the operator should check his Self-Reading dosimeter (SRD) every ___(1)___.

If the dose alarm is 500 mrem, the operator is expected to exit the RCA before reaching a **MAXIMUM** accumulated dose of ___(2)___ mrem.

- | | |
|---------------|-----|
| (1) | (2) |
| A. 15 minutes | 250 |
| B. 15 minutes | 400 |
| C. hour | 250 |
| D. hour | 400 |

Answer: B

Explanation:

Per EN-RP-100 Radiation Worker Expectations, Attachment 9.1 Good Rad Worker Practices:

5. Check SRD every 15 minutes in a HRA.

6. Exit RCA at 80% of SRD accumulated dose alarm.

$80\% \times 500 = 400$ mrem

Distractors:

(1) Per EN-RP-100 Radiation Worker Expectations, Attachment 9.1 Good Rad Worker

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Practices: 4. Check SRD 1 – 2 times per hour routinely (In RCA).		
(2) If applicant confuses 80% exit requirement with prior to exceeding dose alarm 500 mrem is plausible.		
K/A Match		
The applicant must have knowledge of the Radiation Worker Expectations and apply them to the given situation to meet the station expectations for the radiation worker permit requirements.		
Technical References:		
EN-RP-105, Rev 4		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
FCBT-GET-RWT, Objective: Identify the modes, methods, and frequency for operating and reading SRD. State the function of the Radiation Work Permit and the responsibility for complying with its requirements.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(12)	
Level of Difficulty:	2	
SRO Only Justification:		
N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Knowledge of the operational implications of EOP warnings, cautions, and notes.	Tier	3
	Group #	4
	K/A	2.4.20
	Rating	3.8
	Revision	1
Revision Statement: Rev 1 Swapped distractors A and B, making B the correct answer..		

Question: 73

Per OSP-9, Author's Guide/Control and Use of Emergency Operating and Severe Accident Procedures, Emergency Operating Procedure (EOP) _____ provide additional information to the operator regarding potential hazards to equipment or personnel.

- A. notes
- B. cautions
- C. overrides
- D. warnings

Answer: B
Explanation: Per OSP-9, 4.4.13. Cautions 1. Cautions provide additional information to the operator regarding potential hazards to equipment or personnel. A caution should not be used to direct operators to perform actions.
Distractors: A. Per RBS Writers Guide, 7.12, Note statements are used to provide additional information deemed beneficial to the procedure user. C. Per OSP-9, 4.4.4 Override Steps contain one or more conditions with associated actions that take precedence over the flow path steps to which they apply. D. Per RBS Writers Guide, 7.10, Warning statements are used to alert procedure users to potential personnel hazards. EOPs do not contain warning statements.
K/A Match Applicant must have knowledge of the procedure that defines terms used in EOPs and the operational implications associated with each term.

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Technical References: OSP-9, AUTHOR'S GUIDE/CONTROL AND USE OF EMERGENCY OPERATING AND SEVERE ACCIDENT PROCEDURES RBS Writers Guide		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: RLP-OPS-HLO-218-LO, Objective: Define each of the following terms and describe the figures as used in the EOP/SAP flow charts. (1) l) Cautions		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	41(b)(10)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	RO
Knowledge of "fire in the plant" procedures. (CFR: 41.10 / 43.5 / 45.13)	Tier	3
	Group #	4
	K/A	2.4.27
	Rating	3.4
	Revision	1
Revision Statement: Rev 1 Added a procedure number to the answer		

Question: 74

What procedure provides an area map and a list of combustibles, electrical, flammables, radiological and toxic hazards identified for a fire in an area that contains safety related equipment?

- A. CB-098-118, PRE-FIRE STRATEGY
- B. AOP-31, SHUTDOWN FROM OUTSIDE THE MAIN CONTROL ROOM
- C. SEP-FPP-RBS-002, RIVER BEND STATION FIRE FIGHTING PROCEDURE
- D. AOP-52, FIRE OUTSIDE THE MAIN CONTROL ROOM IN AREAS CONTAINING SAFETY RELATED EQUIPMENT

Answer: A
Explanation: The Pre-Fire Strategies include location, access, hazards, guidelines for fire attack, fire protection equipment and drainage, ventilation, communications, wall receptacles, and evaluation of fire and safe shutdown capability.
Distracters: B. Plausible if applicant confuses with a fire that requires the evacuation of the Main Control Room. Per AOP-31, the purpose is to provide instructions for the safe shutdown and cooldown of the Reactor following an event requiring evacuation of the Main Control Room (MCR). C. This is plausible because this procedure establishes the actions to be taken by River Bend Station personnel in the event of a fire. This procedure is applicable to all personnel in all fire situations. Per 5.4 Actions by OSM/CRS 5.4.1.3 If plant shutdown is required, then refer to AOP-52 to determine safe shutdown equipment available for a fire in a specific location.

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D. This is plausible because AOP-52, is used to inform the Operators which systems and equipment are analyzed to be available for safely shutting down and cooling down the Reactor following a fire located outside the Main Control Room in any area containing safety related equipment.

K/A Match

The applicant must have knowledge of what is contained in each “fire in the plant” procedure to select the procedure that contains specific hazards identified for a given area.

Technical References:

PRE-FIRE STRATEGIES
 AOP-31, SHUTDOWN FROM OUTSIDE THE MAIN CONTROL ROOM
 SEP-FPP-RBS-002, RIVER BEND STATION FIRE FIGHTING PROCEDURE
 AOP-52, FIRE OUTSIDE THE MAIN CONTROL ROOM IN AREAS CONTAINING SAFETY RELATED EQUIPMENT

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-HLO-544 AOP-052,
 Describe the purpose of AOP-0052, Fire Outside the Main Control Room in Areas Containing Safety Related Equipment.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	

10CFR Part 55 Content:	41(b)(10)	
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Level of Difficulty:	3	
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SRO Only Justification:

N/A

PRA Applicability:

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Examination Outline Cross Reference	Level	RO
2.4.39 Knowledge of RO responsibilities in emergency plan implementation.	Tier	3
	Group #	N/A
	K/A	2.4.39
	Rating	3.9
	Revision	0
Revision Statement:		

Question: 75

A General Emergency was declared at 0100.

The State and Local authorities were notified at 0120.

The NRC was notified at 0130.

Who was notified in the required time requirements?

- A. NRC ONLY
- B. State and Local authorities ONLY
- C. NRC, State, and Local authorities
- D. None were notified in the required time.

Answer: A

Explanation:

Per EIP-2-006, Notifications:

Notification must be made to State and local authorities within approximately 15 minutes.

As directed by the ED, notify the NRC of the emergency using ENS after notifying the State and local authorities and no later than one hour after the declaration of the Emergency.

Distracters:

All combinations are plausible if applicant confuses notification requirements for State/Local authorities and NRC.

K/A Match

Reactor operators qualify communicator as part of their ERO qualifications. The communicator when directed relays information concerning station status to offsite agencies. The communicator should also know the time requirements to notify offsite

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agencies.		
Technical References: EIP-2-006, Notifications		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: RCBT-EP-SRORMED, Objective a. Identify the requirements and process for classifying an emergency. (15) j. State the conditions and time limit to classify an event. (6)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(10)	
Level of Difficulty:	3	
SRO Only Justification: N/A		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
215005 (SF7 PRMS) Average Power Range Monitor/Local Power Range Monitor 2.2.38 Knowledge of conditions and limitations in the facility license.	Tier	2
	Group #	1
	K/A	215005 2.2.38
	Rating	4.5
	Revision	3
Revision Statement:		
Swapped K/A, due to original K/A not on ES-401 D.1.b. list of Generic K/As. Selected 2.2.38 to get question from 10CFR55.43(b)(1) in order to diversify 43(b) content on examination.		
Rev 1: Changed question for actual power limit and time period required before reporting violation.		
Rev 2: Changed question for Single Loop power restrictions to minimize possibility of two answers.		
Rev 3: Changed part (2) to match KA better.		

Question: 76

Per Tech Specs during SINGLE LOOP operation, reactor power is limited to ___(1)___ megawatts thermal.

During single loop operation, modification to the Reactor Protection System average power range monitor (APRM) instrument setpoints is required to account for the changes in Average Power Range Monitor Neutron ___(2)___.

- | | | | |
|----|------|--|--|
| | (1) | (2) | |
| A. | 2400 | Flow Biased Simulated Thermal Power - High | |
| B. | 2400 | Flux – High, Setdown | |
| C. | 3039 | Flow Biased Simulated Thermal Power - High | |
| D. | 3039 | Flux – High, Setdown | |

Answer: A

Explanation:

Per Tech Spec 3.4.1 Recirculation Loops Operating, One recirculation shall be in operation with THERMAL POWER $\leq 77.6\%$.

Per GOP-5, Power Maneuvering, the core thermal power limits shall be adhered to at all times, single-loop operation at 2400 MWth (77.6% Instantaneous).

Per LCO 3.4.1 Recirculation Loops Operating Bases, Applicable Safety Analyses,

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during single recirculation loop operation, modification to the Reactor Protection System average power range monitor (APRM) instrument setpoints is also required to account for the different relationships between recirculation drive flow and reactor core flow. The APLHGR and MCPR limits for single loop operation are specified in the COLR. The APRM flow biased simulated thermal power setpoint is in LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation."

Distracters:

- (1) Per the RBS USAR, A core thermal power of at least 3039 MW is used for evaluating radiological consequences of design basis accidents.
- (2) The Neutron Flux – High, Setdown function of APRM is plausible because of its application at low power and low flow. If applicant confuses this function with the flow biased simulated thermal power function. Per TS B 3.3.1.1 Applicable Safety Analyses, LCO, and Applicability 2a, No specific safety analyses take direct credit for the Average Power Range Monitor Neutron Flux-High, Setdown Function. However, this Function indirectly ensures that, before the reactor mode switch is placed in the run position, reactor power does not exceed 23.8% RTP (SL 2.1.1.1) when operating at low reactor pressure and low core flow. Therefore, it indirectly prevents fuel damage during significant reactivity increases with THERMAL POWER < 23.8% RTP.

K/A Match

Applicant must have knowledge of the power limitation in the facility license. The applicant must also know the conditions required to meet the licensed power limit and the APRM function that is adjusted to provide protection from violating the facility license limits.

Technical References:

- Tech Spec 3.4.1, Recirculation Loops Operating
- Tech Spec 3.4.1, Recirculation Loops Operating Bases
- Tech Spec 3.3.1.1, RPS Instrumentation Bases
- GOP-5, Power Maneuvering
- RBS USAR

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-STM-0503-LO, Explain the condition(s) that could lead to inaccurate power level indication including the actions to be taken by the operator to determine the validity of power level indication. (29)

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X

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Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(1)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must know the reporting requirements of when the maximum thermal power output is exceeded. Also the applicant must know from Tech Spec Bases, why the APRM setpoints are adjusted and what protection is applied.		
PRA Applicability:		
Reactor Protection system, RPS is #4 Risk Significant System.		

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Examination Outline Cross Reference	Level	SRO
217000 Reactor Core Isolation Cooling System (RCIC) A2. Ability to (a) predict the impacts of the following on the REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.03 Valve closures	Tier	2
	Group #	1
	K/A	21700 A2.03
	Rating	3.3
	Revision	1
Revision Statement: Updated explanation to better explain why the reasoning for the correct answer		

Question: 77

The Reactor Core Isolation Cooling System (RCIC) was manually started in accordance with SOP-0035, REACTOR CORE ISOLATION COOLING SYSTEM.

After 5 minutes of full flow operation, the following indications were observed:



Based on these indications, RCIC has tripped due to a ___(1)___ and can be restored to OPERABLE status using ___(2)___ once the isolation signal is cleared.

(1)

(2)

A. DIV 1 isolation signal

SOP-0035,RCIC SYSTEM

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- B. DIV 1 isolation signal AOP-0003,AUTOMATIC ISOLATIONS
- C. DIV 2 isolation signal SOP-0035, RCIC SYSTEM
- D. DIV 2 isolation signal AOP-0003, AUTOMATIC ISOLATIONS

Answer: C											
Explanation:											
<p>The inboard isolation valves close on a DIV 2 isolation signal which in turn will provide a RCIC turbine trip signal. The picture shows E51-F076 and E51-F063(inboard valves) closed and E51-F064(outboard valve) open which indicates a DIV 2 isolation signal only. SOP-0035 gives the guidance to reset the isolation and trip signals returning the RCIC system back to OPERABLE status.</p>											
Distracters:											
<p>A and B. DIV 1 isolation signal will cause a RCIC turbine trip however the picture indicates that didn't occur do to E51-F064 being open.</p> <p>B and D DIV 2 isolation signal did occur however AOP-0003 is not the correct procedure to return the RCIC system to OPERABLE status. AOP-0003(section 5.10) is used to reset BOP/MSIV isolations, but not a RCIC isolation.</p>											
K/A Match											
<p>Must have the knowledge of which valves are DIV 1 or DIV 2 and isolation signals for these valves also provide a turbine trip signal. Knowledge of the content contain in the procedures to restore the system back to OPERABLE status.</p>											
Technical References:											
<p>SOP-0035, Reactor Core Isolation Cooling AOP-0003, Automatic Isolations</p>											
Handouts to be provided to the Applicants during exam:											
<p>NONE</p>											
Learning Objective:											
<p>RLP-STM-0209 Objective 12. Given plant/system status and key parameters, predict/determine RCIC System response</p>											
Question Source:											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">(note changes and attach parent)</td> <td style="width: 33%;">Bank #</td> <td style="width: 33%;"></td> </tr> <tr> <td></td> <td>Modified Bank #</td> <td></td> </tr> <tr> <td></td> <td>New</td> <td style="text-align: center;">X</td> </tr> </table>			(note changes and attach parent)	Bank #			Modified Bank #			New	X
(note changes and attach parent)	Bank #										
	Modified Bank #										
	New	X									

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Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	x
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
SRO must assess plant conditions (normal, abnormal, or emergency) and then select a procedure or section of a procedure to mitigate or recover, or with which to proceed		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
218000 (SF3 ADS) Automatic Depressurization 2.2.12 Knowledge of surveillance procedures	Tier	2
	Group #	1
	K/A	218000 2.2.12
	Rating	4.1
	Revision	1
Revision Statement: Rev 1 changed distractor A to say Immediately		

Question: 78

SR 3.5.1.3, to verify ADS accumulator supply pressure is ≥ 131 psig, is required to be completed every 31 days.

SR 3.5.1.3 was last completed on October 1.

On November 1, SR 3.5.1.3 was discovered not completed.

From the time of discovery, what is the maximum amount of time left allowed to maintain ADS SRVs OPERABLE?

- A. Immediately
- B. 24 hours
- C. 7 days
- D. 38 days

Answer: C

Explanation:

$31 \text{ days} \times 1.25 = 38.75 \text{ days}$

SR 3.5.1.3 must be completed in 38 days. October 1 + 38 days = November 8

Per SR 3.0.2 SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

Distractors:

A. Plausible if applicant assumes given completion time is not met and equipment is immediately declared INOPERABLE.

B. Plausible if applicant incorrectly applies SR 3.0.3 which adds a delay period of 24

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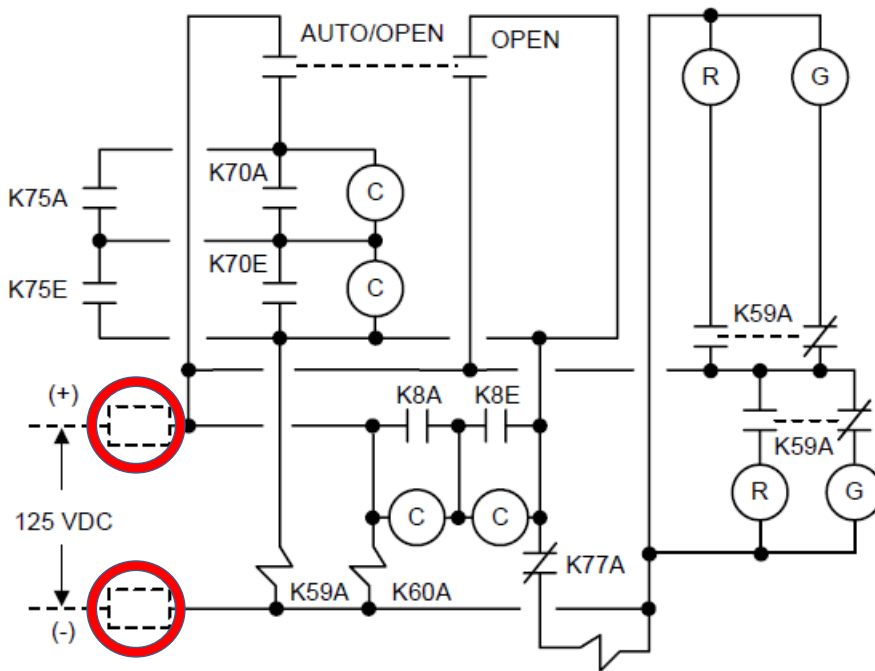
hours or up to the limit of the specified frequency, whichever is greater.		
D. Plausible if applicant calculates the extension per SR 3.0.2 and applies that to the time of discovery.		
K/A Match		
Applicant must have knowledge of SR 3.0.2 and understand how that applies to SR 3.5.1.3.		
Technical References:		
Tech Spec 3.5.1 TS 3.0		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-STM-0202-LO, ADS, Identify the ADS operability requirements of Technical Specifications. (8)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(2)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must apply the requirements per SR 3.0.2 and apply that to SR 3.5.1.3.		
PRA Applicability:		
SRV Depressurization, ADS is #3 Risk Significant System.		

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Examination Outline Cross Reference	Level	SRO
239002 Relief/Safety Valves 2.2.36 Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	Tier	2
	Group #	1
	K/A	239002 2.2.36
	Rating	4.2
	Revision	0
Revision Statement:		

Question: 79

Plant is operating in MODE 1



The DIV 1 fuses (circled in RED) and **ONLY** these fuses were removed from this SRV to support maintenance activities rendering this SRV inoperable per RBS Technical Specifications.

With the fuses removed, this SRV is FUNCTIONAL in __ (1) __. The CRS should enter Tech Spec(s) __ (2) __.

3.5.1 ECCS Operating

3.6.1.6 Low-Low(LLS) Valves

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- | | |
|---------------------|-------------------|
| (1) | (2) |
| A. All modes | 3.5.1 |
| B. All modes | 3.5.1 and 3.6.1.6 |
| C. Safety mode ONLY | 3.5.1 |
| D. Safety mode ONLY | 3.5.1 and 3.6.1.6 |

Answer: B

Explanation:

Per R-STM-1019, Main Steam, Figure 12, the figure provided is an ADS SRV Solenoid and Low Low Set Valve.

Each SRV has two divisions of solenoid power to operate the valve automatically. Removal of one set of fuses doesn't prevent automatic operation due to redundancy.

Per R-STM-1019, Main Steam, ENBPNL02A(B) – a loss of one of the 2 divisions of 125 VDC will not prevent electrical operation of the SRVs in the relief, low-low set, nor ADS mode as only one solenoid is required to be energized to open the SRV. However, if both division of 125VDC power is lost, the SRVs will not function in manual, relief, low-low set or ADS mode. The only operational method will be the Safety mode.

The stem indicates only the Division 1 fuses have been removed. This will INOP the division 1 functions of the SRV, but the SRV will still be able to function in all modes using the division 2 solenoid power.

Per Tech Spec 3.5.1 ECCS – Operating, Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of seven safety/relief valves shall be OPERABLE. Per 3.5.1 Bases, Background, the ADS consists of 7 of the 16 S/RVs. This requires all 7 of the ADS valves to be OPERABLE. Per 3.5.1 Condition E with One ADS valve inoperable. E.1 Restore ADS valve to OPERABLE status within 14 days

Distracters:

A. Plausible if applicant understands the solenoid power supplies and divisional logic requirements, but confuses the tech spec requirements. Tech Spec 3.4.4 Safety/Relief Valves (S/RVs) requires the safety function of five S/RVs shall be OPERABLE, AND The relief function of four additional S/RVs shall be OPERABLE. All SRVs have safety and relief function capability. If applicant confuses entry requirement with ADS or Low Low Set requirement, 3.4.4 would be plausible.

C. Plausible if applicant confuses power supply and logic inputs. If applicant believes only one division of power is used to operate the SRV in all modes except safety and that power supply is removed, then all other modes would become INOPERABLE. The

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applicant can also confuse the logic diagram and misinterpret only the division 1 fuses are removed. If applicant believes both divisions have been de-energized, then they would no longer function in all modes, only safety mode. Tech spec 3.4.4 is plausible, see A.

D. Plausible, see B and C.

K/A Match

The applicant must interpret the diagram and the impact of maintenance activity removing one division's fuses. The applicant must then apply the degraded power supply to the SRV and determine which modes are still functional and OPERABLE.

Technical References:

R-STM-1019, Main Steam
 Tech Spec 3.4.4
 Tech Spec 3.5.1

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-01019-LO, Objective 2, Describe the interrelationships between the following systems and the Mina Steam System. B) Electrical Distribution.

RLP-STM-01019-LO, Objective 16, Identify the Technical Specifications, Technical Requirements Manual, and/or Bass requirements for the Main Steam System.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(2)	
Level of Difficulty:	4	

SRO Only Justification:

Applicant must interpret diagram to first determine the type of SRV functions available. Then apply the degraded conditions to the functions. Based on the impact of the maintenance activity, the applicant must determine the functionality and operability per Technical Specifications.

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PRA Applicability:
SRV Depressurization, ADS is #3 Risk Significant System.

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Examination Outline Cross Reference	Level	SRO
264000 (SF6 EGE) Emergency Generators (Diesel/Jet) EDG Ability to (a) predict the impacts of the following on the EMERGENCY GENERATORS (DIESEL/JET); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.03 Operating unloaded, lightly loaded, and highly loaded	Tier	2
	Group #	1
	K/A	264000 A2.03
	Rating	3.4
	Revision	1
Revision Statement: Rev 1: Changed part (2) to make clear that it is after planned maintenance. Not after subsequent loss of offsite power.		

Question: 80

When the Diesel is operating synchronized to the grid, the diesel generator shall be declared inoperable.

This is because if a Loss Offsite Power were to occur during operations when synchronized to the grid the resultant operations with the diesel powering the Div I(II) bus will cause the diesel ___(1)___ to be outside Tech Spec limits.

(2) Per Tech Spec 3.8.1 AC Sources – Operating, what is the total maximum completion time to restore the Div I(II) standby diesel generator to OPERABLE status after planned maintenance?

- | | |
|--------------|---------|
| (1) | (2) |
| A. frequency | 14 days |
| B. frequency | 17 days |
| C. voltage | 14 days |
| D. voltage | 17 days |

Answer: A

Explanation:

Per SOP53, 2.56 When the Diesel is operating synchronized to the grid, the diesel generator shall be declared inoperable. This is because if a Loss Offsite Power were to

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occur during operations when synchronized to the grid the resultant operations with the diesel powering the Div I(II) bus will cause the diesel frequency to be outside TS 3.8.1.2 and 3.8.1.7 frequency limits.

The second Completion Time (14 days) applies to an inoperable Division I or Division II DG and is risk-informed allowed out-of-service time (AOT) based on plant specific risk analysis. The extended AOT would typically be use for voluntary planned maintenance or inspections but can also be used for corrective maintenance.

Distracters:

Voltage is probable if applicant confuses other parameter covered by TS 3.8.1 Surveillance Requirements.

Per Tech Spec Bases 3.8.1 Condition C.4 The third Completion Time for Required Action C.4 established a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition C is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This situation could lead to a total of 17 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 20 days) allowed prior to complete restoration of the LCO. The 17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and C are entered concurrently. The "AND" connector between the Completion Times means that the three Completion Times apply simultaneously, and the most restrictive Completion Time must be met.

K/A Match

The applicant must understand the impact on diesel generator loading when paralleling the diesel generator with offsite power and apply the conditions to meet the Tech Spec requirements per 3.8.1.

Technical References:

SOP-53, Standby Diesel Generator and Auxiliaries
Tech Spec 3.8.1 AC Sources – Operating

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-STM-309S-LO, Objective (7) Given SOP-0053, state the purpose for each Precaution and Limitation and discuss the steps required to perform the following evolution: Parallel an Offsite Source to Standby Diesel Generator from the Control Room

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Identify the Technical Specifications, Technical Requirements Manual, and/or Bases requirements for the Standby Diesel Generators. (12)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(2)	
Level of Difficulty:	4	
SRO Only Justification:		
The applicant must apply the given conditions and apply the knowledge from technical specification bases to determine the correct completion time.		
PRA Applicability:		
Loss of Offsite Power (LOSP) is in the top ten internal events contributing to RBS baseline core damage frequency.		

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Examination Outline Cross Reference	Level	SRO
201001 (SF1 CRDH) CRD Hydraulic 2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	Tier	2
	Group #	2
	K/A	201001 2.1.28
	Rating	4.1
	Revision	1
Revision Statement: Rev 1 Added According to Tech Spec Bases to the stem		

Question: 81

In Mode 1:

Tech Spec 3.1.5, Control Rod Scram Accumulators, actions require inserting a manual scram within 20 minutes when conditions require.

According to Tech Spec Bases, what is the basis for the allowed completion time of 20 minutes for this action?

- A. Allow time to start a CRD pump.
- B. Allow time to recharge the inoperable scram accumulators.
- C. Allow time to drain water from the inoperable scram accumulator instrument blocks.
- D. Allow time to fully insert and disarm the control rods associated with the inoperable scram accumulators.

Answer: A

Explanation:

TS 3.1.5 Action B.1 With two or more control rod scram accumulators inoperable and reactor steam dome pressure ≥ 600 psig, adequate pressure must be supplied to the charging water header. With inadequate charging water pressure, all of the accumulators could become inoperable, resulting in a potentially severe degradation of the scram performance. Therefore, within 20 minutes from discovery of charging water header pressure < 1540 psig concurrent with Condition B, adequate charging water header pressure must be restored. The allowed Completion Time of 20 minutes is considered a reasonable time to place a CRD pump into service to restore the charging header pressure, if required.

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Distracters:		
<p>B and C are wrong, but plausible because accumulator low pressure and water detection in the accumulator instrument block both cause the CRD accumulator trouble alarm, required operable by TR 3.1.5. But both answers are wrong. Moisture in the accumulator instrument block does not directly require declaring the accumulator inoperable. Low pressure does require individual accumulators to be declared inoperable, but this is addressed by TS 3.1.5 Actions B.2.1 and B.2.2.</p> <p>D is wrong, but plausible because inserting and disarming a control rod would be necessary if the rod was declared inoperable, which is an alternative to declaring a control rod "slow" when its accumulator is inoperable. However, this is wrong because TS 3.1.5 Action B does not address urgency for inserting/disarming a control rod, only for restoring a CRD pump to operation.</p>		
K/A Match		
<p>Applicant must know the purpose of the 20 minute completion time in tech spec bases for CRD system. The applicant must have knowledge of the major component and controls that must be operated within the 20 minutes.</p>		
Technical References:		
<p>Technical Specifications 3.1.5 and bases.</p>		
Handouts to be provided to the Applicants during exam:		
<p>NONE</p>		
Learning Objective:		
<p>RPPT-STM-52-HLO 01, Objective Identify Tech Spec/TRM applicable to CRD</p>		
Question Source:	Bank # 2013 GGN NRC	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(2)	
Level of Difficulty:	3	
SRO Only Justification:		
<p>Applicant must have knowledge of TS bases that is required to analyze TS-required actions and terminology</p>		

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PRA Applicability:

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Examination Outline Cross Reference	Level	SRO
223001 (SF5 PCS) Primary Containment and Auxiliaries Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6) A2.06 High containment pressure Mark-III	Tier	2
	Group #	2
	K/A	223001 A2.06
	Rating	4.1
	Revision	0
Revision Statement:		

Question: 82

A steam leak has occurred resulting in the following plant conditions:

- Drywell Pressure 1.4 psid
- Containment Pressure 2.1 psig
- Normal containment vent and purge is in service

(1) Which of the following describes the impact of the above conditions?

(2) What procedure should the CRS direct to mitigate the consequences of this condition?

- A. (1) Damage to the HVAC ductwork;
 (2) SOP-0059, Containment HVAC System, to secure normal containment vent and purge.
- B. (1) Damage to the HVAC ductwork;
 (2) EOP Enclosure 21 for Emergency Containment Venting.
- C. (1) Containment vent valves cannot be opened;
 (2) SOP-0059, Containment HVAC System, to secure normal containment vent and purge.
- D. (1) Containment vent valves cannot be opened;
 (2) EOP Enclosure 21 for Emergency Containment Venting.

Answer: A
Explanation: Above 2 psig, normal containment vent and purge must be secured in order to prevent

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damage to the Aux Bldg HVAC ductwork which is used during this evolution.		
Distracters:		
B. Part 1 is correct, but Enclosure 21 is used to maintain pressure below 30 psig. It would be inappropriate to override interlocks and vent containment at 2.1 psig.		
C. The pressure which corresponds to the inability to operate containment vent valves for venting purposes is 15 psig. Part 2 is correct.		
D. See "C". Enclosure 21 is used to maintain pressure below 30 psig. It would be inappropriate to override interlocks and vent containment at 2.1 psig.		
K/A Match		
The applicant must analyze the conditions given and identify the high containment pressure. Based on the high containment pressure, the applicant must select the procedure to mitigate the consequences of the high containment pressure.		
Technical References:		
EOP-0002, EPSTG*0002 B-8-11		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-HLO-0514 EOP-2 Bases, Objective:		
5. Given an EOP step identify the basis for the action taken.		
6. Given the EOP-2 Flowchart and Plant Conditions determine the next action to be implemented.		
Question Source:	Bank # March 2014 NRC	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
Applicant must assess plant conditions and then select the procedure to mitigate the given plant conditions.		

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PRA Applicability:

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Examination Outline Cross Reference	Level	SRO
245000 Main Turbine Generator and Auxiliary Systems A2. Ability to (a) predict the impacts of the following on the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A2.02 Loss of lube oil	Tier	2
	Group #	2
	K/A	245000 A2.02
	Rating	3.5
	Revision	2
Revision Statement: Rev 1 Revised the stem and answers to remove TGOP from the answer choices Rev 2 removed IS/IS NOT from the stem of the question		

Question: 83

RBS is at 55% power when the Main Turbine bearing oil header experiences pressure perturbations.

- Main Shaft Oil Pump (MSOP) pressure lowers to 185 psig
- Bearing header pressure lowers to 14 psig and stabilizes

(1) Based on these parameters, the Emergency Bearing Oil Pump (EBOP) __ (1) __ operating.

(2) Which procedure should be transitioned to from the ARP to mitigate the transient?

AOP-0002 MAIN TURBINE AND GENERATOR TRIPS
 SOP-0012 MAIN TURBINE LUBE OIL SYSTEM

- | | |
|--------------|--------------|
| (1)
A. IS | (2)
AOP-2 |
| B. IS | SOP-12 |
| C. IS NOT | AOP-2 |
| D. IS NOT | SOP-12 |

Answer: D
Explanation:
Based on the two pressure parameters, only the TGOP pump would be running. It starts

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when Bearing header pressure drops below 15 psig. EBOP requires Bearing header pressure to be less than 10 psig to auto start. Bearing Header pressure of 15 psig brings in the alarm, but a Turbine Trip doesn't occur until 12 psig which would require entry into AOP-2. Since Bearing header pressure remains steady at 14 psig, only actions in SOP-12 are needed to restore Main the lube oil system.

Distracters:

If the applicant confuses the TGOP and EBOP setpoints, the applicant would select the EBOP as running.

If the applicant confuses the turbine trip setpoint, the applicant would select the AOP-2 turbine trip.

K/A Match

The applicant must diagnose the given plant conditions for a loss of lube oil (low lube oil pressure). Based on the given parameters, the applicant must then select the procedure used to mitigate the low lube oil pressure.

Technical References:

H13-P680/15A/B03, BEARING HEADER LOW PRESSURE
 R-STM-111, Turbine Lube Oil System
 SOP-12, Main Turbine Lube Oil System
 AOP-2, Main Turbine and Generator Trips

Handouts to be provided to the Applicants during exam:

NONE

Learning Objective:

RLP-STM-0111 Objective 4

Given any of the following Control Room annunciators, state the possible causes of the alarm and status of the Turbine Lube Oil System.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		

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The applicant must analyze the indications and determine which procedure must be implemented to mitigate the lube oil transient.

PRA Applicability:

Reactor Trip/Turbine Trip is in the top ten internal events contributing to RBS baseline core damage frequency.

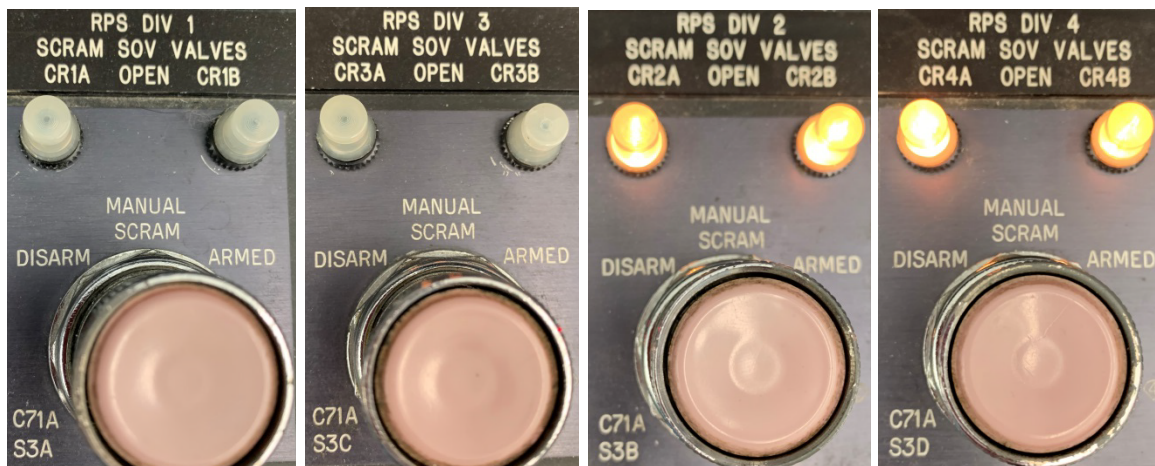
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Examination Outline Cross Reference	Level	SRO
295006 (APE 6) Scram Ability to determine and/or interpret the following as they apply to SCRAM: AA2.05 Whether a reactor SCRAM has occurred	Tier	1
	Group #	1
	K/A	295006 AA2.05
	Rating	4.6
	Revision	3
Revision Statement:		
Rev 1: Added part (1) to determine scram has occurred to match KA closer.		
Rev 2: Changed photo to make both procedures more plausible.		
Rev 3 Added the word ONLY to answers A and C		

Question: 84

The plant is operating at rated power.

Then a transient occurs resulting in the following indications:



(1) Based on the indications provided, should ANY rods have scrammed?

(2) Which procedure transition(s) is(are) required to recover the plant?

AOP-1, Reactor Scram

AOP-10, Loss of One RPS Bus

(1)

(2)

A. YES

AOP-1 ONLY

B. YES

AOP-1 and AOP-10

C. NO

AOP-10 ONLY

D. NO

AOP-1 and AOP-10

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Answer: A

Explanation:

NOTE: The photos are arranged in the same order they would appear on the P680 from left to right.

Per R-STM-0508, Reactor Protection System, The RPS is comprised of two trip systems, A and B, each made up of two trip logic channels . Trip Logic Channels A and C make up Trip System A while Trip System B consists of Channels B and D.

The RPS logic arrangement is referred to as a, “one-out-of-two, taken twice” design. A trip in either of the two channels in Trip System A, coincident with a trip from either channel in Trip System B will result in a reactor scram. Note that a trip in both Trip Systems is required for a scram (what is termed a “Full Scram”).

Both lights out for RPS Div 1 and Div 3 are indications of a partial scram. Rods for those divisions were inserted.

Only AOP-1 requires entry due to partial scram. Per AOP-1, Subsequent Operator Actions 5.1, IF any Control Rods are not fully inserted, THEN insert those rods using the Shutdown Control Rod Sequence Package. Refer to EOP-5, Enclosure 26, Control Rod Insertion Method Determination.

Distracters:

(1) No is plausible if applicant confuses indications for a loss of RPS A. If applicant believes there is only a loss of RPS A, then no rods would insert. If rods did not insert but were required to insert due to plant transient, then AOP-1 subsequent actions are used to insert the rods to shut down the reactor.

(2) AOP-10 is plausible if applicant confuses indications for a loss of RPS A. The indications for a loss of RPS A would be the left light out for each division.

K/A Match

Applicant must interpret RPS light indications and determine if a SCRAM has occurred. Based on the indications the applicant must then determine the procedure transition required to stabilize the plant.

Technical References:

R-STM-0508, Reactor Protection System, Revision 8

AOP-1, Reactor Scram

AOP-10, Loss of RPS

Handouts to be provided to the Applicants during exam:

NONE

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Learning Objective:		
RLP-STM-0508-LO, Objectives (5): Describe how the following controls, indications, and/or interlocks affect the status of the Reactor Protection System: (5) Manual Scram pushbuttons		
Question Source:	Bank #	
	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	41(b)(7)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must assess the given indications and determine the plant status. Based on the indications the applicant must select the procedure transition required to recover the plant.		
PRA Applicability:		
Reactor Protection system, RPS is #4 Risk Significant System.		
Reactor Trip/Turbine Trip is in the top ten internal events contributing to RBS baseline core damage frequency.		

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Examination Outline Cross Reference	Level	SRO
295019 (APE 19) Partial or Complete Loss of Instrument Air Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR: AA2.01 Instrument air system pressure	Tier	1
	Group #	1
	K/A	295019 AA2.01
	Rating	3.6
	Revision	2
Revision Statement: Rev 1 Updated pic to read higher pressure and Changed A and D to make more wrong. Rev 2 reordered distractors from smallest to biggest		

Question: 85

Instrument Air Header is leaking and lowering in pressure at a rate of 1psig/min.

Based on the indication below, what action(s) should be directed NEXT by the Control Room Supervisor per AOP-8, Loss of Instrument Air?



- A. Scram the Reactor and verify the MSIVs are closed
- B. Take manual control of the feedwater level control system
- C. IF Individual rod movement is observed, THEN Scram the Reactor.

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- D. Manually initiate the RCIC System AND notify Radiation Protection of the potential impact to plant radiological conditions.

Answer: C		
Explanation: AOP-8 Loss of Instrument Air(Subsequent Actions 5.2) states: IF any of the following occurs, THEN Scram the Reactor and enter AOP-0001, Reactor Scram: Individual rod movement is observed. At H13-P870 on IAS-PI105, instrument air header pressure lowers to 90 psig		
Distracters: B. Per AOP-8, the feedwater Reg Valves lock up and fail as is on low air pressure less than or equal to 85 psig. D. Manually initiate the RCIC System AND notify Radiation Protection of the potential impact to plant radiological conditions is an action listed in AOP-8 but only after the Reactor is scrammed. A. Scram the reactor is required per Subsequent Operator Actions 5.2 at 90 psig, but the MSIVs are closed at 50 psig. The MSIV should be maintained open as long as possible to transfer heat to the condenser instead of containment.		
K/A Match Applicant must determine from the picture that instrument air pressure has degraded to a value that requires entry into AOP-8 and actions from the procedure must be taken		
Technical References: AOP-8, Loss of Instrument Air		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: RLP-OP-AOP0008 Objective 5 Describe the immediate (if applicable) and subsequent operator actions associated with AOP-0008, Loss of Instrument Air.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive /	X

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	Analysis	
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must make an assessment of plant conditions (normal, abnormal, or emergency) and then select a procedure or section of a procedure to mitigate or recover, or with which to proceed		
PRA Applicability:		
Instrument and Service Air, IAS-SAS is #2 Risk Significant System		

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Examination Outline Cross Reference	Level	SRO
295021 (APE 21) Loss of Shutdown Cooling 2.1.32 Ability to explain and apply system limits and precautions.	Tier	1
	Group #	1
	K/A	295021 2.1.32
	Rating	4.0
	Revision	1
Revision Statement: Rev 1 Changed question source from modified to new		

Question: 86

Technical Specifications Section 3.4.10, Residual Heat Removal (RHR) Shutdown Cooling System-Cold Shutdown, for a loss of shutdown cooling event states:

Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to ___(1)___ hours per 8 hour period.

Residual Heat Removal System is included in the Technical Specifications Section 3.4.10, Residual Heat Removal (RHR) Shutdown Cooling System-Cold Shutdown, for a loss of shutdown cooling event because it is required ___(2)___.

- | | | | |
|----|-----|-----|--|
| | (1) | (2) | |
| A. | 2 | | for risk reduction against core damage |
| B. | 2 | | to meet the applicable criterion within the NRC Policy Statement |
| C. | 4 | | for risk reduction against core damage |
| D. | 4 | | to meet the applicable criterion within the NRC Policy Statement |

Answer: A

Explanation:

Per LCO 3.4.10 Residual Heat Removal (RHR) Shutdown Cooling System-Cold Shutdown, Both RHR shutdown cooling subsystems and recirculation pumps may be removed from operation for up to 2 hours per 8 hour period.

Per 3.4.10 Bases, Applicable safety analyses, Decay heat removal by the RHR System in the shutdown cooling mode is not required for mitigation of any event or accident evaluated in the safety analyses. Decay heat removal is, however, an important safety function that must be accomplished or core damage could result. Although the RHR Shutdown Cooling System does not meet a specific criterion of the NRC Policy Statement, it was identified in the NRC Policy Statement as a significant contributor to risk reduction. Therefore, the RHR Shutdown Cooling System is retained as a Technical Specification.

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Distracters:		
C & D 4 hours is plausible if applicant confuses requirement per LCO 3.5.2 ECCS-Shutdown. Condition A states One required ECCS injection/spray subsystem inoperable (RHR is an injection system) . A.1 Restore required ECCS Injection/spray subsystem to OPERABLE status in 4 hours.		
B & D Per 3.4.10 bases, criterion of the NRC Policy Statement, it was identified in the NRC Policy Statement as a significant contributor to risk reduction.		
K/A Match		
The applicant is required to know the limits for removing shutdown cooling from service (loss of shutdown cooling). The applicant must also understand why a loss of shutdown cooling (3.4.10) is covered in technical specifications.		
Technical References:		
Technical Specifications Section 3.4.10, Residual Heat Removal (RHR) Shutdown Cooling System-Cold Shutdown, for a loss of shutdown cooling event		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-STM-0204 Objective 12 Identify the Technical Specifications, Technical Requirements Manual, and/or Bases requirements for the Residual Heat Removal System.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must know the limits for removing RHR shutdown cooling and then per technical specification bases why it is included.		
PRA Applicability:		

Original Question - 2016 NRC

Question 88

The Reactor has been shut down for a refueling outage for 30 days fuel shuffle/reload has been completed.

- The “B” Train of RHR is in operation removing decay heat.
- Fuel Transfer canal has been drained
- A surveillance is to be performed on the “A” Train of RHR that will render it inoperable.
- The “A” train is expected to be inoperable for a total of 1 hour.

(1) Is the removal of one of the required Trains of RHR allowed?

(2) What is the Basis for allowing or not allowing this surveillance to occur?

A. Yes,

Removal of one required train is allowed per Technical Specifications. The basis for this allowance is that RCS pressures and Temperatures are being closely monitored as required by LCO 3.4.11, RCS Pressure and Temperature Limits.

B. No,

Removal of one required train is not allowed per Technical Specifications. The basis for not allowing this is because decay heat removal is an important safety function that must be accomplished or core damage could result.

C. Yes,

Removal of one required train is allowed per Technical Specifications. The basis for this allowance is because the core heat generation can be low enough and the heatup rate slow enough to allow for loss of redundancy in the RHR system.

D. No,

Removal of one required train is not allowed per Technical Specifications. The basis for this that two RHR subsystems must remain operable to allow for accurate average coolant temperature monitoring and management of gas voids.

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Examination Outline Cross Reference	Level	SRO
295027 (EPE 4) High Containment Temperature 2.4.18 Knowledge of the specific bases for EOPs.	Tier	1
	Group #	1
	K/A	295027 2.4.18
	Rating	4.0
	Revision	1
Revision Statement: Rev 1 Reordered distractors from smallest to biggest		

Question: 87

EOP-2, Primary Containment Control, states “BEFORE CTMT temperature reaches ___(1)___, enter EOP-1.”

In accordance with EOP-2 and its associated bases, a containment temperature which cannot be maintained less than the design set-point requires Emergency Depressurization to ___(2)___.

- A. (1) 145°F
(2) reduce the severity of an offsite radioactivity release.
- B. (1) 145°F
(2) extend equipment operability within containment for as long as possible during an event
- C. (1) 185°F
(2) reduce the severity of an offsite radioactivity release
- D. (1) 185°F
(2) extend equipment operability within containment for as long as possible during an event.

Answer: D

Explanation:

In accordance with EOP-2 and its bases, step CT-6, an ED is required at 185F to “terminate, or reduce as much as possible, any continued containment temperature increase and thereby maintain equipment operability for as long as possible.”

Distractors:

145°F is incorrect because this is the number associated with Drywell Temperature decision point per EOP-2 step DWT-2.

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Reducing the severity of an offsite radioactivity release is incorrect because these words are part of the basis for step RR-6 in EOP-3.		
K/A Match		
Applicant must have knowledge of high containment temperature decision point in EOP-2. Applicant must also have knowledge of the EOP basis for step to Emergency Depressurize due to high containment temperature.		
Technical References:		
EOP-2 and bases		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-HLO-0514 EOP-2 Bases, Objective:		
5. Given an EOP step identify the basis for the action taken.		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #2016 NRC #51	X
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(9)	
Level of Difficulty:	3	
SRO Only Justification:		
SRO knowledge required to know setpoint of decision point to enter EOP-1 from EOP-2. SRO should also be familiar with EOP bases.		
PRA Applicability:		

2016 NRC Examination Original Question

In accordance with EOP-2 and its associated bases for step CT-6, a containment temperature which cannot be maintained less than the design set-point requires Emergency Depressurization _____.

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- A. in order to extend equipment operability within containment for as long as possible during an event.
- B. while the rate of energy transfer from the RPV to containment is less than the capacity of the containment vents during an event.
- C. to reduce the driving head and flow of primary systems that are discharging into secondary containment.
- D. to reduce the severity of an offsite radioactivity release.

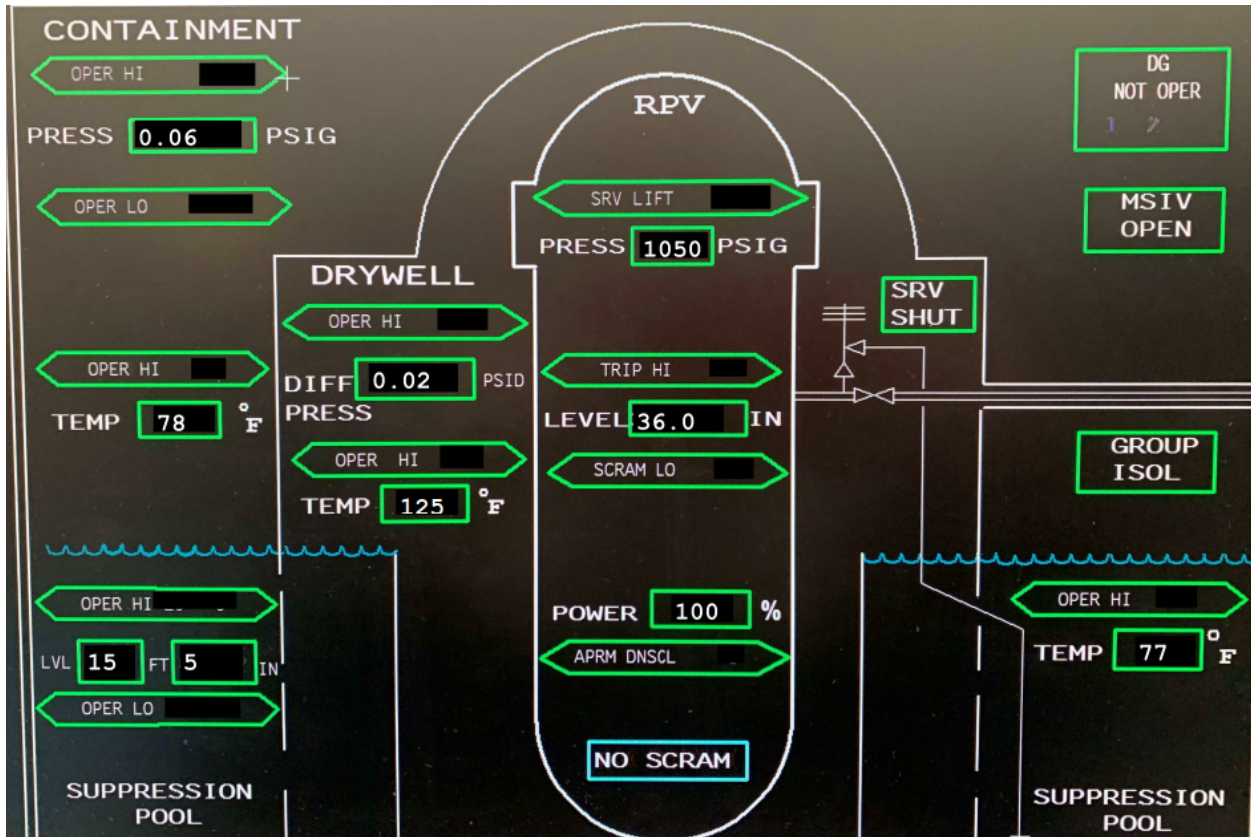
Answer: A

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Examination Outline Cross Reference	Level	SRO
295030 (EPE 7) Low Suppression Pool Water Level / 5 Ability to determine and/or interpret the following as they apply to LOW SUPPRESSION POOL WATER LEVEL: (CFR: 41.10 / 43.5 / 45.13) EA2.01 Suppression pool level	Tier	1
	Group #	1
	K/A	295030 EA2.01
	Rating	4.2
	Revision	0
Revision Statement:		

Question: 88

Based on the following indications:



Which of the following procedures should be implemented?

- EOP-1, RPV Control
- EOP-2, Primary Containment Control
- Enclosure 30, Suppression Pool Makeup

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- A. Enclosure 30 ONLY
- B. EOP-1 and EOP-2 ONLY
- C. EOP-2 and Enclosure 30 ONLY
- D. EOP-1, EOP-2, and Enclosure 30.

Answer: D		
Explanation:		
Per EOP-2, Maintain SP level above 15 ft 5 inches with any of the following systems: Normal SP makeup (Enclosure 30) per SPL-9. Before SP level drops to 15 ft 5 inches, enter EOP-1 per SPL-11.		
Distracters:		
Answers A, B, and C are all plausible if applicant fails to recognize requirement to enter all three procedures.		
Note: The photo will be printed in black and white, so the color of the border will not provide cueing to the applicant. The photo has text inserted in every block to ensure nothing is cued with just changing the problem area. Also, all of the setpoints have been blacked out to ensure the photo does not provide additional information.		
K/A Match		
Applicant is required to interpret photo of plant conditions given in PDS overview and identify the low suppression pool level is the limiting indication.		
Technical References:		
EOP-1, RPV Control EOP-2, Primary Containment Control Enclosure 30, Suppression Pool Makeup		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-HLO-0514 EOP-2 Bases, Objective: 6. Given the EOP-2 Flowchart and Plant Conditions determine the next action to be implemented.		
Question Source:		
Bank #		
Modified Bank #		
New		
(note changes and attach parent)		X

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Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
Applicant is required to assess plant conditions and select the proper procedures and enclosures to implement to mitigate the conditions. The applicant must have the knowledge of how and when to implement these procedures per decision points in EOP-2.		
PRA Applicability:		

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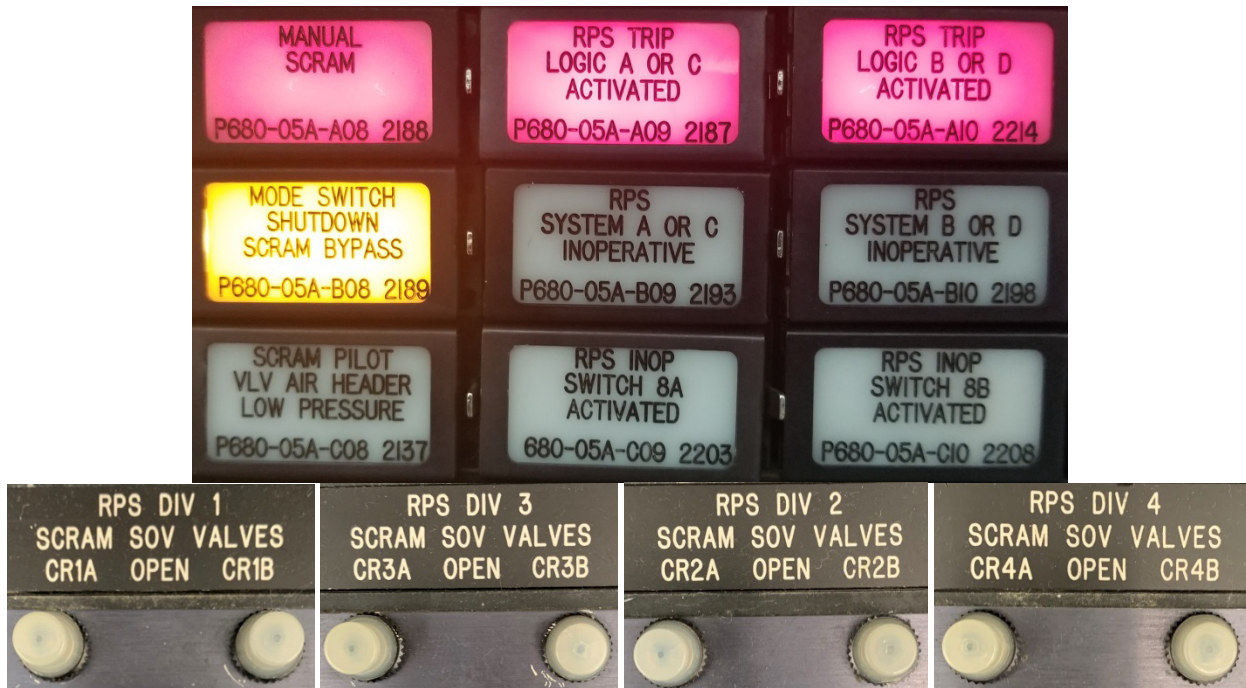
Examination Outline Cross Reference	Level	SRO
295037 (EPE 14) Scram Condition Present and Reactor Power Above APRM Downscale or Unknown 2.4.50 Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	Tier	1
	Group #	1
	K/A	295037 2.4.50
	Rating	4.0
	Revision	2
Revision Statement: Rev 1: Added RPS light photos. Rev 2 Fixed typo in distractor A		

Question: 89

Due to a lowering Main Condenser vacuum, the CRS has directed the ATC operator to place the Reactor Mode switch to SHUTDOWN.

All Immediate Operator Actions of AOP-0001, Reactor Scram, were then performed.

These are the current indications on H13-PNL680:



What action should the CRS direct to insert ALL control rods at the same time?

- A. ENCL 10 De-energize scram solenoids
- B. ENCL 11 Vent the scram air header

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C. ENCL 13 Place HCU test switches in TEST

D. ENCL 17 Vent CRD over piston volume

Answer: B

Explanation:

Based on the indications provided the P680-05A-C08 is not lit, indicating the air header has not been vented. Per EOP-1A, RPV Control ATWS, RQA-2, Failure of air header to vent actions: Vent the scram air header (ENCL 11).

The RPS lights provide indications that the RPS solenoid operated valves did deenergize.

Distracters:

A. Plausible if applicant confuses with a failure to de-energize actions. Per EOP-1A De-energize scram solenoids (ENSL 10).

C. Plausible if applicant confuses with hydraulic lock actions. per EOP-1A, Place individual scram test switches in TEST (ENCL 13). This also wrong because only one rod would be inserted at a time.

D. Plausible if applicant understands the failure of air header to vent actions, but does not understand the application of Enclosure 17. Venting CRD over piston volume would not insert all of the rods at the same time. Per EOP-5, Enclosure 17 purpose is to provide instructions for venting CRD overpiston volumes in an attempt to individually insert control rods.

K/A Match

Based on the alarm indications after a manual scram is inserted, the applicant must diagnose the failure to scram mechanism and select the appropriate EOP enclosure to insert the control rods.

Technical References:

EOP-1A, RPV Control – ATWS

EOP-5, Emergency Operating and Severe Accident Procedures Enclosures

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-HLO-516-ILO, Objective:

Given the applicable Enclosure, and Flowcharts, determine the purpose, method of implementation, and resulting system response for each enclosure (1).

Question Source:

Bank #

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(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must diagnose the given indications and determine when to implement attachments to coordinate inserting all of the rods.		
PRA Applicability:		
Reactor Protection system, RPS is #4 Risk Significant System.		
Reactor Trip/Turbine Trip is in the top ten internal events contributing to RBS baseline core damage frequency.		

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Examination Outline Cross Reference	Level	SRO
600000 (APE 24) Plant Fire On Site Ability to determine and interpret the following as they apply to PLANT FIRE ON SITE: AA2.13 Need for emergency plant shutdown	Tier	1
	Group #	1
	K/A	600000 AA2.07
	Rating	3.8
	Revision	4
Revision Statement: Rev 1: Changed part 2 from EAL declaration for fire to time requirement to make declaration. Rev 2 Rewrote the question to better meet the K/A Rev 3 Rewrote question to new K/A Rev 4: Changed part 1 for time to insert scram confirmatory signal and full NSSSS isolation signal.		

Question: 90

Following a fire in the Main Control Room, the Unit Operator will initiate a Reactor Scram confirmatory signal and a full NSSSS Isolation within a minimum of (1) minutes of scrambling the reactor.

While the ATC Operator is placing transfer switches in the EMERG position at the DIV I Remote Shutdown Panel, a blown control power fuse for E51-F045, RCIC STEAM TO TURB VALVE, has prevented its operation at the Remote Shutdown Panel.

The OSM/Emergency Director will declare this event a/an (2) .

- | | |
|---------------|---------------------|
| (1) | (2) |
| A. 5 minutes | Alert |
| B. 5 minutes | Site Area Emergency |
| C. 15 minutes | Alert |
| D. 15 minutes | Site Area Emergency |

Answer: B

Explanation:

The ATC operator should immediately shutdown the reactor if there is a fire in the Main Control Room.

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The following steps and note in the UO ACTIONS may confuse the applicant about what is required in 5 minutes:

- 1.1 IF a Control Room fire is in progress, THEN initiate a Reactor Scram confirmatory signal and a full NSSSS Isolation as follows:

NOTE

If a Main Control Room fire is in progress, then Step 1.1.1 shall be completed within 5 minutes of scrambling the reactor.

- 1.1.1. At Control Bldg 116 ft el Div 1 Electrical Protection Assemblies area (RPS MG area), perform the following:
1. At RPS A MOTOR GENERATOR SET, depress AND hold the RPS MG-SET MOTOR OFF pushbutton until the red MOTOR ON light goes off.
 2. Place the following Div 1 Electrical Protection Assemblies in OFF:
 - C71-S003C
 - C71-S003F
 - C71-S003A
 - C71-S003E
 3. At RPS B MOTOR GENERATOR SET, depress AND hold the RPS MG-SET MOTOR-OFF pushbutton until the red MOTOR ON light goes off.
 4. Place the following Div 2 Electrical Protection Assemblies in OFF:
 - C71-S003H
 - C71-S003D
 - C71-S003G
 - C71-S003B

For EALs that specify duration of the off-normal condition, such as fire lasting 15 minutes, loss of power for 15 minutes, etc.:

1. The Emergency Director shall make the declaration at the first available opportunity when the time has elapsed (not after an additional 15 minutes).
2. The declaration should be made before the EAL is met (before the time duration has elapsed) when the Emergency Director has information that the off-normal

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condition will not be corrected within the specified time duration.

SITE AREA EMERGENCY	ALERT
<p>HS3 1 2 3 4 5 D</p> <p>Control room evacuation has been initiated and plant control cannot be established</p> <p>Emergency Action Level(s):</p> <p>1. a. Control room evacuation has been initiated</p> <p style="text-align: center;">AND</p> <p>b. Control of the plant cannot be established in accordance with AOP-0031, Shutdown from Outside the Main Control Room, within 15 minutes</p>	<p>HA3 1 2 3 4 5 D</p> <p>Control room evacuation has been initiated</p> <p>Emergency Action Level(s):</p> <p>1. AOP-0031, Shutdown from Outside the Main Control Room requires Control Room evacuation</p>

With RCIC disabled due to the loss of E51-F045, plant control cannot be established in 15 minutes. AOP-31 states "It is expected that RCIC will be the initial source of makeup to the RPV once this transfer has been completed".

Site Area Emergency should be declared".

HS3 EAL BASES states:

The intent of the EAL is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions such as reactivity control (ability to shutdown the reactor and maintain it shutdown), reactor water level (ability to cool the core), and decay heat removal (ability to maintain a heat sink)

Distracters:

A. Immediate shutdown is required, the classification would not be an Alert
C and D. within 5 minutes is not correct, shutdown should happen immediately. 5 minute action is to trip the MG sets per Section 1.1 of AOP-31

K/A Match

The applicant must have knowledge of a common electrical failure to Containment Unit Coolers. The applicant must also apply knowledge of the time requirements for making an emergency declaration based on a fire.

Technical References:

AOP-31
 EIP-2-001

Handouts to be provided to the Applicants during exam:

EIP-2-001 Attachment 4

Learning Objective:

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RLP-OPS-AOP031 Describe the immediate (if applicable) and subsequent operator actions associated with AOP-0031, Shutdown from Outside the Main Control Room. (4)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)()	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must have knowledge of Emergency Implementation Procedures to ensure the Emergency is classified and declared within the required time.		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
295007 (APE 7) High Reactor Pressure / 3 Ability to determine and/or interpret the following as they apply to HIGH REACTOR PRESSURE: (CFR: 41.10 / 43.5 / 45.13) AA2.02 Reactor power	Tier	1
	Group #	2
	K/A	295007 AA2.02
	Rating	4.1
	Revision	0
Revision Statement:		

Question: 91

A reactor scram signal was generated due to a MSIV isolation.

Ten minutes after the scram pressure control is stabilized as follows:

One SRV is manually opened

B21-F051D is in automatic controlling reactor pressure

What pressure band should the CRS direct?

- A. 500 to 700 psig
- B. 500 to 1090 psig
- C. 800 to 1090 psig
- D. 950 to 1090 psig

Answer: C

Explanation:

Per OSP-53, Attachment 1B, Post Scram Pressure Control Strategies, 2.2.1. MSIV Isolation 1. Take manual control to open the number of SRVs that are required to control pressure, based on reactor power (each SRV should be able to handle approximately 7% power), leaving the lowest low-low set valve, B21-F051D, in auto to control pressure in the prescribed band by cycling at its designed set points (956 to 1063 psig). If pressure continues to lower after B21-F051D closes, then too many SRVs are open, and they should be closed until an upward pressure trend is established. If pressure continues to rise after B21-F051D opens, then there are not enough SRVs open, and another SRV should be opened to establish a downward pressure trend.

Per the indications, with one SRV open and B21-F051D is automatically controlling

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reactor pressure reactor power is greater than 7%. Ten minutes after the scram this would indicate an ATWS condition. Per OSP-53, Pressure Control Strategies, during an ATWS when stabilized, the pressure band should be 800-1090 psig.

Distracters:

- A. Durign a Non-ATWS with a leak, when <700 psig, the pressure band is 500 to 700 psig.
- B. During a Non-ATWS the normal band is 500-1090 psig.
- D. During an ATWS the initial band is 950 to 1090 psig. This is not correct because the plant has stabilized and the new pressure band should be directed.

K/A Match

Applicant must understand the relationship between SRV operation (high reactor pressure) and reactor power. The applicant must interpret the ATWS (reactor power) condition to direct the correct pressure band.

Technical References:

OSP-53, EMERGENCY AND TRANSIENT RESPONSE SUPPORT PROCEDURE

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-LO-0513, Objective 6:
 Given flowcharts for EOP-1A, RPV control – ATWS, and EOP-4A, Contingencies – ATWS, and plant conditions; apply the appropriate OSP-0053, Emergency and Transient Response Support Procedure, strategy.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	4	
SRO Only Justification:		
Applicant must have knowledge of EOP decision points and pressure control strategies to direct the correct pressure band for given abnormal conditions.		

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PRA Applicability:
Reactor Trip/Turbine Trip is in the top ten internal events contributing to RBS baseline core damage frequency.

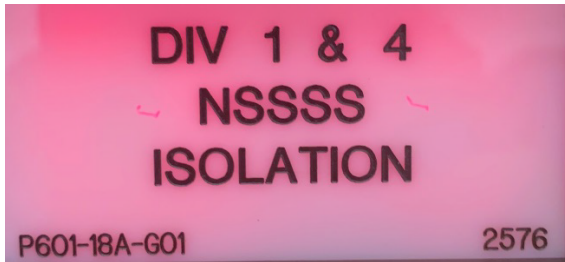
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Examination Outline Cross Reference	Level	SRO
295020 Inadvertent Containment Isolation 2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.	Tier	1
	Group #	2
	K/A	295020 2.4.45
	Rating	4.3
	Revision	0
Revision Statement:		

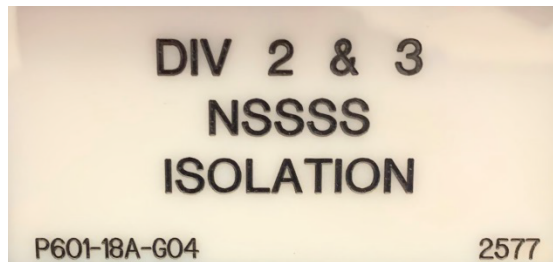
Question: 92

The plant is operating at rated power.

I&C was performing an STP and inadvertently caused the following alarm indications.



(Alarm lit)



(Alarm not lit)

What is the highest priority to restore the plant after the isolation signal has been reset?

- A. Open MSIVs
- B. Restore CCP
- C. Restore RWCU
- D. Restore RHS-AOV63/64

Answer: B

Explanation:

Per H13-P601/18A/G01, DIV 1 & 4 NSSSS ISOLATION, Automatic Actions: 1. Isolation of one or all of the following systems/valves: RWCU, MSL DRAINS, BOP, E12-F040, E12-F075A/B, E12-F008, RHS-AOV63, RHS-AOV64, and RX WTR SAMPLE B33-F020.

Per AOP-3, Automatic Isolations, H13-P870 Group 1 Isolation, there is a note *Notify the OSM/CRS if CCP has been isolated to the Reactor Recirc Pump. With the current alarm in, the inboard CCP valves would have isolated CCP flow to the recirc pumps.

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Per AOP-11, LOSS OF REACTOR PLANT COMPONENT COOLING WATER, 5 Subsequent Operator Actions, CAUTION, If both seal purge flow and cooling water flow are lost to the Reactor Recirc Pump(s) with coolant temperature greater than 200°F, the pump(s) must be tripped, the seal staging valve(s) B33-FVF075A(B) must be closed, and the isolation valves closed as soon as possible. Seal damage may occur if the recirc pump is not tripped within 2 minutes and isolated within 30 minutes. (CR-RBS-2010-00017 CA 25)

CCP must be the highest priority to keep the operating recirc pumps coolant temperature <200°F.

Distracters:

- A. Plausible if applicant confuses logic requirements to isolate MSIVs and MSL Drains.
- C. RWCU did isolate, but the plant can continue to operate for a prolonged period of time with RWCU isolated.
- D. RHS-AOV63/64 did isolate, but the plant can continue to operate for a prolonged period of time with RHS-AOV63/64 isolated.

K/A Match

The applicant must interpret the alarm indications and prioritize the plant recovery based on the indications provided.

Technical References:

H13-P601/18A/G01, DIV 1 & 4 NSSSS ISOLATION
 AOP-3, Automatic Isolations
 AOP-11, LOSS OF REACTOR PLANT COMPONENT COOLING WATER

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

RLP-OPS-AOP0003-LO, Objective 3
 Given AOP-0003 and a description of plant conditions, determine which automatic isolations and actions should have occurred and their impact.

Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X

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10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification: The applicant must assess the indications provided and then select the system priority to be restored based on subsequent actions in different procedures.		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
295032 High Secondary Containment Area Temperature EA2. Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE : EA2.03 Cause of high area temperature	Tier	1
	Group #	2
	K/A	295032 EA2.03
	Rating	4.0
	Revision	2
Revision Statement: Rev 1: Revised question to RHR A Equipment Area Temperature in Mode 1. Rev 2: Swapped RHR equip room to Main Steam Line Tunnel and removed EOP-3 table..		

Question: 93

The plant is operating in MODE 1

1. Which area could contain a RCIC steam leak to cause an elevated temperature?
2. Per EOP-3, what procedure must be implemented to shutdown the reactor if TWO areas listed in SC-2 exceed Max Safe Area Temperature with the steam leak isolated?

- | | |
|---------------------------|-------|
| (1) | (2) |
| A. RWCU Pump Room | EOP-1 |
| B. RWCU Pump Room | GOP-2 |
| C. Main Steam Line Tunnel | EOP-1 |
| D. Main Steam Line Tunnel | GOP-2 |

Answer: D

Explanation:

(1) There is RCIC piping that is contained in the Main Steam Tunnel. Per R-STM-0209, RCIC, Table 1 Component Locations, E51-F064 (RCIC STM SPLY LINE OUTBD ISOL VALVE) is located in 114' Steam tunnel. A packing leak from this valve or a piping rupture near this valve could cause an elevated temperature in the Main Steam Tunnel.

(2) EOP-3 states that the reactor should be shutdown per GOP-2 if the Max Safe Operating Value (200 degrees) in 2 or more Areas is exceeded, if a primary system was discharging into Sec CTMT then EOP-1 would be used.

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Distracters:		
<p>(1) The RWCU room does not contain RCIC piping. RWCU is plausible because RWCU and RCIC piping are both located in common locations in the plant such as MSL Tunnel.</p> <p>(2) EOP-1 is plausible if the leak was not isolated. If the applicant confuses the two requirements for a primary system discharging into the Sec STMT or MSL tunnel, before any Sec CTMT or MSL tunnel parameter reaches its Table SC-2 max Safe Operating Value, enter EOP-1.</p>		
K/A Match		
<p>The applicant must state what could cause a high area temperature in Sec CTMT. The applicant must also know the procedure used to shutdown the reactor (i.e. scram vs controlled shutdown).</p>		
Technical References:		
<p>R-STM-0209, RCIC EOP-3, SECONDARY CONTAINMENT and RADIOACTIVITY RELEASE CONTROL PID-27-06A PID-27-07B</p>		
Handouts to be provided to the Applicants during exam:		
NONE		
Learning Objective:		
<p>RLP-HLO-0515 Objective 6 Given EOP-0003 chart and plant conditions, determine the next action required to be implemented.</p>		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	
	Comprehensive / Analysis	X
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
<p>The applicant must possess knowledge of diagnostic steps and decision points in the EOPs that involve transitions to event-specific sub-procedures or emergency contingency procedures</p>		

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PRA Applicability:

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Examination Outline Cross Reference	Level	SRO
1. Conduct of Operations 2.1.9 Ability to direct personnel activities inside the control room.	Tier	3
	Group #	
	K/A	2.1.9
	Rating	4.5
	Revision	1
Revision Statement: Rev 1 Added "on-shift" to the stem of the question		

Question: 94

Per EN-OP-115, Conduct of Operations, who has the authority on-shift to clear the Control Room of unnecessary personnel not supporting operations?

- A. ATC and CRS ONLY
- B. CRS and SM ONLY
- C. ATC, CRS, and SM ONLY
- D. All Licensed Operators

Answer: B

Explanation:

Per EN-OP-115,
4.0 RESPONSIBILITIES

1. Shift Manager
 - x Access to the Control Room is the ultimate responsibility of the Shift Manager including determination of who will be allowed to give access to the Control Room.
 - x Has authority to clear the Control Room of unnecessary personnel not supporting operations.
2. Control Room Supervisor
 - x Has authority to clear the Control Room of unnecessary personnel not supporting operations.
 - x Can allow access to the Control Room.

Distracters:

A. ATC and CRS are plausible if applicant recognizes the CRS does have the authority. The ACT is plausible because the ATC operator authorizes entry into the ATC area. Per EN-OP-115, 3. ATC Operator or other on-shift Control Room Watchstanders
x Have authority to authorize entry into the ATC Area, Surveillance Area or Controls Area.

C. If applicant correct remembers the CRS and SM, but adds the ATC. See A.

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D. Plausible if applicant confuses with other responsibilities listed in EN-OP-115 for all Operators.		
K/A Match		
The applicant must be knowledgeable of who has the authority to direct unnecessary personnel inside the control room to clear out if not supporting operations.		
Technical References:		
EN-OP-115, Conduct of Operations		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-HLO-02026 Objectives: List ten responsibilities of the OSM (2). List seven responsibilities of the CRS (3). List five responsibilities of the NCO (4)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(3)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must have knowledge of EN-OP-115 that specifies how to coordinate plant operations during normal, abnormal, and emergency situations. The applicant must have knowledge of the authority to clear the control room.		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
2. Equipment Control 2.2.11 Knowledge of the process for controlling temporary design changes.	Tier	3
	Group #	
	K/A	2.2.11
	Rating	3.3
	Revision	1
Revision Statement: Rev 1 Changed distractor A to say Control Room Supervisor		

Question: 95

An event has occurred which presents an imminent threat to the safety of the plant. In order to mitigate the event a temporary modification must be installed as directed by the Shift Manager.

Whose concurrence is required to implement the emergency temporary modification?

- A. The Control Room Supervisor
- B. The RBS Vice President (VP)
- C. The General Manager Plant Operations
- D. The Engineering Director or his designee

Answer: D
Explanation: Per EN-DC-136, 5.3 EMERGENCY TEMPORARY MODIFICATION IMPLEMENTATION [1] In the event of an imminent threat to the safety of personnel or facilities: (a) The Shift Manager, with the concurrence of the Engineering Director, or designee, and a completed 50.59 screening prior to implementation, may direct the installation or removal of a Temporary Modification to the plant on an "emergency" basis without approved controlling documentation, as long as the Temporary Modification does not adversely affect nuclear safety.
Distractors: A. B. and C. are incorrect because of direct statement made by procedure but are plausible because all of these individuals are required for authorizing various activities in the plant.
K/A Match The applicant must have knowledge of the process for controlling temporary design changes and who is involved in the process.

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Technical References: EN-DC-136, Temporary Modifications, Rev 10 Section 5.3		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: Per RLP-OPS-HLO-200-LO Objectives: Describe the flow path of a modification (EC) from inception to full operation. (2) Explain key steps in the modification (EC) process.(3)		
Question Source:	Bank # Dec 2014 NRC	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(3)	
Level of Difficulty:	2	
SRO Only Justification: The applicant must have knowledge of the licensee procedures required to obtain authority for design and operating changes in the facility. Specifically the applicant must know the concurrence required for a temporary modification.		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
2. Equipment Control 2.2.21 Knowledge of pre- and post-maintenance operability requirements.	Tier	3
	Group #	
	K/A	2.2.21
	Rating	4.1
	Revision	0
Revision Statement:		

Question: 96

A small packing leak was discovered on a safety related primary containment isolation motor operated valve.

Mechanical maintenance has tightened the packing on the valve per a Work Order.

A maintenance leak check was performed and the leak was stopped.

What post-maintenance testing is required to be performed by Operations before the Work Order may be closed?

- A. Functional stroke of valve IAW system operating procedure only.
- B. Functional stroke of valve IAW the valve operability surveillance test.
- C. Functional stroke of valve with local visual observation IAW system operating procedure.
- D. Local leak rate test (LLRT) to verify Suppression Pool leakage within allowable limits IAW Engineering LLRT procedure.

Answer: B

Explanation:

The applicant is expected to recognize that this is a safety-related primary containment isolation valve. Maintenance activities to tighten the packing of this valve represent a potential to affect the valve stroke time.

Per Technical Specification 3.6.1.3 PCIV, SR 3.6.1.3.4 Verify the isolation time of each power operated and each automatic PCIV, except MSIVs, is within limits.

Distracters:

A is wrong, but plausible. Although this will demonstrate functionality of the valve post-

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maintenance, Tech Specs and the IST program impose valve stroke time requirements that must be determined by a timed valve stroke performed IAW the applicable surveillance procedure.

C is wrong, but plausible. Although this will demonstrate functionality of the valve post-maintenance, Tech Specs and the IST program impose valve stroke time requirements that must be determined by a timed valve stroke performed IAW the applicable surveillance procedure and local observation is not required.

D is wrong, but plausible. Tightening of the valve packing does not present the potential to affect how leak-tight the valve is. While the original packing leak did present a concern for challenging limits on allowable Suppression Pool leakage into the Secondary Containment, a Maintenance leak check PMT is adequate to show that the leakage is stopped. A full LLRT of the penetration is not required.

K/A Match

The applicant must recognize the correct post maintenance test requirements.

Technical References:

TS 3.6.1.3, Primary Containment Isolation Valves (PCIVs), Amendment 120

Handouts to be provided to the Applicants during exam:

None

Learning Objective:

HLO-0415-2, Objective:

11. Given conditions requiring application of Technical Specification administrative controls for OPERABILITY determination and the Operating License Manual, apply the specifications to determine OPERABILITY.

Question Source:	Bank # 2018 Audit	X
(note changes and attach parent)	Modified Bank #	
	New	

Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	

10CFR Part 55 Content:	43(b)(2)	
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Level of Difficulty:	3	
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SRO Only Justification:

The applicant must have knowledge of the bases and surveillance requirements for valves covered by Technical Specifications 3.6.1.3.

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PRA Applicability:

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Examination Outline Cross Reference	Level	SRO
3. Radiation Control 2.3.6 Ability to approve release permits.	Tier	3
	Group #	
	K/A	2.3.6
	Rating	3.8
	Revision	0
Revision Statement:		

Question: 97

Which of the following procedures would the CRS utilize to approve a discharge permit to the Mississippi River?

- A. EN-CY-100, CONDUCT OF CHEMISTRY
- B. ADM-0054, RADIOACTIVE LIQUID EFFLUENT BATCH DISCHARGE;
- C. SOP-0108, LIQUID RADWASTE COLLECTION AND PROCESSING;
- D. SOP-0113, LIQUID RADWASTE PROCESSING/RECOVERY SAMPLE SYSTEM

Answer: B

Explanation:

ADM-0054, RADIOACTIVE LIQUID EFFLUENT BATCH DISCHARGE, established the method for controlling, preparing, reviewing, approving, and documenting all River Bend Station (RBS) Technical Specifications and National Pollutant Discharge Elimination System (NPDES) permit requirements for Liquid Radwaste Recovery Sample Tanks LWS-TK4 A/B/C/D.

Distracters:

- A. EN-CY-100 provides general administrative guidance for the chemistry department.
- C. SOP-0108 is a system operating procedure for the radwaste collection and processing system.
- D. SOP-0113 is a system operating procedure for the discharging LWS tanks to the river, but does not contain permit approval requirements.

K/A Match

The applicant must have knowledge of the procedure requirements for approving a release permit.

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Technical References:		
ADM-0054 Rev 6A		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RLP-STM-0603 Objective: Describe the Recovery Sample Tank Discharge Permit and performing discharges, in regard to: (8) Use and routing of the permit How many permits may be "active" at one time Conditions under which a discharge may be performed with RMS-RE107 inoperable		
Question Source:	Bank # Feb 2014 Audit / April 2010 NRC	X
(note changes and attach parent)	Modified Bank #	
	New	
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification:		
The applicant must have knowledge of the National Pollutant Discharge Elimination System requirements.		
PRA Applicability:		

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Examination Outline Cross Reference	Level	SRO
3. Radiation Control 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	Tier	3
	Group #	
	K/A	2.3.12
	Rating	3.7
	Revision	1
Revision Statement: Rev 1 Changed distractors C and D to Radiation Protection Manager. Changed the stem from HRAs to say VHRAs. The answer is now B.		

Question: 98

RSP-229, Attachment 29 Expedited Access to RCA During AOP, is used in response to situations where the plant is in an Abnormal Operating Procedure and expedited access to the RCA is needed.

The ___(1)___ declares the use for expedited access to the RCA when needed and this ___(2)___ authorize entry into Locked High Radiation Areas.

- | | |
|--|--|
| <p>(1)</p> <p>A. Shift Manager</p> <p>B. Shift Manager</p> <p>C. Radiation Protection Manager</p> <p>D. Radiation Protection Manager</p> | <p>(2)</p> <p>does</p> <p>does not</p> <p>does</p> <p>does not</p> |
|--|--|

Answer: A

Explanation:

Per RSP-229, Operations Shift Manager will declare the use and need for expedited access via notification to the RP shift technicians.

PER RSP-229, Enclosure 20: 1 PURPOSE, 1.1 This enclosure provides general guidance for response to situations where plant is an Abnormal Operation Procedure (AOP) and expedited access to the RCA is needed (this includes HRAs and LHRAs).

Distractors:

(1) RPM is plausible because he normally authorizes entry into LHRAs, and is the only one that authorize entry into VHRAs

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(2) "Does" is plausible if applicant forgets about the VHRA requirement. Per RSP-229, This does not authorize entry into VHRAs, reference EN-RP-101 "Access Control for Radiologically Controlled areas" for access VHRA's.		
K/A Match Question requires knowledge of the shift manager responsibilities during AOP implementation, which includes the process for expedited entry into the RCA. Knowledge is also required of what radiological controlled areas access is allowed.		
Technical References: RSP-229, RADIATION PROTECTION RESPONSE TO CHANGING PLANT CONDITIONS		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: RLP-STM-0204-LO, Objective: Analyze the operational impact of the related Operational Experiences associated with the Residual Heat Removal System. (15)		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(4)	
Level of Difficulty:	2	
SRO Only Justification: The applicant must have knowledge of expedited access requirements for radiological controlled areas. The applicant is also required to know the requirements to implement the attachment in RSP-229. The applicant must have knowledge of the administrative procedure and requirements for implementation and what radiologically controlled area access is allowed.		
OE/PRA Applicability: This is attachment was a corrective action from RBS loss of shutdown cooling in 2016. CR-RBS-2016-03090.		

2019 RBS NRC Examination

2019 RBS NRC Examination

Examination Outline Cross Reference	Level	SRO
4. Emergency Procedures/Plan 2.4.13 Knowledge of crew roles and responsibilities during EOP usage.	Tier	3
	Group #	
	K/A	2.4.13
	Rating	4.6
	Revision	0
Revision Statement:		

Question: 99

If a non throttleable injection source is being used to control RPV level, then the level band should be ___(1)___.

After initial entry into EOP-1, RPV Control, a subsequent Level 3 signal ___(2)___ considered a re-entry into the EOPs when Level 3 is within the prescribed level band.

- | | | |
|----|------------------|--------|
| | (1) | (2) |
| A. | 10 to 51 inches | is |
| B. | 10 to 51 inches | is not |
| C. | -20 to 51 inches | is |
| D. | -20 to 51 inches | is not |

Answer: D

Explanation:

Per OSP-53, Attachment 1A, Post Scram level Control Strategies, if the MSIV'S are closed or in anticipation of their closing, OR if a non throttleable injection source is being used to control RPV level, then widen the band to -20" to 51".

A subsequent Level 3 signal need not be considered a re-entry into the EOPs when Level 3 is within the prescribed level band.

Distracters:

Per OSP-53, Attachment 1A, Post Scram level Control Strategies, in non-ATWS conditions, the preferred level band is 10 to 51 inches.

If the applicant confuses re-entry conditions with entry conditions, or remembers that a level 3 re-entry is required if not included in level band.

K/A Match

2019 RBS NRC Examination

Applicant must understand the SRO responsibility to determine entry requirements for EOPs and application.		
Technical References: OSP-53, EMERGENCY AND TRANSIENT RESPONSE SUPPORT PROCEDURE		
Handouts to be provided to the Applicants during exam: None		
Learning Objective: RLP-HLO_0512, Objective: Given EOP-1 RPV Control and EOP-4 Contingencies flowcharts and plant conditions, accurately apply the strategies provided in OSP-0053, Emergency and Transient Response Support Procedure		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	3	
SRO Only Justification: Applicant must understand proper level band used at decision point for proper level band selection.		
PRA Applicability:		

2019 RBS NRC Examination

Examination Outline Cross Reference	Level	SRO
4. Emergency Procedures/Plan 2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	Tier	3
	Group #	
	K/A	2.4.21
	Rating	4.6
	Revision	0
Revision Statement:		

Question: 100

For EOPs that have an ARP/DRMS temperature alarm associated with the entry condition, the EOP is entered on the receipt of the alarm _____.

- A. ONLY
- B. or highest temperature indication
- C. or lowest temperature indication
- D. or average temperature indication

Answer: D

Explanation:

Per OSP-9, AUTHOR'S GUIDE/CONTROL AND USE OF EMERGENCY OPERATING AND SEVERE ACCIDENT PROCEDURES, for EOPs that have ARP/DRMS alarm associated with the entry condition, initiation of the alarm is to be used for EOP entry (for example – EOP-0003 entry condition for MSL Tunnel temperature 144F requires entry into the EOP if Annunciator P601-19A-H01 is received). The entry condition should be validated by determining the average value using other indications that are available for the same condition/parameter.

These EOPs should also be entered in instances where the alarm is not received but the average value obtained from other available indications indicates the entry conditions are met.

Distracters:

A. Plausible if applicant only remembers the alarm entry requirement.

B and C Plausible if applicant confuses the most conservative temperature associated with the alarm setpoint.

2019 RBS NRC Examination

K/A Match		
Applicant is required to have knowledge of parameters used to assess associated safety functions with EOP entry requirements.		
Technical References:		
OSP-9, AUTHOR'S GUIDE/CONTROL AND USE OF EMERGENCY OPERATING AND SEVERE ACCIDENT PROCEDURES		
Handouts to be provided to the Applicants during exam:		
None		
Learning Objective:		
RPPT-HLO-0515-ILO, Objective 3. Determine if entry is required based on Control Room indication		
Question Source:	Bank #	
(note changes and attach parent)	Modified Bank #	
	New	X
Question Cognitive Level:	Memory / Fundamental	X
	Comprehensive / Analysis	
10CFR Part 55 Content:	43(b)(5)	
Level of Difficulty:	2	
SRO Only Justification:		
Applicant must assess plant conditions and then select the appropriate procedure. A RO will identify possible EOP entry requirements, but the SRO must analyze plant conditions and enter the EOP.		
PRA Applicability:		

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources–Operating

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One required offsite circuit inoperable.</p>	<p>A.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit.</p> <p><u>AND</u></p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>(continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. (continued)</p>	<p>-----NOTE----- - Verification is only required if 22 kV onsite circuit is supplying Division III safety related bus E22-S004 from normal power transformer STX-XNS1C. -----</p> <p>A.2 Verify E22-S004 is aligned to transfer to the preferred station transformer powered by the OPERABLE offsite circuit.</p> <p><u>AND</u></p> <p>A.3 Restore required offsite circuit to OPERABLE status.</p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>72 hours</p> <p><u>AND</u></p> <p>24 hours from discovery of two divisions with no offsite power</p> <p><u>AND</u></p> <p>17 days from discovery of failure to meet LCO</p>
<p>B. Automatic transfer function not OPERABLE</p>	<p>B.1 Restore Division III power source to the preferred station service transformers</p>	<p>12 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. One required DG inoperable.</p>	<p>C.1 Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s).</p> <p><u>AND</u></p> <p>C.2 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.</p> <p><u>AND</u></p>	<p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>4 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)</p> <p>(continued)</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p>C.3.1 Determine OPERABLE DG(s) are not inoperable due to common cause failure.</p> <p style="text-align: center;"><u>OR</u></p> <p>C.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p style="text-align: center;"><u>AND</u></p> <p>C.4 Restore required DG to OPERABLE status.</p>	<p>24 hours</p> <p>24 hours</p> <p>72 hours from discovery of an inoperable Division III DG</p> <p style="text-align: center;"><u>AND</u></p> <p>14 days</p> <p style="text-align: center;"><u>AND</u></p> <p>17 days from discovery of failure to meet LCO</p>
D. Two required offsite circuits inoperable.	<p>D.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.</p> <p style="text-align: center;"><u>AND</u></p> <p>D.2 Restore one required offsite circuit to OPERABLE status.</p>	<p>12 hours from discovery of Condition D concurrent with inoperability of redundant required feature(s)</p> <p>24 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One required offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One required DG inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems–Operating," when any division is de-energized as a result of Condition E. -----</p> <p>E.1 Restore required offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore required DG to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>F. Two required DGs inoperable.</p>	<p>F.1 Restore one required DG to OPERABLE status.</p>	<p>2 hours</p> <p><u>OR</u></p> <p>24 hours if Division III DG is inoperable</p>
<p>G. Required Action and Associated Completion Time of Condition A, B, C, D, E or F not met.</p>	<p>G.1 -----NOTE----- LCO 3.0.4.a is not applicable when entering MODE 3. -----</p> <p>Be in MODE 3.</p>	<p>12 hours</p>
<p>H. Three or more required AC sources inoperable.</p>	<p>H.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each required offsite circuit.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.2 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. <p>-----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <ol style="list-style-type: none"> a. For DG 1A and DG 1B, steady state voltage ≥ 3740 V and ≤ 4368 V and frequency ≥ 58.8 Hz and ≤ 60.2 Hz. b. For DG 1C: <ol style="list-style-type: none"> 1. Maximum of 5400 V, and 66.75 Hz, and 2. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 60.2 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by, and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7 <p>-----</p> <p>Verify each DG operates for ≥ 60 minutes at a load ≥ 3050 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2525 kW and ≤ 2600 kW for DG 1C.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.4</p> <p>Verify each day tank contains ≥ 316.3 gal of fuel oil.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.5</p> <p>Check for and remove accumulated water from each day tank.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.6</p> <p>Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.7</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby conditions and achieves:</p> <p>a. For DG 1A and DG 1B:</p> <ol style="list-style-type: none"> 1. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and 2. Steady state voltage ≥ 3740 V and ≤ 4368 V and frequency ≥ 58.8 Hz and ≤ 60.2 Hz. <p>b. For DG 1C:</p> <ol style="list-style-type: none"> 1. Maximum of 5400 V, and 66.75 Hz, and 2. In ≤ 13 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and 3. Steady state voltage ≥ 3740 V and ≤ 4580 V and frequency ≥ 58.8 Hz and ≤ 60.2 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.8</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. 2. SR 3.8.1.8.b is only required to be met if 22 kV onsite circuit is supplying Division III safety related bus E22-S004 from normal power transformer STX-XNS1C. <p>-----</p> <p>Verify, for required unit power supplies:</p> <ol style="list-style-type: none"> a. Manual transfer of unit power supply from the normal offsite circuit to required alternate offsite circuit; and b. Automatic transfer of bus E22-S004 through NNS-SWG1A or NNS-SWG1B from the 22 kV onsite circuit to required offsite circuit. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.9</p> <p>-----NOTE-----</p> <ol style="list-style-type: none"> 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9 <p>-----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post accident load and following load rejection, the engine speed is maintained less than nominal plus 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is lower.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.10 -----NOTE----- Credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 4784 V for DG 1A and DG 1B and ≤ 5400 V for DG 1C during and following a load rejection of a load ≥ 3050 kW and ≤ 3130 kW for DGs 1A and 1B and ≥ 2525 kW and ≤ 2600 kW for DG 1C.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and 	<p>In accordance with the Surveillance Frequency Control Program</p> <p style="text-align: right;">(continued)</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 (continued)</p> <p>c. DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage <ol style="list-style-type: none"> i. for DG 1A and DG 1B ≥ 3740 V and ≤ 4368 V, ii. for DG 1C ≥ 3740 V and ≤ 4580 V 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 60.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1 or 2. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. For DG 1C during the auto-start maintains voltage ≤ 5400 V and frequency ≤ 66.75 Hz; b. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C after auto-start and during tests, achieves voltage ≥ 3740 V and frequency ≥ 58.8 Hz. c. Achieves steady state voltage <ol style="list-style-type: none"> 1. For DG 1A and DG 1B ≥ 3740 V and ≤ 4368 V, 2. For DG 1C ≥ 3740 V and ≤ 4580 V, and 3. For DG 1A, 1B, and 1C, frequency of ≥ 58.8 and ≤ 60.2 Hz; and d. Operates for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. ----- Verify each DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; and b. Generator differential current. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.14 -----NOTES----- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. Credit may be taken for unplanned events that satisfy this SR. ----- Verify each DG operating at a power factor ≤ 0.9, operates for ≥ 24 hours:</p> <ul style="list-style-type: none"> a. For DG 1A and DG 1B loaded ≥ 3050 kW and ≤ 3130 kW; and b. For DG 1C: <ul style="list-style-type: none"> 1. For ≥ 2 hours loaded ≥ 2750 kW and ≤ 2850 kW, and 2. For the remaining hours of the test loaded ≥ 2525 kW and ≤ 2600 kW. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.15</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 3050 kW and ≤ 3100 kW for DG 1A and DG 1B, and ≥ 2525 kW and ≤ 2600 for DG 1C, or operating temperatures have stabilized, which ever is longer. <p>Momentary transients outside of the load range do not invalidate this test.</p> <ol style="list-style-type: none"> 2. All DG starts may be preceded by an engine prelube period. <p>-----</p> <p>Verify each DG starts and achieves:</p> <ol style="list-style-type: none"> 1. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C voltage ≥ 3740 V and frequency ≥ 58.8 Hz, and 2. Steady state voltage <ol style="list-style-type: none"> a) For DG 1A and DG 1B ≥ 3740 V and ≤ 4368 V b) For DG 1C ≥ 3740 V and ≤ 4580 V and c) For DG 1A, 1B, and 1C frequency ≥ 58.8 Hz and ≤ 60.2 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each DG:</p> <ul style="list-style-type: none"> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.17 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by:</p> <ul style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency loads from offsite power. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.18 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify sequence time is within $\pm 10\%$ of design for each load sequencer timer.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19</p> <p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. (Not applicable to DG 1C) However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions I and II; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C, 2. energizes auto-connected emergency loads, 3. achieves steady state voltage <ol style="list-style-type: none"> i. for DG 1A and DG 1B ≥ 3740 V and ≤ 4368 V, ii. for DG 1C ≥ 3740 V and ≤ 4580 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 60.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.20</p> <p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify, when started simultaneously from standby condition, each DG achieves:</p> <ol style="list-style-type: none"> 1. In ≤ 10 seconds for DG 1A and DG 1B and ≤ 13 seconds for DG 1C voltage ≥ 3740 V and frequency ≥ 58.8 Hz, and 2. Steady state voltage <ol style="list-style-type: none"> a) For DG 1A and DG 1B ≥ 3740 V and ≤ 4368 V, b) For DG 1C ≥ 3740 V and ≤ 4580 V, and c) For DG 1A, 1B, and 1C a frequency ≥ 58.8 Hz and ≤ 60.2 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>