

Susquehanna Steam Electric Station LOC-23 NRC

RO Written Examination

Applicant Information

Name:

Date:

Facility/Unit: Susquehanna 1/2

Region:

I II III IV Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

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

Applicant Certification

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

Applicant's Signature

Results

Examination Value _____ 75 _____ Points

Applicant's Score _____ Points

Applicant's Grade _____ Percent

(NRC's copy)

PPL SUSQUEHANNA, LLC STANDARD EXAM SHEET

Course #: _____ Course: LOC-23 NRC Written (RO)

First Name: _____ Last Name: _____ Employee #: _____

Social Security Number

0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9

Test Form

A	B	C	D
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Test Date: / /

Test Series: _____

Test Number: _____

Test Taking is an Individual Effort: Any test misconduct is a violation of the Academic Honesty Policy (NTP-QA-14.2) and the PPL Corp. Standards of Conduct and Integrity.

Signature: _____

Correct

% Score

1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	21. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	41. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	61. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	81. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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11. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	31. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	51. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	71. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	91. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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13. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	33. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	53. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	73. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	93. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
14. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	34. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	54. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	74. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	94. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
15. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	35. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	55. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	75. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	95. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
16. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	36. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	56. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	76. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	96. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
17. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	37. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	57. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	77. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	97. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
18. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	38. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	58. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D <input type="radio"/> E	78. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	98. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
19. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	39. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	59. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	79. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	99. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
20. <input checked="" type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	40. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input checked="" type="radio"/> D <input type="radio"/> E	60. <input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	80. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	100. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E

FORM NO. O-104265-PPL

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SSES LOC-23 NRC Exam

SRO Written Examination

Applicant Information

Name:

Date:

Facility/Unit: SSES

Region: I II III IV

Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

Applicant's Signature

Results

RO/SRO-Only/Total Examination Values 75 / 25 / 100 Points

Applicant's Scores _____ / _____ / _____ Points

Applicant's Grade _____ / _____ / _____ Percent

(NRC's copy)

PPL SUSQUEHANNA, LLC STANDARD EXAM SHEET

Course #: _____ Course: LOC-23 NRC Written (SRO)

First Name: _____ Last Name: _____ Employee #: _____

Social Security Number

		+	+				
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

Test Form

A	B	C	D
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Test Date: ____ / ____ / ____

Test Series: _____

Test Number: _____

Test Taking is an Individual Effort: Any test misconduct is a violation of the Academic Honesty Policy (NTP-QA-14.2) and the PPL Corp. Standards of Conduct and Integrity.

Signature: _____

Correct

% Score

1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	21. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	41. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	61. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	81. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
2. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	22. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	42. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	62. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	82. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
3. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	23. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	43. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	63. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	83. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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5. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	25. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	45. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	65. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	85. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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8. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	28. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	48. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	68. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	88. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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11. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	31. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	51. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	71. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E	91. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D <input type="radio"/> E
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Susquehanna Learning Center
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January 12, 2011

Mr. John Caruso
USNRC Chief Examiner
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Susquehanna Learning Center
Examination Materials
PLA 006687 File A14-13D

Dear Mr. Caruso:

Enclosed for your review and approval are Proposed Examination Materials for the PPL Susquehanna, LLC Initial Licensed Operator Examination scheduled to begin January 18, 2011. These materials are submitted in accordance with NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 9). The following materials are enclosed:

- **RO Written Outline**
 - Form ES-401-1, BWR Examination Outline – RO – Rev. 4
 - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – RO – Rev. 4
- **SRO Written Outline**
 - Form ES-401-1, BWR Examination Outline – SRO – Rev. 4
 - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – SRO – Rev. 4
- Form ES-401-4, Record Rejected K/As – Rev. 4
- Form ES-401-6, Written Examination Quality Checklist
- 100 Written Examination Questions and Answers

All proposed Examination Materials have been validated by Licensed Operator personnel in accordance with the guidance provided within NUREG 1021, Operator Licensing Examination Standards for Power Reactors, Revision 9.

We request these materials be withheld from public disclosure until after the completion of the examination. If you have any questions, please feel free to contact me at 570-542-3677, or Paul Moran at 570-542-1891.

Sincerely,



R. E. Klinefelter
Assistant Operations Manager – Shift Ops

Response: No

Enclosures: Listed

cc: J. M. Diltz
M. H. Crowthers
Ops Letter File - Electronic
Nuc Records – Vault – NUCSA1

exam materials – 01-12-11

REK/PJM/vah

QUESTION 1

Both Units are operating at full power.

The electrical distribution system is in a normal full power line up, EXCEPT that breaker 2A20109, Alternate Supply to ESS bus 2A, is INOPERABLE and is RACKED OUT for maintenance.

Breaker 0A10306, Startup Bus 10 feeder to XFMR-101, then TRIPS UNEXPECTEDLY due to a breaker mechanism failure.

Which one of the following describes the response (if any) to this breaker failure?

- A.
 - ESS Bus 1A will REMAIN ENERGIZED from its NORMAL supply;
 - ESS Bus 2A will be RE-ENERGIZED from Diesel Generator A when the DG exceeds 540 RPM and 90% rated voltage.

- B.
 - ESS Bus 1A will be RE-ENERGIZED from its ALTERNATE supply;
 - ESS Bus 2A will REMAIN ENERGIZED from its NORMAL supply.

- C.
 - ESS Bus 1A will REMAIN ENERGIZED from its NORMAL supply;
 - ESS Bus 2A will REMAIN ENERGIZED from its NORMAL supply.

- D.
 - ESS Bus 1A will be RE-ENERGIZED from its ALTERNATE supply;
 - ESS Bus 2A will be RE-ENERGIZED from Diesel Generator A when the DG exceeds 540 RPM and 90% rated voltage.

K&A # 264000 K1.01
Importance Rating 3.8

QUESTION 1

RO Tier 2 Group 1

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between EMERGENCY GENERATORS (DIESEL/JET) and the following: A.C. electrical distribution

Justification:

- A. Incorrect, Bus 1A will auto transfer to its alternate supply, S/U bus 20 when its normal supply, bus 10 is de-energized by the breaker failure. Candidates may select this if they understand that bus 2A will be energized by DG A after it reaches rated speed and voltage, but fail to correctly recall the normal and alternate supplies to bus 1A.
- B. Incorrect, the normal supply to both busses 1A and 2A is lost when S/U bus 10 de-energizes. Candidates may select this if they do not recognize that the normal power supply to bus 2A is lost.
- C. Incorrect, the normal supply to both busses 1A and 2A is lost when S/U bus 10 de-energizes. Candidates may select this if they do not recognize that the normal power supply to busses 1A and 2A is lost.
- D. **Correct, per TM-OP-004, the following conditions are required to be met in order for DG A to ESS 2A breaker 2A20104 to auto close:**
 - **ESS bus voltage <20% for 0.5 sec**
 - **Preferred source breaker 2A20101 open**
 - **Alternate source breaker 2A20109 open**
 - **30 cycle time delay**
 - **Bus 2A lockout reset**
 - **DG > 540 rpm, >90% voltage**

Since the alternate supply is inop, and the normal supply will open when the ESS 2A bus load shed and DG A auto start begins due to the <20% for 0.5 sec signal, the closure of 2A20104 will occur after the DG is >540 RPM and >90% voltage.

Bus 1A alternate supply from S/U bus 20 is still available, and will close in and re-energize bus 1A after bus voltage is lost.

K/A Match Justification:

This question matches the stated K/A since candidates must determine that normal and alternate supplies to bus 2A are lost and recall diesel generator start and load sequences following loss of voltage to bus 2A.

References: TM-OP-004 rev 2

Reference Required none

Learning Objective: 10541.a

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)8

Comments: Created by: T. North, 9/6/10

Reviewed by: M. Jacopetti 01/04/11

QUESTION 2

Unit 1 was at 50 % power when a Loss of Offsite Power occurred. After plant conditions have stabilized, the following conditions exist:

- HPCI is in service for RPV pressure control.
- RCIC is in service for RPV level control.

A steam leak then occurs on the HPCI steam supply line raising temperature in the HPCI pipe routing area to 196 °F in approximately 1 (one) minute, then eventually stabilizing at this temperature.

Which one of the following correctly identifies the status of HPCI AND RCIC 20 minutes later, with NO operator action?

- A. HPCI isolated after a 1 second time delay. RCIC will continue to operate indefinitely.
- B. HPCI AND RCIC will BOTH continue to operate indefinitely.
- C. HPCI AND RCIC BOTH isolated after a 15 minute time delay.
- D. HPCI isolated after a 15 minute time delay. RCIC will continue to operate indefinitely.

K&A # 223002 K1.07
Importance Rating 3.4

QUESTION 2

RO Tier 2 Group 1

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF and the Reactor core isolation cooling; Plant-Specific

Justification:

- A. Incorrect, HPCI isolated after 15 minute TD for a high temp in the pipe routing area, and RCIC will also isolate following a HPCI leak in the shared pipe routing area. The 15 minute time delay is applicable only for the pipe routing area isolation signal. Candidates may select this if they incorrectly recall the isolation setpoint for the shared pipe routing area, and that RCIC will also isolate with a steam leak in the shared area.
- B. Incorrect, HPCI and RCIC will both isolate. Candidates may select this if they incorrectly recall the isolation setpoint for the shared pipe routing area, and that RCIC will also isolate with a steam leak in the shared area.
- C. **Correct, HPCI and RCIC share a common pipe routing area, and the isolation setpoint for both HPCI and RCIC is 167°F after a 15 minute time delay. Engineering evaluation determined that for a HPCI leak in this area, RCIC would also isolate.**
- D. Incorrect, RCIC will also isolate following a HPCI leak in the shared pipe routing area. Candidates may select this if they incorrectly recall that RCIC will also isolate with a steam leak in the shared area.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between Steam leak detection isolation setpoints and the RCIC system.

References: TM-OP-059B rev 5 Reference Required none

Learning Objective: 2120.b, 2123.o

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP059B/2120 004

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 55. 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/04/11

QUESTION 3

A fault occurs in 250 VDC Switchgear 1D662, causing the battery charger output breaker to trip and the fuse to the battery to blow.

Which of the following loads would be affected by this event?

- A. Main Generator Emergency Seal Oil Pump
- B. HPCI Auxiliary Oil Pump
- C. Reactor Feed Pump 1B Emergency Lube Oil Pump
- D. RCIC Barometric Condenser Vacuum Pump

K&A # 263000 K2.01

Importance Rating 3.1

QUESTION 3

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: Major D.C. loads

Justification:

- A. Incorrect, Emergency Seal oil pump is powered from 250vdc control center 1D155 via 1D652. The candidate may select this if they confuse the ESOP with the main turbine emergency oil pump which is powered by 1D274/1D662
- B. Correct, the HPCI aux oil pump is powered from 1D662 via HPCI control center 1D274 breaker 31**
- C. Incorrect, RFP 1B emergency oil pump is powered from 250vdc control center 1D155 via 1D652. The candidate may select this because RFP 1A emergency oil pump is powered from 1D274/1D662
- D. Incorrect, powered by 250 VDC Control Center 1D254 via 1D652. The candidate may select this if they confuse HPCI and RCIC 250 vdc power supplies.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of power supplies to major 250 VDC oil pumps.

References: TM-OP-088-FS rev 00, ON-188-001att Reference Required none
B rev 11

Learning Objective: 1383

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP088/1393 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by:
Reviewed by: M. Jacopetti 01/04/11

QUESTION 4

Unit 1 is operating in MODE 2 with ALL Intermediate Range Monitor (IRM) detectors fully inserted into the core.

Which one of the following power supplies, IF LOST, will result in IRM channels A, C, E, and G UNABLE to accurately indicate neutron flux on ANY control room indicator?

- A. 120 VAC Panel 1Y216.
- B. 120 VAC Panel 1Y218.
- C. 24 VDC Bus 1D682.
- D. 24 VDC Bus 1D672.

K&A # 215003 K2.01

Importance Rating 2.5

QUESTION 4

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: IRM channels/detectors

Justification:

- A. Incorrect, 1Y216 does not power any IRM system components. Candidates may select this if they cannot correctly recall power supplies to IRMs.
- B. Incorrect, 1Y218 powers the IRM detector drive motors and recorders. Since the detectors are fully inserted, loss of this power will not affect the channel's ability to indicate flux. Flux can be accurately determined at the individual IRM channel indicators, and using PICSY displays. Candidates may select this if they cannot correctly recall power supplies to IRM components required for accurate flux indication.
- C. Incorrect, this power supply feeds the div II IRMs, B, D, F, H. Candidates may select this if they cannot correctly recall power supplies to IRMs.
- D. **Correct, this power supply feeds the div I IRMs, A, C, E, G and its loss will result in these channels being completely de-energized and unable to indicate neutron flux.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall power supplies to various IRM detector and channel components and determine the effect on IRM indication.

References: ON-117-001 rev 30, TM-OP-078B rev 6 Reference Required none

Learning Objective: 10230

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 11/14/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 5

Unit 1 was operating at full power when a loss of all Reactor Feed Pumps occurred. The High Pressure Coolant Injection (HPCI) system automatically started and injected due to low RPV water level.

- HPCI is injecting to the RPV at 4000 gpm
- RPV level is +20', steady
- RPV pressure is 934 psig, controlled with turbine bypass valves

A logic relay failure causes the HPCI Minimum Flow Isolation valve, HV-155-F012, to fully open.

Determine the impact of this failure on Suppression Pool water level if HPCI were to remain in its current line up:

(consider ONLY the effect of the HPCI line up)

Suppression Pool water level will...

- A. REMAIN UNCHANGED because Suppression Pool water will be short-cycled back to the Suppression Pool.
- B. REMAIN UNCHANGED because Condensate Storage Tank water will be short-cycled back to the Condensate Storage Tank.
- C. RISE because Condensate Storage Tank water will be diverted to the Suppression Pool.
- D. LOWER because Suppression Pool water will be diverted to the Condensate Storage Tank.

K&A # 206000 K3.03
Importance Rating 3.4

QUESTION 5

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the HIGH PRESSURE COOLANT INJECTION SYSTEM will have on following: Suppression pool level control: BWR-2,3,4

Justification:

- A. Incorrect, level will rise. Normal suction path is from the CST. Candidates may select this if they incorrectly recall the normal HPCI suction path.
- B. Incorrect, level will rise. Min flow line directs water to the SP. Candidates may select this if they incorrectly recall the flow path of the HPCI min flow line.
- C. **Correct. HPCI normal suction path is from the CST. If the min flow valve were to open with HPCI injecting to the RPV at 4000 gpm, CST water will be diverted to the SP causing SP level to rise.**
- D. Incorrect, the normal suction path is NOT from the SP, and the min flow line directs water to the SP, NOT the CST. Candidates may select this if they incorrectly recall the normal HPCI suction path and min flow line path.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of a failure of the HPCI minimum flow line on suppression pool water level.

References: TM-OP-052 ST & PG, rev 4 Reference Required none

Learning Objective: 2035.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 7/30/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 6

Unit 1 is operating at full power when the "A" End of Cycle Recirc Pump Trip (EOC-RPT) logic circuit fails.

- The "A" EOC-RPT trip system is declared inoperable because it is not capable of generating the required trip signal to the recirc system.

Predict the impact of this failure if a valid EOC-RPT trip condition occurs:

- A. BOTH recirc pumps will trip because the "B" EOC-RPT trip system will trip ONE RPT breaker for each recirc pump.
- B. ONLY the "B" recirc pump will trip because the "B" EOC-RPT trip system trips BOTH RPT breakers for just the "B" pump.
- C. NEITHER recirc pump will trip because each RPT breaker requires input from BOTH the "A" and "B" EOC-RPT trip systems to function.
- D. BOTH recirc pumps will trip because the "B" EOC-RPT trip system will trip BOTH RPT breakers for each recirc pump.

K&A # 212000 K3.11
Importance Rating 3.0

QUESTION 6

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the REACTOR PROTECTION SYSTEM will have on following: Recirculation system

Justification:

- A. **Correct, each EOC-RPT trip system operates independently by opening an RPT breaker in each recirc pump.**
- B. Incorrect, both pumps will trip, and the trip signal is applied to the RPT breakers, not the drive motor breaker. Candidates may select this if they believe that the B logic trips the B pump and the A logic trips the A pump.
- C. Incorrect, both pumps will trip. Candidates may select this if they believe that the EOC-RPT logic is arranged like RPS which requires signals from both trip systems to function.
- D. Incorrect, the B EOC-RPT logic is applied to only one RPT breaker in each pump. The A logic is applied to the other RPT breaker in each pump. Candidates may select this if they believe the B and A logics are redundant and are applied to both breakers in both pumps.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between the EOC-RPT function of RPS, and determine the effect of a failure of that function on the reactor recirc pump breakers.

References: TM-OP-064C rev 10, TM-OP-058 rev 9 Reference Required none

Learning Objective: 2526.aa

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 12/22/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 7

Unit 1 is operating in single loop with the "A" recirc loop in operation.

ALL required actions have been taken for single loop operation

Based on these conditions, what is the APRM Simulated Thermal Power (STP) UPSCALE TRIP setpoint?

- per telcom 1/24/11*
- A. $.55W - 8.7) + 54.2$, clamped at 118%
 - B. $.55W - 8.7) + 58.7$, clamped at 113.5%
per telcom 1/24/11
 - C. $.55W + 54.2$, clamped at 118%
 - D. $.55W + 58.7$, clamped at 113.5%

K&A # 215005 K4.07

Importance Rating 3.7

QUESTION 7

RO Tier 2 Group 1

K&A Statement:

Knowledge of AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following: Flow biased trip setpoints

Justification:

- A. Incorrect, the setpoint is "+58.7" and is clamped at 113.5. Candidates may select this if they confuse the upscale alarm setpoint with the trip setpoint and do not recall the clamped value.
- B. Correct, when in SLO, the normal STP trip setpoint of .55w+58.7 is modified by subtracting ΔW (8.7)**
- C. Incorrect, the setpoint is "+58.7", is clamped at 113.5 and is modified for SLO by "-8.7". Candidates may select this if they confuse the upscale alarm setpoint with the trip setpoint, do not recall the clamped value or the SLO value.
- D. Incorrect, the normal scram setpoint is modified by $-\Delta W$ (8.7) for SLO. Candidates may select this if they do not correctly recall the SLO modifier value.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the APRM flow biased trip setpoint for the given flow conditions.

References: TM-OP-078D rev 6 Reference Required none
TRM Table 2.-1 (2.2.1.4 b)

Learning Objective: 15710.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 5/20/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 8

Unit 1 is shutdown following an automatic scram with the following conditions present:

- RPV pressure is 900 psig, steady
- RPV level is +25 inches, up slow
- RCIC is injecting to the RPV at 600 gpm with the RCIC flow controller in AUTOMATIC

The PCOP then adjusts the RCIC flow controller setpoint thumbwheel to 60 gpm.

Which one of the following describes the RCIC system response:

TOTAL RCIC pump flow will be...

- A. 60 gpm with ALL flow injecting to the RPV.
- B. 75 gpm with ALL flow filling the Suppression Pool.
- C. 135 gpm; with 60 gpm injecting to the RPV, AND 75 gpm returning to the Condensate Storage Tank.
- D. 135 gpm; with 60 gpm injecting to the RPV, AND 75 gpm filling the Suppression Pool.

K&A # 217000 K4.03

Importance Rating 2.9

QUESTION 8

RO Tier 2 Group 1

K&A Statement:

Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following: Prevents pump over heating

Justification:

- A. Incorrect, the min flow valve will open when flow drops below 70 gpm. The flow controller will continue to ensure 60 gpm injecting, but the min flow valve will be open and 75 gpm will go to the SP. The candidate may select this if they do not recall the correct min flow valve setpoint.
- B. Incorrect, the flow controller will still adjust RCIC speed to make injection flow 60 gpm. The candidate may select this if they believe that ALL pump flow will go to the SP.
- C. Incorrect, the minimum flow line will direct flow to the Supp Pool, not the CST. Candidates may select this if they confuse the min flow line with the RCIC test return line that returns to the CST.
- D. **Correct, the min flow valve will automatically open when pump flow is reduced below 75 gpm. The flow controller will continue to maintain RCIC pump speed such that RPV injection flow is stabilized 60 gpm regardless of bypass flow through the min flow line, The min flow line orifices will maintain flow to the supp pool at approximately 75 gpm by design.**

K/A Match Justification:

This question matches the stated K/A since the candidates are required to recall facts regarding automatic operation of the min flow isolation valve, the design flowrate of the min flow line, and that the min flow line flow is not sensed by the RCIC flow element. The purpose of establishing flow in this min flow line is to prevent RCIC pump overheating when pump flow is reduced below a certain value.

References: TM-OP-050 rev 4

Reference Required none

Learning Objective: 2008.i, 2018.c, 2012.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 12/22/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 9

During a Unit 1 reactor startup, the ROD OUT BLOCK Annunciator alarms. The following neutron monitoring conditions exist:

- SRMs A and B Fully Inserted, reading 8×10^4 cps.
- SRMs C and D Partially withdrawn, reading 60 cps.
- Reactor Period +200 seconds.
- IRMs Fully inserted, reading 4 on Range 1.

What one of the following actions will clear the ROD OUT BLOCK condition and permit continued rod withdrawal?

The ROD OUT BLOCK will clear if...

- A. SRM Detectors C and D are driven in until they indicate greater than 100 cps.
- B. a control rod is inserted until A and B count rates are less than 1×10^4 cps.
- C. power is allowed to continue to rise until the IRMs indicate above 5 on Range 1.
- D. SRM Detectors A and B are driven out until count rate is less than 1×10^3 cps.

K&A # 215004 K5.01

Importance Rating 2.6

QUESTION 9

RO Tier 2 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SOURCE RANGE MONITOR (SRM) SYSTEM : Detector operation

Justification:

- A. **Correct. The retract permit rod block is causing the condition.**
- B. Incorrect. High count rate is 2E5. Candidates may select this if they do not correctly recall SRM rod block setpoints.
- C. Incorrect. The IRM downscale is bypassed on Range 1, SRM Retract permit is bypassed @ Range 3. Candidates may select this if they do not correctly recall SRM retract permit logic.
- D. Incorrect. High count rate is 2E5. Candidates may select this if they do not correctly recall SRM rod block setpoints.

K/A Match Justification:

This question matches the stated K/A since candidates must recall how SRM detector operation impacts plant operation.

References: TM-OP-078A rev 3

Reference Required none

Learning Objective: 10026

Question source: SSES OPS_INITIAL_LICENSE
Bank # TMOP078A/10026 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by:
Reviewed by: M. Jacopetti 01/04/11

QUESTION 10

Unit 1 is operating at full power when the Containment Instrument Gas (CIG) compressor suction filter becomes completely plugged, resulting in compressor suction pressure dropping below 5 psia.

Which one of the following describes the impact of this condition?

- A. The running CIG compressor will automatically unload, and the STANDBY CIG compressor will auto start and load with NO interruption to CIG loads.
- B. The running CIG compressor will trip, and the STANDBY CIG compressor will auto start with NO interruption to CIG loads.
- C. BOTH CIG compressors will receive a trip signal, and control of SRVs, MSIVs, and ADS valves will be lost until CIG can be cross-tied to instrument air.
- D. BOTH CIG compressors will receive a trip signal, but will NOT IMMEDIATELY interrupt control of CIG loads due to the backup gas bottles and accumulators.

K&A # 300000 K5.13
Importance Rating 2.9

QUESTION 10

RO Tier 2 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to the INSTRUMENT AIR SYSTEM: Filters

Justification:

- A. Incorrect, both compressors receive a trip signal since both share a common suction filter. The running CIG compressor will only shift to unloaded mode when discharge pressure rises indicating decreasing system load. Candidates may select this if they believe that CIG compressors have individual suction filters such as instrument air compressors, and that low suction pressure will cause a compressor to unload rather than trip.
- B. Incorrect, the standby compressor also receives a trip signal since the suction filter is common to both compressors. Candidates may select this if they believe that CIG compressors have individual suction filters such as instrument air compressors.
- C. Incorrect, control of MSIVs and SRVs will not be immediately impacted. Candidates may select this if they do not correctly evaluate the impact of low CIG pressure resulting from compressor trip.
- D. **Correct: the compressors will trip on low suction pressure, and the backup gas bottles and accumulator will automatically charge the 150# and 90# headers respectively, resulting in no immediate loss of component control.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of CIG filter failure on plant operation.

References: ON-125-001 rev 12 Reference Required none

Learning Objective: 1595.c, 1592.m

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)5

Comments: Created by: T. North, 12/15/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 11

Unit 1 is in MODE 3; Unit 2 is in MODE 1.

A ground fault occurs on 0B516, "DIESEL GENERATOR 'A' ESS 480V MOTOR CONTROL CENTER".

Which one of the following statements describes the effect of the above condition?

- A. Unit 1 is NOT affected;
Unit 2 Battery Charger 2D613 transfers to its alternate AC source.
- B. Unit 2 is NOT affected;
Unit 1 Battery Charger 1D613 de-energizes, and battery 1D610 will carry the DC loads.
- C. Unit 1 AND Unit 2 Battery Chargers 1D613 AND 2D613 are BOTH lost and batteries 1D610 and 2D610 will carry the DC loads.
- D. Unit 1 AND Unit 2 Battery Chargers 1D613 AND 2D613 BOTH transfer to their alternate AC source.

K&A # 263000 K6.01

Importance Rating 3.2

QUESTION 11

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the following will have on the D.C. ELECTRICAL DISTRIBUTION : A.C. electrical distribution

Justification:

- A. Incorrect, Both unit 1 and 2 battery chargers are affected. There is no alternate source of AC power for these battery chargers. Portable battery charger 0D101 must be manually aligned to provide an alternate power to batteries. Candidates may select this if they do not correctly recall the physical arrangement of chargers 1D613 and 2D613.
- B. Incorrect, Both unit 1 and 2 battery chargers are affected. Candidates may select this if they do not recall that 0B516 supplies both chargers.
- C. **Correct, 0B516 is the AC supply to BOTH unit 1 and 2 battery chargers. With 0B516 de-energized, both unit's DC loads supplied by 2D610 and 1D610 will be supplied by their respective batteries. The batteries are rated for 4 hours.**
- D. Incorrect, there is no alternate source of AC power for these battery chargers. Portable battery charger 0D101 must be manually aligned to provide an alternate power to batteries. Candidates may select this if they do not correctly recall the physical arrangement of chargers 1D613 and 2D613.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the physical connections and relationship between DC battery chargers and their AC power source, and determine the effect of the loss of the AC supply on those battery chargers and the associated DC loads.

References: TM-OP-002 rev 5; ON-104-201 rev 13 Reference Required none

Learning Objective: 1431.a

Question source: SSES OPS_INITIAL_LICENSE
Bank # TMOP002/1431 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/04/11

QUESTION 12

Unit 1 is in MODE 2 with a startup in progress:

- Reactor power is 1%
- Reactor pressure is 300 psig.
- Core Spray (CS) Initiation Logic Channel A has experienced a loss of power from 125 VDC Class 1E Bus A (1D614)

If a valid High Drywell pressure condition were to occur, which one of the following describes how CS pumps respond?

- A. ONLY B and D pumps start because logic channel B can independently initiate the B CS loop.
- B. ONLY A and B pumps start because logic channel B can independently start one pump in each CS loop.
- C. ALL 4 pumps start because logic channel B can independently initiate both CS loops.
- D. ALL 4 pumps remain OFF because BOTH logic channels are required to initiate each CS loop.

K&A # 209001 K6.04

Importance Rating 2.8

QUESTION 12

RO Tier 2 Group 1

K&A Statement:

Knowledge of the effect that a loss or malfunction of the following will have on the LOW PRESSURE CORE SPRAY SYSTEM :
D.C. power

Justification:

- A. **Correct, Only the div 2 pumps start because the B logic has power and can only provide start signals to B loop pumps. Loop A pumps will not start without power to the A initiation logic.**
- B. Incorrect, Only the loop B pumps receive start signals. Candidates may select this if they do not correctly recall the core spray logic arrangement.
- C. Incorrect, see above. Candidates may select this if they confuse the Core Spray logic arrangement with RHR.
- D. Incorrect, see above

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate the failure of DC power to core spray logic and determine the resultant effect following a LOCA signal.

References: TM-OP-051 ST & PG rev 2; Reference Required none
E156-sh 1 rev 21, -sh 2 rev 21, -sh 3
rev 26, -sh 4 rev 25

Learning Objective: 2093.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 7/30/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 13

Unit 1 is in the process of a plant startup after a refueling outage.

- Containment inerting is in progress using "A" Train of Standby Gas Treatment (SGTS)
- "A" SGTS is running and is aligned to take suction from Unit 1 Primary Containment only.
- Oxygen concentration is 20% and going down slowly.

A malfunction in the Unit 1 PCIS logic causes a false RB Zone 3 Isolation Signal on a -38" reactor water level signal to be initiated. The "A" SGTS system responds as designed.

Based on this malfunction, what is the resultant effect on the oxygen concentration in Primary Containment?

Primary Containment oxygen concentration will:

- A. RISE due to the increased flow due to the automatic start of the "B" SGTS Train.
- B. continue to LOWER but at a slower rate because the Nitrogen supply valves (SV-15767 & SV-15789) remain open.
- C. LOWER faster due to the resulting automatic rise in "A" SGTS system flow caused by the zone 3 isolation signal.
- D. remain CONSTANT because the primary containment suction dampers (HD17508A & B) closed.

K&A # 261000 A1.05
Importance Rating 2.7

QUESTION 13

RO Tier 2 Group 1

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the STANDBY GAS TREATMENT SYSTEM controls including: Primary containment oxygen level: Mark-I&II

Justification:

- A. Incorrect, O2 levels will remain constant. The "B" SGTS train will not start, and this would not cause increased flow from PC. Candidates may select this if they do not correctly recall SGTS response to a -38" signal.
- B. Incorrect, SGTS will no longer take suction from PC and the N2 supply valves isolate at -38". If N2 supply valves remain open following the isolation signal they may continue to supply nitrogen to the PC atmosphere, even though SGTS is no longer removing oxygen. This could result in O2 concentration dropping at a slower rate. However, the N2 supply valves DO in fact shut on this isolation signal, and candidates must recall this to rule out this distracter.
- C. Incorrect, SGTS flow will not affect O2 levels since PC suction dampers are closed. Candidates may select this if they do not correctly recall SGTS response to a -38" signal.
- D. **Correct, the -38" isolation signal will cause the PC purge dampers and N2 supply valves to close, resulting in SGTS no longer drawing on the PC and no additional N2 being added. O2 levels will remain constant.**

K/A Match Justification:

This question matches the stated K/A since candidates must predict changes in oxygen levels following a re-alignment of SGTS during de-inerting activities.

References: TM-OP-070 rev 5, OP-173-001 rev 37, Reference Required none
ON-159-002 att B rev 29

Learning Objective: 1985.j / 1991.a

Question source: INPO exam bank # 23535

Question History: Columbia station 2003 NRC exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Modified by: Bank
Reviewed by: M. Jacopetti 01/04/11

QUESTION 14

Unit 1 has experienced a LOCA concurrent with a loss of high pressure injection sources. The following conditions are present:

- RPV water level is -135", down slow
- RPV pressure is 440 psig, down slow
- Drywell pressure is 7.5 psig, up slow

Which one of the following is true regarding the LPCI system under these conditions?

- A.
 - All LPCI injection valves are currently open;
 - Injection will begin when the testable check valves, F050A and B, open at approximately 420 psig.
- B.
 - LPCI injection valves F015A and B are shut and will open when pressure drops to 420 psig;
 - Injection will begin when the testable check valves F050A and B open when RPV pressure reaches LPCI pump shutoff head.
- C.
 - LPCI injection valves F015A and B are shut;
 - Injection will begin when testable check valves, F050A and B, and F015A and B all open when pressure drops to 420 psig.
- D.
 - All LPCI injection valves are currently open;
 - Injection will begin when the testable check valves, F050A and B, open when RPV pressure reaches LPCI pump shutoff head.

K&A # 203000 A1.02
Importance Rating 3.9

QUESTION 14

RO Tier 2 Group 1

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: INJECTION MODE (PLANT SPECIFIC) controls including: Reactor pressure

Justification:

- A. Incorrect, F015A and B are shut until <420#. F050A and B open when RPV pressure reaches LPCI pump shutoff head (approximately 275-300 psig). Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.
- B. Correct, the LPCI auto initiation setpoint (-129") has been reached, but F015A and B remain closed until <420#. F050A and B remain closed until pressure below LPCI pump shutoff head (approximately 275-300 psig), at which time vessel injection will begin.**
- C. Incorrect, F050A and B will not open until RPV pressure reaches LPCI pump shutoff head. Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.
- D. Incorrect, F015A and B are shut until <420#. Candidates may select this if they do not correctly recall the response of RHR valves during depressurization.

K/A Match Justification:

This question matches the stated K/A since candidates must be able to predict the response of LPCI injection valves during RPV depressurization while in the LPCI injection mode.

References: TM-OP-050 rev 4 Reference Required none

Learning Objective: 196.o

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 5/20/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 15

Unit 2 is operating in MODE 1 when power is lost to 480 VAC Panel 2B236.

An ATWS occurs and the Unit Supervisor directs the PCOP to inject Standby Liquid Control (SBLC).

Which one of the following is CORRECT concerning boron injection?

- A. ONLY SBLC Pump 2A is available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- B. ONLY SBLC Pump 2B is available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- C. BOTH SBLC subsystems are available.
Initiate SBLC per OP-253-001, "Standby Liquid Control System".
- D. NEITHER SBLC subsystem is available.
Implement ES-250-002, "Boron Injection Via RCIC".

K&A # 211000 A2.03

Importance Rating 3.2

QUESTION 15

RO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: A.C. power failures

Justification:

- A. Incorrect, SBLC pump A is powered from 2B236, therefore it will not start if its handswitch is placed in start. Candidates may select this if they do not recall the 480 vac power supply to Unit 2's SLC Pumps.
- B. **Correct, SBLC pump B (2B217) and squib valve A (2Y216) are available for boron injection. Note Unit 2 squib valve power supplies are the reverse of Unit 1 (A from Y236, B from Y216)**
- C. Incorrect, 2B236 is the power supply for A SBLC Pump and 2Y236, which is the power supply to B Squib valve. Therefore, only the B SBLC Pump can inject via the A Squib valve. Candidates may select this if they do not recall the 480/120 vac power supply to Unit 2's SLC Pumps and squib valves.
- D. Incorrect, as stated above, B SBLC Pump is able to inject. Although implementing ES-150-002 would allow the use of RCIC to inject boron, it is only implemented in the event that SBLC can not inject boron. Candidates may select this if they do not recall the 480/120 vac power supply to Unit 2's SLC Pumps and squib valves.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the impact on SBLC due to the loss of 480 vac and 120vac panels powering some SBLC components, AND determine the correct method and procedure required to inject boron with this AC power unavailable.

References: TM-OP-053-ST rev 9, TM-OP-053-FS Reference Required none
rev 2, ON-217-001 Att. H, rev 24

Learning Objective: 1214.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 11/30/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 16

Unit 1 is operating at full power with the following conditions present:

- 1 Feedwater ^{TRANSMITTER *per Hansen 1/24/11 match ON-145 working*} Flow input has been automatically removed from the ICS/DCS total feed flow calculation due to deviation >0.50 Mlbm/hr
- LIC-C32-1R600, FW Level Ctl/Demand Signal Controller, is in AUTOMATIC
- RPV level control is selected to 3 ELEMENT
- RPV level stable at +35"
- NO operator actions have been taken

A SECOND Feedwater Flow input then FAILS DOWNSCALE.

Which one of the following describes:

- (1) The RPV level response (if any), AND;
 - (2) The action(s) that should be taken in accordance with ON-145-001, "RPV Level Control System Malfunction"?
- A. (1) RPV level rises to approximately +42", then stabilizes at approximately +35".
(2) Shift ICS/DCS to SINGLE ELEMENT, then manually bypass the second failed RFP flow input.
- B. (1) RPV level remains stable at approximately +35".
(2) Maintain ICS/DCS in its current configuration and verify that ICS/DCS automatically bypassed the second failed RFP flow input.
- C. (1) RPV level remains stable at approximately +35".
(2) Verify that ICS/DCS automatically shifted to SINGLE ELEMENT control, then manually bypass the second failed RFP flow input.
- D. (1) RPV level rises to approximately +42", then stabilizes several inches ABOVE +35".
(2) Establish manual control of Reactor Feed Pump speeds to return RPV level to +35" until one feedwater flow input can be returned to service.

K&A # 259002 A2.02

Importance Rating 3.3

QUESTION 16

RO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the REACTOR WATER LEVEL CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of any number of reactor feedwater flow inputs

Justification:

- A. Correct: Per ON-145-001, the 2nd failed feed flow transmitter remains in service until manually bypassed. The downscale signal causes an RPV level rise to 42" in response to a potential reduction in level due to lowering total feed flow signal. Level control remains in 3 element, and restore level to 35". The 2nd failed flow instrument must be manually bypassed, and ICS/DCS should be shifted to single element.**
- B. Incorrect, the 2nd failed instrument remains in service and creates a rising level transient; ON-145-001 should be used to transfer level control to single element and manually bypass the 2nd failed feed flow input. Candidates may select this if they incorrectly assume that ICS/DCS will automatically bypass the second failed flow input, RPV level will remain stable, and that level control should remain in 3 element control.
- C. Incorrect, the 2nd failed instrument remains in service and creates a rising level transient. Candidates may select this if they assume that ICS/DCS will automatically shift to single element control and level will remain stable.
- D. Incorrect, Level will return to approximately +35". Level control should be shifted to single element control and the second feed flow input must be manually bypassed. Candidates may select this if they incorrectly assume that ICS/DCS compensate for the lost feed flow input by establishing a higher level setpoint.

K/A Match Justification:

This question matches the stated K/A since candidates must predict plant response to a 2nd failed feed flow instrument and determine the actions required per the stated procedure.

References: ON-145-001 rev 27 Reference Required none

Learning Objective: 16014.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 9/2/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 17

Unit 1 experienced a LOCA and the only injection source is the Engine Driven Fire Pump. This results in the following:

- RPV level is -162", down fast
- RPV pressure is 80 psig, down slow

The NPO directed to open the ADS valves from the Lower Relay Room reports the six ADS keylock switches have been placed in the Open position.

PCOP notes the following conditions:

- RPV pressure is 70 psig, down slow
- Six ADS valve solenoid energized lights on 1C601 are LIT
- NONE of the acoustic monitor LEDs are LIT

The PCOP should report that ...

- A. ADS valves are OPEN and the acoustic monitors are not indicating due to low RPV pressure.
- B. ADS valves WILL NOT open until the Low Pressure ECCS permissive is met.
- C. ADS valves are NOT OPEN because the acoustic monitor LEDs should be illuminated under these conditions.
- D. ADS valve positions CANNOT be determined under current conditions.

K&A # 239002 A3.04

Importance Rating 3.6

QUESTION 17

RO Tier 2 Group 1

K&A Statement:

Ability to monitor automatic operations of the RELIEF/SAFETY VALVES including: Acoustical monitor noise: Plant-Specific

Justification:

- A. **Correct, at low RPV pressure (below approximately 75#) the acoustic monitors indications on 1C690A&B go out. EO-000-112 basis states that solenoid energized lights and RPV pressure not rising is sufficient to determine ADS valves open.**
- B. Incorrect, the Low Pressure ECCS Permissive for the ADS logic is only required when ADS is initiated from the Control Room. Candidates may select this if they do not correctly recall it is not required when the valves are opened from the rely room.
- C. Incorrect, insufficient indication is available to determine that six ADS valves are open. Candidates may select this if they do not correctly recall the operation of the acoustic monitor LEDs.
- D. Incorrect, ADS solenoids energize to open the valves and combined with RPV pressure not rising is sufficient to determine ADS valves open. Candidates may select this if they do not correctly recall the operation of the ADS solenoid valves.

K/A Match Justification:

This question matches the stated K/A since candidates must recall facts regarding acoustic monitors in order to accurately monitor ADS valve operation.

References: EO-000-112 rev 5; TM-OP-083, rev 8 Reference Required none

Learning Objective: 14596

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created / revised by: T. North, 01/11/11
Reviewed by: M. Jacopetti 01/11/11

QUESTION 18

Unit 1 was operating at full power with all systems in a normal full power lineup when a steam leak occurs inside the drywell resulting in:

- Drywell pressure 2.0 psig, up slow
- Drywell temperature 195°F, up slow

In this condition, operators should closely monitor (1) because (2) .

- A. (1) Reactor Recirc Pump (RRP) motor winding temperatures
(2) Reactor Building Closed Cooling Water flow to the RRP motor winding coolers automatically isolated
- B. (1) Reactor Recirc Pump (RRP) motor winding temperatures
(2) RRP motor winding cooling automatically shifted from Reactor Building Chilled Water to Reactor Building Closed Cooling Water
- C. (1) Reactor Recirc Pump (RRP) motor bearing and seal temperatures
(2) Reactor Building Closed Cooling Water flow to the Recirc pump bearing and seal coolers automatically isolated
- D. (1) Reactor Recirc Pump (RRP) motor bearing and seal temperatures
(2) RRP bearing and seal cooling automatically shifted from Reactor Building Chilled Water to Reactor Building Closed Cooling Water

K&A # 400000 A3.01
Importance Rating 3.0

QUESTION 18

RO Tier 2 Group 1

K&A Statement:

Ability to monitor automatic operations of the CCWS including:
Setpoints on instrument signal levels for normal operations,
warnings, and trips that are applicable to the CCWS

Justification:

- A. Incorrect, RBCW, not RBCCW normally cool this load. Although RBCCW can swap to supply it, the RBCW valves isolate on high drywell pressure. Candidates may select this if they do not recall that the normal cooling supply to the winding coolers is RBCW vice RBCCW.
- B. Incorrect, in this condition, RBCW flow to the winding coolers is isolated by the high DW pressure, resulting in no cooling flow to any drywell RBCW loads. Candidates may select this if they do not recall that drywell RBCW valves isolate, and believe the added heat load to the drywell atmosphere will reduce cooling to other components.
- C. **Correct, RBCCW piping that penetrates the primary containment will isolate when DW pressure exceeds 1.72 psig, stopping flow to recirc pump coolers, therefore recirc pump temperatures should be closely monitored.**
- D. Incorrect, bearing and seal cooler cooling flow is normally provided by RBCCW and will isolate on high DW pressure, therefore there will be no shift in cooling flow. Candidates may select this if they do not correctly recall the normal cooling water supply for these coolers and that cooling flow will isolate on high DW pressure.

K/A Match Justification:

This question matches the stated K/A since the candidates are required to recall the automatic actions associated with the RBCCW and RBCW system when drywell pressure is above the high drywell pressure setpoint, determine which loads are affected by the RBCCW containment isolation and will require additional monitoring.

References: ON-159-002 rev 29, TM-OP-014 rev 1, Reference Required none
TM-OP-064C rev 10, ON-114-001 rev 21

Learning Objective: 1694.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 5/24/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 19

A reactor startup is in progress on Unit 1. The PCOM is preparing to withdraw the SRM A and D detectors to maintain count rate between 1000 and 100,000 cps. The following conditions exist:

- IRMs indicate between 10 and 20 on range 1
- SRM A indicates 22000 cps; retract permit light illuminated
- SRM D indicates 18000 cps; retract permit light illuminated

The drive out pushbutton is depressed and sticks in the depressed position.

A and D SRM detectors will begin to withdraw, then...

- A. EACH will stop withdrawing when their ASSOCIATED count rate drops below 100 cps.
- B. EACH will stop withdrawing when their ASSOCIATED retract permit light extinguishes.
- C. BOTH will stop withdrawing when the EITHER retract permit light extinguishes.
- D. EACH will stop withdrawing when they EACH reach their full out limit.

K&A # 215004 A4.07

Importance Rating 4.4

QUESTION 19

RO Tier 2 Group 1

K&A Statement:

Source Range Monitors:

Ability to manually operate and/or monitor in the control room:

Verification of Proper Functioning/Operability

Justification:

- A. Incorrect, the detectors will continue to withdraw until they reach their out limits. A rod block will be inserted at 100 cps. Candidates may select this if they do not recall that the detector drive circuit only responds to a drive command and/or limit switches.
- B. Incorrect, the retract permit will only cause a rod block. Candidates may select this if they believe the common misconception that the retract permit signal impacts the ability to move the detector.
- C. Incorrect, the retract permit will only cause a rod block. Candidates may select this if they believe the common misconception that the retract permit signal impacts the ability to move the detector.
- D. **Correct, the detector drive circuit will only respond to pushbutton commands and/or limit switch actuation.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall details regarding operation of the SRM detector drive circuit in order to properly monitor its operation.

References: TM-OP-078A rev 3

Reference Required none

Learning Objective: 1340.c

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP078A/1340 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/04/11

QUESTION 20

Unit 1 is in MODE 4, with RHR pump 1A in service for shutdown cooling.

A LOCA occurs, resulting in RPV level rapidly lowering until the leak is stopped. RPV level stabilizes at +5"

Which one of the following describes the actions the PCOP should take with regard to the RHR system?

- A.
 - Verify that RHR Shutdown Cooling suction isolation valves F008, F009 AND RHR loop A injection valve F015A automatically SHUT;
 - Verify RHR pump 1A automatically trips.

- B.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 and F009, AND RHR pump A Shutdown Cooling suction valve F006A automatically SHUT;
 - Verify RHR pump 1A automatically trips.

- C.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 , F009 AND RHR loop A injection valve F015A automatically SHUT;
 - Manually trip RHR pump 1A.

- D.
 - Verify that RHR Shutdown Cooling suction isolation valves F008 and F009, AND RHR pump A Shutdown Cooling suction valve F006A automatically SHUT;
 - Manually trip RHR pump 1A.

K&A # 205000 A4.02

Importance Rating 3.6

QUESTION 20

RO Tier 2 Group 1

K&A Statement:

Ability to manually operate and/or monitor in the control room:
SDC/RHR suction valves

Justification:

- A. **Correct, when RPV level reaches +13", SDC suction valves F008 & F009 auto close. This results in a loss of suction path automatic trip of RHR pump A, since F004A will also be shut due to the SDC lineup.**
- B. Incorrect, F006A will remain open. The candidate may select this if they incorrectly believe that F006A will also auto close.
- C. Incorrect, the A RHR pump will automatically trip due to loss of suction. The candidate may select this if they incorrectly believe that the RHR pump will remain running with no suction path.
- D. Incorrect, F006A will not shut, and RHR pump A will trip. The candidate may select this if they incorrectly believe that the RHR pump will remain running with no suction path and F006A will auto close.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the RHR suction valve interlocks in order to properly monitor the system response following a low RPV level condition.

References: TM-OP-049 rev 7

Reference Required

none

Learning Objective: 181.q

Question source: New

Question History: New

Cognitive level:

Memory/Fundamental knowledge:

Comprehension/Analysis: X

10CFR55

41(b)7

Comments:

Created/Modified by: T. North, 9/2/10

Reviewed by: M. Jacopetti 01/04/11

QUESTION 21

EO-100-113, "Level/Power Control", directs operators to reset the Main Generator lockout relays if a Main Turbine trip has occurred.

This action is required to...

- A. maintain normal power to the auxiliary busses by preventing transfer to the startup supply.
- B. maintain the MSIVs open by preventing an isolation signal due to loss of the auxiliary busses.
- C. prevent loss of significant equipment due to an undesired load shed on auxiliary busses.
- D. prevent loss of equipment required for accident mitigation due to a load shed of the ESS busses.

K&A # 262001 2.4.18
Importance Rating 3.3

QUESTION 21

RO Tier 2 Group 1

K&A Statement:

Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.

Justification:

- A. Incorrect, this transfer will not be prevented by resetting the lockouts.
- B. Incorrect, the normal power supply to RPS (N4S) is the RPS MG Sets, which are powered from the ESS Buses. The Aux Buses provide the alternate power supply. Therefore, a loss of the Aux Buses will not result in an MSIV isolation. Candidate may choose this if they are unable to remember the normal and alternate supplies to RPS.
- C. **Correct, per EO-000-113 bases, the intent of this step is to prevent an inappropriate aux bus load shed. Since spurious operation of the load shed will cause an undesirable loss of loads such as condensate pumps, SW pumps, etc, main generator lockouts are reset if RPV water level can be maintained >-129"**
- D. Incorrect, the ESS load shed is desirable in EOPs since it ensures equipment needed for accident mitigation has a reliable source of power.

K/A Match justification:

This question matches the stated K/A since candidates must recall knowledge of EOP action bases related to AC distribution.

References: EO-000-113 rev 8, SSES-EPG rev 8 Reference Required none

Learning Objective: 14613

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)

Comments Created by: T. North, 10/10/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 22

Unit 1 is operating in MODE 1.

During functional testing of the Automatic Depressurization System (ADS) system, it is determined that the “ADS MANUAL INITIATION A” Pushbutton, HS-B21-1S30 A, has failed.

The pushbutton CANNOT be armed OR depressed.

Determine the affect this failure will have on the ADS system;
AND, given Tech Specs 3.3.5.1, “Emergency Core Cooling System Instrumentation” determine the status of LCO 3.3.5.1:

- A.
 - ADS CAN be manually initiated because BOTH the B and D pushbuttons are still operable.
 - LCO 3.3.5.1 Condition A applies because the required number of manual channels are NOT operable.

- B.
 - ADS CAN be manually initiated because BOTH the B and D pushbuttons are still operable.
 - ALL Functions required by LCO 3.3.5.1 and table 3.3.5.1-1 ARE operable.

- C.
 - ADS CANNOT be manually initiated because ALL FOUR pushbuttons are required to actuate the logic.
 - LCO 3.3.5.1 Condition A applies because the required number of manual channels are NOT operable.

- D.
 - ADS CANNOT be manually initiated because ALL FOUR pushbuttons are required to actuate the logic.
 - ALL Functions required by LCO 3.3.5.1 and table 3.3.5.1-1 ARE operable.

K&A # 218000 2.2.40

Importance Rating 3.6

QUESTION 22

RO Tier 2 Group 1

K&A Statement:

Equipment Control: Ability to apply technical specifications for a system.

Justification:

- A. **Correct, arming and depressing the B and D pushbuttons will result in manual initiation of the ADS logic. The minimum number of required channels for the manual function of ADS instrumentation not met per table 3.3.5.1-1, therefore LCO 3.3.5.1 is not met.**
- B. Incorrect, see A above. Candidates may select this if they do not correctly apply table 3.3.5.1-1 requirements.
- C. Incorrect, arming and depressing the B and D pushbuttons will result in manual initiation of the ADS logic. BOTH buttons in EITHER logic can initiate ADS. Candidates may select this if they incorrectly recall that all 4 buttons are required.
- D. Incorrect, ADS can be initiated using the B and D pushbuttons. LCO 3.3.5.1 is not met due to the manual function. Candidates may select this if they incorrectly determine that the manual function is not required in Mode 1.

K/A Match Justification:

This question matches the stated K/A since candidates must apply tech specs for the given conditions.

References: TS 3.3.5.1 rev 3

Reference Required

TS
3.3.5.1

Learning Objective: 12701

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 11-12-10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 23

Unit 1 is operating at full power with 125 VDC panel 1D624 de-energized.

A loss of feed occurs resulting in RPV level dropping to -45"

Which one of the following is CORRECT?

- A. RCIC will NOT automatically start and inject to the RPV, but can be started by arming and depressing the RCIC Manual Initiation pushbutton on 1C601.
- B. RCIC will NOT automatically start and inject to the RPV, but can ONLY be manually started component by component.
- C. HPCI will NOT automatically start and inject to the RPV, but can be started by arming and depressing the HPCI Manual Initiation pushbutton on 1C601.
- D. HPCI will NOT automatically start and inject to the RPV, but can ONLY be manually started component by component.

K&A # 206000 K2.03
Importance Rating 2.8

QUESTION 23

RO Tier 2 Group 1

K&A Statement:

Knowledge of electrical power supplies to the following: Initiation logic: BWR-2,3,4

Justification:

- A. Incorrect, RCIC automatic operation is unaffected by the DC power loss since its logic is powered by 1D614. Candidates may select this if they do not correctly recall the power to RCIC and HPCI initiation logic.
- B. Incorrect, see A above.
- C. Incorrect, the loss of power to HPCI initiation logic will also render the arm and depress pushbutton inoperable. Candidates may select this if they do not correctly recall the HPCI auto start logic arrangement.
- D. **Correct, HPCI auto initiation logic is powered by 1D624 and will prevent HPCI automatic start operation. HPCI can be aligned to inject, but only using component by component manipulation.**

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall the power supply for HPCI initiation logic and details regarding which HPCI components are affected by a loss of this power.

References: TM-OP-052 rev 4

Reference Required none

Learning Objective: 10367.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 12/15/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 24

With both units operating in MODE 1, HSS-0653B, one of the four Channel 'C' Common 125V DC Load Manual Transfer Switches (for diesel generator ESW Valve control and indication and, Diesel Generator Fuel Oil Booster Pump control), is transferred from its NORMAL position to its ALTERNATE position.

Which one of the following statements describes what will occur as a result of this?

The loads powered via HSS-0653B are now powered from (1); AND there will be (2).

- A. (1) Unit 2;
(2) a MOMENTARY loss of power to the affected loads since this switch is "break-before-make"
- B. (1) Unit 1;
(2) a MOMENTARY loss of power to the affected loads since this switch is "break-before-make"
- C. (1) Unit 2;
(2) NO loss of power to the affected loads since this switch is "make-before-break"
- D. (1) Unit 1;
(2) NO loss of power to the affected loads since this switch is "make-before-break"

K&A # 263000 K4.02
Importance Rating 3.1

QUESTION 24

K&A Statement:

RO Tier 2 Group 1

Knowledge of D.C. ELECTRICAL DISTRIBUTION design feature(s) and/or interlocks which provide for the following: Breaker interlocks, permissives, bypasses and cross ties: Plant-Specific

Justification:

- A. **Correct, the alternate supply is from Unit 2 (2D264). The switch is break-before-make and will result in a momentary power loss to affected loads**
- B. Incorrect, power supply is from unit 1 in NORMAL. Candidates may select this if they do not correctly recall the normal and alternate power sources for the common DC loads
- C. Incorrect, power supply is from unit 1 in NORMAL. A momentary power loss to affected loads will occur due to the "break-before-make" switch operation. Candidates may select this if they do not correctly recall how the transfer switch is interconnected between units and the annunciator arrangement.
- D. Incorrect, a momentary power loss to affected loads will occur due to the "break-before-make" switch operation. Candidates may select this if they believe this transfer is annunciated.

K/A Match Justification:

This question matches the stated k/A since candidates must recall knowledge of DC distribution system cross tie switches.

References: TM-OP-002-ST rev 5, OP-102-002 rev 13 Reference Required none

Learning Objective: 10144

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE Bank
TMOP002/10144 004

Question History: MODIFIED Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: *modified to remove reference to annunciation and add switch details.* Modified by: T. North, 11-22-10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 25

A failure of the Reactor Protection System (RPS) has occurred at Unit 1 requiring manual initiation of Alternate Rod Insertion (ARI).

The PCOP attempts to arm and depress BOTH the Div 1 AND Div 2 ARI manual initiation pushbuttons on 1C601.

The DIV 1 pushbutton is armed and depressed successfully; HOWEVER, the arming collar on the DIV 2 ARI manual pushbutton FAILS; AND the DIV 2 pushbutton CANNOT be armed OR depressed.

The PCOM should report that (1), because (2) ARI vent and block valves repositioned.

- A. (1) ALL Control Rods inserted
(2) ALL FOUR
- B. (1) Control Rods DID NOT insert
(2) ONLY the DIV 1
- C. (1) Control Rods DID NOT insert
(2) NONE of the
- D. (1) ALL Control Rods inserted
(2) ONLY the DIV 1

K&A # 212000 A4.16
Importance Rating 4.4

QUESTION 25

RO Tier 2 Group 1

K&A Statement:

Ability to manually operate and/or monitor in the control room:
Manually activate anticipated transient without SCRAM
circuitry/RRCS: Plant-Specific

Justification:

- A. Incorrect, the div 2 ARI valves can only be repositioned by the div 2 logic. Both div 1 and div 2 ARI valves are required to cause rod motion. Candidates may select this if they fail to recall that ARI logic requires both div 1 and div 2 pushbuttons to satisfy the complete logic and reposition all 4 valves.
- B. **Correct, the failure of div 2 logic results in only the div 1 valves repositioning, and since all 4 ARI valves are required to reposition to cause rod motion, no rod motion occurs.**
- C. Incorrect, the div 1 valves will reposition. Candidates may select this if they incorrectly believe that both pushbuttons are required to actuate either division's logic.
- D. Incorrect, no rod motion will occur. Candidates may select this if they fail to recall that the scram air header requires both div 1 and div 2 valves to vent and cause rod motion.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the logic arrangement of the ARI system to predict what the correct report will be following this failure.

References: TM-OP-058 rev 9 Reference Required none

Learning Objective: 11480.j

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 9/18/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 26

Unit 1 was operating at 20 percent power when a loss of all high pressure feed occurs.

- Reactor water level dropped to -140 inches
- Offsite power is available
- Unit 2 RHR pumps are in standby

Which one of the following describes the Unit 1 RHR Pump start sequence under these conditions?

- A. All four RHR Pumps start immediately.
- B. A and B RHR Pumps start immediately;
C and D RHR pumps start after a 7 second time delay.
- C. A and B RHR Pumps start after a 3 second time delay;
C and D RHR pumps start after a 7 second time delay.
- D. All four RHR Pumps start after a 3 second time delay.

K&A # 203000 A3.08

Importance Rating 4.1

QUESTION 26

RO Tier 2 Group 1

K&A Statement:

Ability to monitor automatic operations of the RHR/LPCI:
INJECTION MODE (PLANT SPECIFIC) including: System
initiation sequence

Justification:

- A. Incorrect, C/D start after a seven second delay. Candidates may select this if they do not recall that C/D have a 7 sec time delay.
- B. Correct, A/B start immediately, C/D on 7 sec TD to prevent O/L the ESS busses**
- C. Incorrect, A/B start immediately, 3 sec TD is only applicable with LOOP. Candidates may select this if the incorrectly apply the 3 sec LOOP time delay to this plant condition.
- D. Incorrect, 3 sec TD is only applicable with LOOP. Candidates may select this if the incorrectly apply the 3 sec LOOP time delay to this plant condition.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the correct LPCI pump start sequence to properly monitor automatic system operation.

References: TM-OP-049 rev 7

Reference Required none

Learning Objective: 181.f

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP049/192 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/04/11

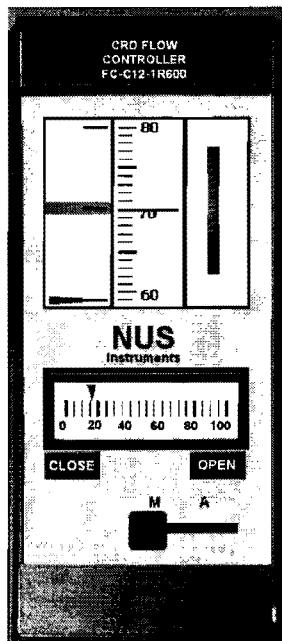
QUESTION 27

The PCOP is preparing to place the CRD Flow Controller, FC-C12-1R600, in automatic in accordance with OP-155-001, "CONTROL ROD DRIVE HYDRAULIC SYSTEM."

The following parameters represent the stable CRD System conditions prior to placing the Flow Controller to automatic:

- Flow Control Station Total Water Flow FI-1R019 ~ 63 gpm.
- DRIVE WATER DIFF PRESSURE PDI-C12-1R602 ~ 250 psid.
- COOLING WATER DIFF PRESSURE PDI-C12-1R603 ~ 20 psid.
- CRD Flow Controller, FC-C12-1R600 Meter indications are as given on the attached diagram.

If the PCOM takes CRD Flow Controller, FC-C12-1R600, from MANUAL to AUTO, what will be the change (faster, slower or the same) in the CRD speeds for normal control rod motion, and why?



CRD speed for normal notching of a control rod will be...

- THE SAME, since control rod speeds are set by adjusting needle valves in the flow from the below piston area of the CRD.
- FASTER, due to higher drive header pressure when the flow control valve opens.
- THE SAME, since the pressure control valve is set to maintain a constant pressure.
- SLOWER, due to lower drive header pressure when the flow control valve closes.

K&A # 201003 K1.01
Importance Rating 3.2

QUESTION 27

RO Tier 2 Group 2

K&A Statement:

Knowledge of the physical connections and/or cause- effect relationships between CONTROL ROD DRIVE MECHANISMS and the following: Control Rod Drive Hydraulic System

Justification:

- A. Incorrect, The needle valves adjust speed for a SET PRESSURE, not for varying system pressure conditions. The candidate may remember the purpose of the needle valves is to set speed but not recognize that this is not controlling for this situation, this answer may be chosen.
- B. Correct, with the controller set for 70 gpm, the flow control valve will automatically open when placed in auto. This results in higher drive pressure and a resultant speed increase.**
- C. Incorrect, The pressure control valve has been positioned to establish the current pressures. The valve does not change position. There is less of a pressure drop across the flow control valve and thus higher pressure downstream and an increase in DP. This increases the DP across the control rods and will cause the rod to move faster. If the candidate believes the PCV will automatically change position to maintain pressure, this answer may be chosen.
- D. incorrect, If the candidate does not understand that the deviation meter indicates that flow will increase then the candidate will believe that flow will decrease.

K/A Match Justification:

This question matches the stated K/A since candidates are required to apply knowledge of system and component interrelationships to predict the response of the CRDM following changes made to the CRDH system.

References: TM-OP-055 rev 5

Reference Required None

Learning Objective: 10034.c

Question source: INPO bank #28200

Question History: SSES 2004 NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)6

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/04/11

QUESTION 28

Unit 1 was operating at 90% power when the following sequence of events occur:

- The inboard MSIVs failed closed.
- RPV level reached -42" before being restored to +35".
- RPV pressure dropped to 1,020 psig and is being maintained between 800 and 1,087 psig.
- RHR Loop A was placed in Suppression Pool Cooling.
- The feeder breaker to MCC 1B237 tripped
- A small LOCA caused Drywell pressure to reach 2.5 psig.

Which valves will reposition as a result of these conditions?

- A. HV-151-F007A, RHR Pump A/C Min Flow Valve, AND HV-151-F028A, Suppression Spray Test Shutoff Valve.
- B. HV-151-F017A, RHR Loop A Injection Flow Control Valve, AND HV-151-F024A, Test Line Control Valve.
- C. HV-151-F027A, Suppression Pool Spray Control Valve, AND HV-151-F048A, Heat Exchanger A Shell Side Bypass Valve.
- D. HV-11210A, RHR Service Water Heat Exchanger Inlet Valve, AND HV-11215A, RHR Service Water Heat Exchanger Outlet Valve.

K&A # 219000 K2.01
Importance Rating 2.5

QUESTION 28

RO Tier 2 Group 2

K&A Statement:

RHR/LPCI: Torus/Suppression Pool Cooling Mode:

Knowledge of electrical power supplies to the following: Valves

Justification:

- A. Correct, When Drywell pressure exceeds 1.72 psig, HV-151-F028A (powered from 1B216) closes, terminating Suppression Pool Cooling. HV-151-F007A (powered from 1B219) opens after system flow is below 3,000 gpm for 30 seconds.**
- B. Incorrect, HV-151-F017A is closed per OP-149-004 when aligning for Suppression Pool Cooling and will not automatically reposition unless RPV pressure reaches 420 psig. HV-151-F024A (powered from 1B237) is open while in supp pool cooling and does not close on the high Drywell pressure signal due to the power loss.
- C. Incorrect, HV-151-048A (powered from 1B237) will receive an open signal from the high Drywell pressure but will not reposition due to the loss of power. HV-151-F027A (powered from 1B236) is already closed when it receives a closed signal due to the high Drywell pressure.
- D. Incorrect, HV-11210A/15A heat exchanger RHRSW inlet/outlet valves, although powered from MCC 1B237, do not receive closed signals from the -38" RPV level signal and will remain open. It is the RHRSW Pump that trips on the -38" signal.

K/A Match Justification:

This question matches the stated K/A since candidates are required to correctly recall the power supplies to various motor operated valves utilized in suppression pool cooling mode of RHR.

References: TM-OP-049 rev 7 Reference Required none

Learning Objective: 10499.b

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North 12/20/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 29

Unit 1 is operating in MODE 1 with the following steady state conditions present:

- Reactor power: 90%
- Recirc flow: 89% of rated
- RPV pressure: 1015 psig

A failure of the Reactor Recirc Flow Control System then causes a slow RISE in the speed of BOTH Recirc pumps.

Predict the INITIAL effect this failure will have on the Main Turbine control system, and RPV pressure:

- A. Main Turbine Bypass Valves will slowly open as reactor power rises above 90%, and RPV pressure will be maintained at 1015 psig.
- B. Main Turbine Bypass Valves will slowly open as reactor power rises above 90%, and RPV pressure will slowly rise above 1015 psig.
- C. Main Turbine Control Valves will slowly open as reactor power rises above 90%, and RPV pressure will be maintained at 1015 psig.
- D. Main Turbine Control Valves will slowly open as reactor power rises above 90%, and RPV pressure will slowly rise above 1015 psig.

K&A # 202002 K3.04
Importance Rating 2.9

QUESTION 29

RO Tier 2 Group 2

K&A Statement:

Knowledge of the effect that a loss or malfunction of the RECIRCULATION FLOW CONTROL SYSTEM will have on following: Reactor/turbine pressure regulation system

Justification:

- A. Incorrect, bypass valves will not begin to open until turbine load limits are reached. Pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not correctly recall that the load limit is set 100 MWe above actual turbine load.
- B. Incorrect, bypass valves will not begin to open until turbine load limits are reached. Pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not correctly recall that the load limit is set 100 MWe above actual turbine load.
- C. Incorrect, pressure will rise as reactor power rises due to the rise in recirc pump speed. Candidates may select this if they do not recall that RPV pressure will rise as power is ramped up.
- D. **Correct, the rise in recirc pump speed will cause a corresponding rise in reactor power. The turbine control system will allow RPV pressure to rise proportionally with the power rise and cause the control valves to open, increasing turbine load.**

K/A Match Justification:

This question matches the stated K/A since candidates must predict the response of the main turbine control system following a failure of the reactor recirc flow control system.

References: TM-OP-093L rev 6, TM-OP-064E rev 0 Reference Required none

Learning Objective: 10341.a

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 9/19/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 30

Unit 1 at is at full power.

PREDICT the impact on Reactor Feed Pumps (RFP) if the "A" Narrow Range Water Level Transmitter were to fail UPSCALE AND why:

- A. All three (3) RFPs will trip on level 8 because the logic only requires one (1) upscale signal to cause a trip.
- B. ONLY RFP "A" will trip on level 8 because each transmitter only feeds its respective RFP trip logic.
- C. NONE of the RFPs will trip on level 8 because the trip logic requires at least two (2) redundant trip signals.
- D. All three (3) RFPs will trip on level 8 because the Feedwater Level Control System will cause actual RPV level to rise above level 8.

K&A # 216000 K4.03

Importance Rating 3.4

QUESTION 30

RO Tier 2 Group 2

K&A Statement:

Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following:
Redundancy of sensors

Justification:

- A. Incorrect, no RFPs trip. Logic is 2 out of 3. Candidates may select this if they do not correctly recall the RFP trip logic arrangement.
- B. Incorrect, logic is not arranged this way. Candidates may select this if they do not correctly recall the RFP trip logic arrangement.
- C. Correct, the logic requires 2 out of 3 redundant level 8 signals to actuate the trip. This trip is applied to all 3 feed pumps when met.**
- D. Incorrect, the ICS/DCS FWLC system contains sufficient redundant RPV level signals to be impervious to one level input failing, so actual RPV level will not falsely respond to the failure. Candidates may select this if they do not correctly recall that ICS/DCS will not respond to the level transmitter failure

K/A Match Justification:

This question matches the stated K/A since candidates must recall how the RFP trip logic and ICS/DCS utilizes redundant sensors to monitor and control RPV water level.

References: TM-OP-080 rev 9

Reference Required none

Learning Objective: 10561.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 6/2/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 31

Unit 2 is in MODE 5 with the following conditions present:

- Reactor Mode Switch is in REFUEL
- Unit 2 Refueling platform Reactor Select Switch selected to NORM
- Unit 2 Refueling platform is positioned over the Unit 2 reactor
- Refuel switch #1 is activated
- Fuel grapple is UNLOADED
- Monorail hoist is UNLOADED
- Frame mounted hoist is UNLOADED
- Control Rod 10-23 is at position 48

Given these conditions, which one of the following changes would prevent reverse refueling platform motion?

- A. The Frame mounted hoist is loaded.
- B. Refuel Switch #2 is activated.
- C. A second control rod is withdrawn beyond position 00.
- D. Refuel switch #1 is DE-activated.

K&A # 234000 K5.01
Importance Rating 2.9

QUESTION 31

RO Tier 2 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to FUEL HANDLING EQUIPMENT : Crane/hoist operation

Justification:

- A. **Correct, reverse movement is blocked if selected to NORM and over NORM; a control rod is withdrawn; refuel switch #1 is activated; and EITHER fuel grapple loaded >550lbs, OR frame hoist >500lbs; OR monorail hoist >500lbs. Raising the frame hoist load above this limit completes the REVERSE movement block circuit. It also prevents raising the hoist any further.**
- B. Incorrect, refuel switch #2 is not in this circuit and conditions to enable it to prevent reverse motion are not present. Candidates may select this if they incorrectly believe that refuel switch #2 provides input to the circuit.
- C. Incorrect, an additional rod withdrawn will not affect the circuit and would not be permitted by RMCS. Candidates may select this if they incorrectly believe that a second control rod may be withdrawn in this condition.
- D. Incorrect, de-activation of refuel switch #1 would indicate the bridge is no longer above the normal reactor and would permit reverse motion. Candidates may select this if they do not correctly recall the purpose and function of refuel switch #1.

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall details of fuel handling crane and hoist equipment operation.

References: TM-OP-081B rev 3 Reference Required none

Learning Objective: 10787.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 6/2/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 32

Unit 1 has experienced a loss of Instrument Air.

Instrument Air Header Pressure is 65 psig, down slow.

The PCOM then places the Reactor Mode Switch to SHUTDOWN

This action is required because...

- A. Control rods may begin to drift into the core when the CRD Flow Control Valve fails open.
- B. Control Rod Drive Mechanisms may overheat when the CRD Flow Control Valve fails shut.
- C. Control rods may randomly insert when individual scram valves begin to drift open.
- D. Reactor coolant from the Scram Discharge Volume will enter the Reactor Building Sump and cause elevated room temperature.

K&A # 201001 K6.03
Importance Rating 2.8

QUESTION 32

RO Tier 2 Group 2

K&A Statement:

Knowledge of the effect that a loss or malfunction of the following will have on the CONTROL ROD DRIVE HYDRAULIC System :
Plant Air Systems

Justification:

- A. Incorrect, the CRD flow control valve will fail closed upon loss of instrument air. Candidates may select this if they incorrectly believe this valve fails open causing cooling water DP to cause rods to drift in.
- B. Incorrect, this will indeed occur following the loss of instrument air, but is not the reason for placing the mode switch in shutdown. Candidates may select this if they incorrectly recall the reason for inserting a manual scram.
- C. **Correct, scram valves are held closed by IA, and may drift open at low IA pressures, resulting in random individual rod scrams. The mode switch is placed in shutdown to preclude operating with unanalyzed rod patterns.**
- D. Incorrect, until the SDV vents and drains fail closed, Rx water will enter the RB Sump which is cooled by RBCCW, therefore RB temperatures will not rise. Candidates may select this if they incorrectly recall that the SDV vents and drains fail closed on a loss of air.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the physical interrelationship between condensate and CRD and predict the effect of a failure of the.

References: ON-118-001, rev 23 Reference Required None

Learning Objective: 2149.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 12-20-10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 33

Both SSES Units are operating at full power with Control Room Emergency Outside Air Supply System (CREOASS) in the following lineup:

- CREOASS Fan "A" (0V101A) is selected to AUTO-STANDBY
- CREOASS Fan "B" (0V101B) is selected to AUTO-LEAD

The mode switch for the "A" Outside Air Radiation Monitor, RISHH-D12-0K618A, is then placed to the TRIP TEST position.

Which one of the following is the correct response of the CREOASS system?

- A. Fan "A" will automatically start, fan "B" will remain off.
- B. Fan "B" will automatically start, fan "A" will remain off.
- C. BOTH "A" AND "B" Fan's auto start function on HI-HI outside air radiation is disabled.
- D. ONLY the Fan "A" auto start function on HI-HI outside air radiation is disabled.

K&A # 290003 A1.05
Importance Rating 3.2

QUESTION 33

RO Tier 2 Group 2

K&A Statement:

Ability to predict and/or monitor changes in parameters associated with operating the CONTROL ROOM HVAC controls including: Radiation monitoring (control room)

Justification:

- A. **Correct, placing the rad monitor to TRIP TEST will auto start its associated divisional fan. The A monitor starts the A fan. Fan A will auto start regardless of the position of the auto-standby switch.**
- B. Incorrect, despite that the B fan is selected to lead, only the B rad monitor will start the B fan. Candidates may select this if they incorrectly believe that placing the A rad monitor to trip test will start the fan selected to lead.
- C. Incorrect, the auto start feature for the fans is not disabled in trip test. Candidates may select this if they incorrectly believe that the trip test position will disable the fan auto start feature.
- D. Incorrect, the auto start feature for the fans is not disabled in trip test. Candidates may select this if they incorrectly believe that the trip test position will disable the fan auto start feature.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the functional relationship between rad monitors and control room ventilation components and predict the effect of operating the rad monitor controls.

References: TM-OP-030 rev 4, OP-030-002 rev 26 Reference Required none
E-197-sheet 1 rev 16, -sheet 3 rev 22

Learning Objective: 1965.b

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 6/3/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 34

Unit 1 is operating in MODE 1 at 70% power. Power ascension is in progress following refueling outage 17.

Control rod 38-31 is being withdrawn from position 12 to position 16 when a valid Rod Block Monitor (RBM) upscale trip halts rod motion.

Annunciator AR-103-001 (C04), "RBM UPSCALE OR INOP ROD BLOCK" is illuminated.

In this condition, control rod motion stopped when RBM reached (1); AND, in accordance with alarm response procedure AR-103-001 (C04), operators must (2) in order to continue rod withdrawal.

- A. (1) 117%
(2) select an edge rod to clear the rod block, then re-select rod 38-31 ONLY
- B. (1) 117%
(2) verify thermal limits will not be exceeded; de-select then re-select rod 38-31
- C. (1) 109.2%
(2) select an edge rod to clear the rod block, then re-select rod 38-31 ONLY
- D. (1) 109.2%
(2) verify thermal limits will not be exceeded; de-select then re-select rod 38-31

K&A # 215002 A2.01
Importance Rating 3.3

QUESTION 34

K&A Statement:

RO Tier 2 Group 2

Ability to (a) predict the impacts of the following on the ROD BLOCK MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Withdrawal of control rod in high power region of core: BWR-3,4,5

Justification:

- A. Incorrect, it is inappropriate in this condition to simply clear the rod block by selecting an edge rod. This action may work to temporarily clear the block, however, since the rod block was due to a valid local overpower condition, this action alone is insufficient to permit continued rod motion. Verification of thermal limit margin is required to ensure fuel damage will not occur due to the local power conditions. Candidates may select this since the procedure permits this action when the rod block is spurious.
- B. Correct, per the cycle 17 COLR, the intermediate setpoint applies when reactor power is >61%. The alarm response procedure requires that the crew verify with RE that there is sufficient margin to thermal limits, then reselect the rod to reset the rod block (the rod must first be de-selected, although the procedure does not state this directly).**
- C. Incorrect, the intermediate rod block setpoint of 117% is in effect when power is >61% and < 81%. Candidates may select this if they do not correctly recall the RBM setpoint, and they assume they can continue rod motion without thermal limit verification (See A above).
- D. Incorrect, the intermediate rod block setpoint of 117% is in effect when power is >61% and < 81%. Candidates may select this if they do not correctly recall the intermediate RBM setpoint.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the conditions necessary to provide a valid rod block when withdrawing a control rod in a central (high powered) region of the core. Additionally, they must recognize the appropriate action to be taken in accordance with the approved procedure for the stated condition of a valid rod block.

References: COLR/TRM section 3.2 rev 11; TM- Reference Required none
OP-078K rev 4; AR-103-001-C04 rev 38.

Learning Objective: 15806.i, 15811.e

Question source: Modified INPO bank #25961

Question History: Pilgrim 2003 NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55

41(b)5

Comments:

Modified by: T. North, 8/31/10

Reviewed by: M. Jacopetti 01/04/11

QUESTION 35

Unit 1 is at full power when annunciator AR-103-001 (H04) "RDCS INOP ROD BLOCK" is received.

I&C reports that control rod 22-23 Transponder Card has failed.

Which one of the following CORRECTLY describes the extent of the rod block AND what actions will restore rod movement capability for all other rods?

- A.
 - Control rod INSERTION AND WITHDRAWAL is blocked.
 - Bypass the rod at the Rod Drive Control Cabinet AND Reset the Rod Drive Control system.

- B.
 - Control rod INSERTION AND WITHDRAWAL is blocked.
 - Bypass the rod at the Rod Drive Control Cabinet ONLY.

- C.
 - ONLY control rod WITHDRAWAL is blocked.
 - Bypass the rod at the Rod Drive Control Cabinet AND Reset the Rod Drive Control system.

- D.
 - ONLY control rod WITHDRAWAL is blocked.
 - Bypass the rod at the Rod Drive Control Cabinet ONLY.

K&A # 201002 K4.02

Importance Rating 3.5

QUESTION 35

RO Tier 2 Group 2

K&A Statement:

Knowledge of Reactor Manual Control System design feature(s) and/or interlocks which provide for the following:
Control Rod Blocks

Justification:

- A. **Correct, The rod block generated by the transponder card failure fault in RDSCS prevents all rod motion, except scram. The associated control rod must be bypassed to remove the input, then RDSCS must be restarted (reset).**
- B. Incorrect, See 'A', above. The candidate may select this if they do not correctly recall that RDSCS must also be reset.
- C. See 'A', above. The candidate may select this if they incorrectly conclude this rod block is the same as all other rod blocks, which limit withdrawal.
- D. Incorrect, See 'A', above. The candidate may select this if they do not correctly recall that RDSCS must also be reset and they conclude this rod block is the same as all other rod blocks, which limit withdrawal.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of control rod block actuation by the Reactor Manual Control System.

References:

AR-103-001 Rev 38
OP-156-001 Rev 16
TM-OP-056-FS Rev 4

Reference Required

none

Learning Objective:

2469.b, 2470 a.

Question source:

New

Question History:

New

Cognitive level:

Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55

41(b)6

Comments:

Created by: T. North, 01/11/11
Reviewed by: M. Jacopetti 01/11/11

QUESTION 36

Unit 2 was manually scrammed from full power AND RPV level was restored to 48" five minutes after the scram.

Which one of the following indications most accurately reflects Reactor Coolant System temperature for the purpose of assessing the status of RPV thermal stratification per ON-200-101, Scram Scram Imminent?

- A. Reactor Recirc Loop A Temperature computer point NRT01.
- B. Reactor Vessel Bottom Head Drain Temperature computer point NLT01.
- C. Reactor Steam Dome Temperature computer point NFA05.
- D. Reactor Vessel Bottom Head Metal Temperature TR-B21-2R006 Point #5.

K&A # 204000 A4.09

Importance Rating 2.9

QUESTION 36

RO Tier 2 Group 2

K&A Statement:

Ability to manually operate and/or monitor in the control room:
Reactor water temperature

Justification:

- A. Incorrect, Following a scram from full power Recirc Pumps trip and RWCU isolates due to indicated RPV level dropping below -38". Although maintaining RPV level above 45" prompts natural circulation, the fact that RWCU is not in service results in the coolant in the Recirc loops being warmer than coolant temperature in the bottom head. ON-200-101 directs the use of bottom head drain temp because Recirc loop temperatures will not provide accurate RPV water temps with recirc pumps off. Candidates may select this distractor if they are unaware that a full-power scram causes indicated RPV level to drop below -38".
- B. **Correct. ON-200-101 directs that RWCU bottom head drain temperature be used to determine the status of thermal stratification since it provides the most appropriate and accurate temperature in the bottom head region necessary to assess the degree of RPV thermal stratification.**
- C. Incorrect, Reactor Steam Dome temperature computer point is used to determine the differential temperature between the steam dome and the reactor coolant in the bottom head. It does not provide the valid reactor coolant temperatures. Candidates may select this if they believe reactor coolant temperature is the same as the temperature of the steam in the RPV.
- D. Incorrect, although this thermocouple provides the outer bottom head metal temperature indication, it is not used for determining cooldown rates when above 200° F. SO-200-011 provides direction on when to use this parameter. Candidates may select this if they incorrectly assume this indicator will provide information about stratified temperature layers on the vessel wall and flange.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall that RWCU system provides the most accurate and useful RPV water temperature indication needed to monitor for thermal stratification.

References:	ON-200-101 rev 19	Reference Required	none
	SO-200-011 rev 17 (need to provide)		

Learning Objective: 1700.a

Question source: New

Question History: New

Cognitive level:	Memory/Fundamental knowledge:
	Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 12/20/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 37

Which one of the following statements describes the purpose of Speed Limiter #2 in the Reactor Recirc Flow Control system?

- A. Limits recirc pump speed to 48% to lower reactor power to within the capacity of the main condenser in the event of a Circ water pump trip.
- B. Limits recirc pump speed to 30% to lower reactor power to within the capacity of the main condenser in the event of a Circ water pump trip.
- C. Limits recirc pump speed to 48% to ensure sufficient NPSH to jet pumps in the event of a low RPV water level condition.
- D. Limits recirc pump speed to 30% to ensure sufficient NPSH to jet pumps in the event of a low RPV water level condition.

K&A # 202002 2.1.28
Importance Rating 4.1

QUESTION 37
K&A Statement:

RO Tier 2 Group 2
Recirc Flow Control:
Conduct of Operations: Knowledge of the purpose and function of major system components and controls.

Justification:

- A. **Correct, this is the setpoint and basis for speed limiter #2 per TM-OP-064E.**
- B. Incorrect, this setpoint is recirc pump minimum speed. Limiter #2 will only run the recirc pump to 48%. Candidates may select this if they do not correctly recall the setpoint for limiter 2.
- C. Incorrect, this is the basis for limiter #1. Candidates may select this if they incorrectly recall the limiter #2 basis.
- D. Correct, this is the minimum speed setpoint and the limiter #1 basis. Candidates may select this if they incorrectly apply the speed limiter #1 basis and minimum speed setpoint to limiter #2.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the purpose and function of recirc pump speed limiters.

References: TM-OP-064E rev 0 Reference Required none

Learning Objective: 16021.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 7/1/10
Reviewed by: M. Jacopetti 01/04/11

QUESTION 38

Which one of the following describes the correct sequence used when Reactor Building Zone 1 ventilation system is started in accordance with OP-134-002, "Reactor Building HVAC Zones 1 and 3", AND WHY this sequence is used?

- A.
 - The filtered exhaust fan is started first
 - Once a negative pressure has been drawn the operator starts the supply and exhaust fans
 - This sequence minimizes the pressure transient on the building.

- B.
 - The filtered exhaust fan is started first.
 - Once a negative pressure has been drawn the operator starts the supply and exhaust fans.
 - This sequence prevents an immediate trip of the supply fan on low flow.

- C.
 - The control switches for the supply and exhaust fans are first placed in start
 - The filtered exhaust fan is then started, causing all three fans to start simultaneously.
 - This sequence minimizes the pressure transient on the building.

- D.
 - The control switches for the supply and exhaust fans are first placed in start
 - The filtered exhaust fan is then started, causing all three fans to start simultaneously.
 - This sequence prevents an immediate trip of the supply fan on low flow.

K&A # 290001 K4.02

Importance Rating 3.4

QUESTION 38

RO Tier 2 Group 2

K&A Statement:

Knowledge of SECONDARY CONTAINMENT design feature(s) and/or interlocks which provide for the following: Protection against over pressurization

Justification:

- A. Incorrect, the switches are interlocked to ensure they are operated simultaneously. Candidates may select this if they do not recall that the fans are interlocked.
- B. Incorrect, the switches are interlocked to ensure they are operated simultaneously to limit the pressure transient. Candidates may select this if they do not recall that the fans are interlocked, and do not correctly recall the basis for the interlock.
- C. **Correct. Each of these fans is interlocked with the other so the switches are operated in this manner to start all off one switch change. This interlock prevents building overpressure by ensuring an exhaust fan is running when a supply fan is running.**
- D. Incorrect, the purpose of the interlock is to limit the building pressure transient. Candidates may select this if they do not correctly recall the basis for the interlock.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall knowledge of the fan starting interlock for RB zone 1 ventilation, and its basis.

References: OP-134-002 rev 47

Reference Required

none

Learning Objective: 1274.n

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP034/1277 001

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/05/11

QUESTION 39

Unit 2 is operating in MODE 4, with RHR pump 2C in shutdown cooling.

A pump casing leak then develops in RHR pump 2C causing RPV level to drop.

The crew trips and isolates RHR pump 2C, and RPV level stabilizes at +50"

Per ON-249-001, "Loss Of RHR Shutdown Cooling Mode", RPV level is currently (1) to promote natural circulation because it is (2).

- A. (1) TOO LOW
(2) BELOW the top of the steam separators

- B. (1) HIGH ENOUGH
(2) ABOVE the top of the steam separators

- C. (1) TOO LOW
(2) BELOW the bottom of the steam dryer skirt

- D. (1) HIGH ENOUGH
(2) ABOVE the bottom of the steam dryer skirt

K&A # 295001 AK1.01

Importance Rating 3.5

QUESTION 39

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION : Natural circulation

Justification:

- A. Incorrect, RPV level at or above 45" promotes natural circulation since level will be above the top of the steam separators. Therefore, level is currently sufficient since it is below the required level. Candidates may select this if they incorrectly recall the internal location of RPV components and/or the RPV level required to allow natural circ to take place.
- B. Correct, level must be above +45" and the top of the steam separators. With level at +50" the top of the steam separators will be covered.**
- C. Incorrect, level is currently above the bottom of the dryer skirt (approximately 0"), however this is not the level required to promote natural circ which is significantly higher. Candidates may select this if they incorrectly recall the internal location of RPV components and the RPV level required to allow natural circ to take place.
- D. Incorrect, although level is above the bottom of the steam dryer skirt, this is not high enough to allow circulation to take place, since level must be above the steam separators. Candidates may select this if they incorrectly recall the RPV level required to allow natural circ to take place.

K/A Match Justification:

This question matches the stated K/A since candidates must determine the operation implications of current RPV level with respect to the promotion of natural circulation from a procedural and physical standpoint following a complete loss of all forced circulation.

References: ON-149-001 rev 23 Reference Required none

Learning Objective: 15310.o

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)3

Comments: Created by: T. North, 9/7/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 40

Unit 1 has been operating at full power for the past year, when:

- Rx Vessel Water Level (Narrow Range) instrument, LIS-B21-1N024D, failed DOWNSCALE and FIN has been dispatched to investigate.
- another worker accidentally bumped RPS MG Set A EPA Breaker 1CBS003A-A causing it to TRIP OPEN.

Which one of the following describes plant conditions approximately 10 seconds later?

Reactor thermal power generation will be approximately (1) of full power, and this heat will be removed via the (2).

- A. (1) 7%
(2) Safety Relief Valves
- B. (1) 1%
(2) Bypass Valves
- C. (1) 100%
(2) Main Turbine Control Valves
- D. (1) 7%
(2) Bypass Valves

K&A # 295006 AK1.01

Importance Rating 3.7

QUESTION 40

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SCRAM : Decay heat generation and removal

Justification:

- A. Incorrect, This condition would not result in an MSIV isolation. Candidates may select this if they incorrectly believe that LIS-B21-1N024D, not LITS-B21-1N026D input to the N4S isolation logic for the MSIVs.
- B. Incorrect, decay heat will be approximately 7%. Candidates may select this if they cannot correctly recall the amount of decay heat following a full scram from 100% power.
- C. Incorrect, the events result in a full scram. Candidates may select this if they do not correctly determine that a full scram will occur.
- D. **Correct, The instrument failure will result in a B trip system half scram; and combined with the A half scram generated by the EPA breaker trip a full scram results; Decay heat following a scram from full power will be approximately 7% after 10 seconds. Since there is no condition that would cause an MSIV isolation, turbine bypass valves will be available to control pressure and remove decay heat.**

K/A Match Justification:

This question matches that stated K/A since candidates must first determine that a full scram will occur, and then determine the operational impact of the generation of decay heat following this scram.

References: TM-OP-058 rev 9

Reference Required none

Learning Objective:

Question source: Modified INPO Bank #25978

Question History: 2003 Pilgrim NRC exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)8

Comments: Modified by: T. North, 10-3-10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 41

Complete the following statement regarding a degraded voltage condition on 480 VAC safety busses:

Protection against a LOW voltage condition in the Reactor Protection power distribution system is provided by the ____ (1) ____, because the low voltage condition may cause ____ (2) ____.

- A. (1) RPS motor generator set voltage regulator;
(2) scram pilot solenoids to chatter and potentially lose the ability to actuate when required.
- B. (1) RPS motor generator set voltage regulator;
(2) instrument setpoints to drift in a NON-conservative direction affecting their scram safety functions.
- C. (1) Electrical Protection Assembly Breaker;
(2) scram pilot solenoids to chatter and potentially lose the ability to actuate when required.
- D. (1) Electrical Protection Assembly Breaker;
(2) instrument setpoints to drift in a NON-conservative direction affecting their scram safety functions.

K&A # 295003 AK1.03
Importance Rating 2.9

QUESTION 41

RO Tier 1 Group 1

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER : Under voltage/degraded voltage effects on electrical loads

Justification:

- A. Incorrect, while the RPS MG set provides voltage regulation, it is not relied upon for protection against an undervoltage condition. It also provides no ability to control the voltage in the alternate supply. Candidates may select this if they do not recall which component protects against the UV condition.
- B. Incorrect, while the RPS MG set provides voltage regulation, it is not relied upon for protection against an undervoltage condition. It also provides no ability to control the voltage in the alternate supply. Instrument setpoint drift is not the basis for the UV trip. Candidates may select this if they do not recall which component protects against the UV condition, or the resultant effect.
- C. **Correct, the low voltage trip of the EPA breakers in both the normal and alternate RPS supply is designed to provide the undervoltage protection for this condition. Per TSB 3.3.8.2 "In the event of a low voltage condition for an extended period of time, the scram solenoids can chatter and potentially lose their pneumatic control capability, resulting in a loss of primary scram function."**
- D. Incorrect, instrument setpoint drift is not the basis for the UV trip. Candidates may select this if they do not correctly recall the operational implication of the UV condition on RPS busses.

K/A Match Justification:

This question matches the stated K/A since candidates must understand the operational implications of a degraded voltage condition on 480 VAC busses and the component that prevents this.

References: TM-OP-058 rev 9, TSB 3.3.8.2 Reference Required none

Learning Objective: 10071.b, 15970

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)8

Comments: Created by: T. North, 5/26/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 42

Unit 1 is operating at full power when a grid disturbance causes the Main Generator output breaker to trip.

- The “Turbine Control Valve Fast Closure Scram” instruments fail to generate an input signal to the Reactor Protection System (RPS)
- RPV pressure peaks at 1106 psig until bypass valves regain pressure control
- APRM power peaks at 102%
- NO operator action has been taken

Which one of the following describes plant status following this event?

- A. All control rods inserted due to Alternate Rod Insertion actuation on high RPV pressure.
- B. All control rods inserted due to automatic RPS actuation on high RPV pressure.
- C. Control rods did NOT insert and reactor power will drop when reactor recirc speed limiter #2 activates.
- D. Control rods did NOT insert and reactor power will drop when BOTH reactor recirc pumps trip.

K&A # 295025 EK2.01
Importance Rating 4.1

QUESTION 42

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: RPS

Justification:

- A. Incorrect, the ARI automatic setpoint on high pressure has not been exceeded, and since the high pressure scram and BPVs function properly, ARI auto initiation will not occur. Candidates may select this if they incorrectly believe the ARI setpoint has been exceeded and do not recall that the RPS high pressure scram will actuate.
- B. Correct, RPV pressure has exceeded the scram setpoint for high RPV pressure, resulting in all rods in.**
- C. Incorrect, auto scram will occur on high pressure. No signal to initiate speed limiter 2 has occurred. Candidates may select this if they do not recall that the pressure transient will cause an automatic scram, and speed limiter 2 will not actuate.
- D. Incorrect, auto scram will occur on high pressure. No signal to occurred to cause recirc pumps to trip. Candidates may select this if they do not recall that the pressure transient will cause an automatic scram and recirc pumps will remain in service.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between high reactor pressure and RPS scram actuation setpoints.

References: TM-OP-058 Reference Required none

Learning Objective: 2486.a

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 6/7/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 43

A LOCA has occurred at Unit 1.

- The PCOP is operating Residual Heat Removal (RHR) pumps in LPCI mode to maintain RPV water level above -129”.
- NO other sources of injection to the RPV are available.
- A suppression pool (SP) leak then occurs resulting in RHR pump operation BELOW the RHR pump vortex limit.

The PCOP can expect to be directed to...

- A. stop injection and secure ALL RHR pumps until SP level can be restored.
- B. secure RHR pumps ONLY if SP temperature rises causing a further reduction in net positive suction head.
- C. continue RPV injection with RHR pumps, but limit RHR flow to LESS THAN 7000 gallons per minute.
- D. continue RPV injection with RHR pumps with NO restrictions.

K&A # 295030 EK2.04

Importance Rating 3.7

QUESTION 43

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following: RHR/LPCI

Justification:

- A. Incorrect, injection should not be stopped since RHR is required to ensure adequate core cooling. Candidates may select this if they incorrectly determine that exceeding vortex limits will preclude use of RHR for this purpose.
- B. Incorrect, a rise in SP temp may likely reduce RHR pump NPSH, however it is not evaluated in EOPs for the purpose of restricting RHR pump operation. Further, RHR pumps are required to assure adequate core cooling and may continue to inject without restriction per EOP guidance.
- C. Incorrect, unlike core spray, the RHR vortex limit is a straight line, below which any flowrate is not permitted, UNLESS RHR pumps are required to maintain RPV level. Candidates may select this if they incorrectly believe flow restrictions apply in this condition.
- D. **Correct, since RHR pumps are required for adequate core cooling this takes precedence over exceeding vortex limits, and RHR injection may continue without restriction.**

K/A Match Justification:

This question matches the stated K/A since candidates must recall the relationship between suppression pool level and operation of RHR pumps and correctly apply the procedural vortex limit.

References: EO-100-103 rev 9, EO-000-103 rev 7 Reference Required none

Learning Objective: 14616

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 11-14-10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 44

Unit 1 is operating at full power, when a steam line rupture occurs inside the drywell.

- Drywell temperature is 275°F, up fast
- Drywell pressure is 4.5 psig, up slow
- The crew has determined that drywell sprays are required

In this situation, which condition must the crew observe, AND why?

- A. Limit initial drywell spray flow to between 1000 and 2800 gpm to prevent excessive evaporative cooling that could damage primary containment internal components and structures.
- B. Do not start drywell sprays until suppression chamber pressure exceeds 13 psig to prevent excessive evaporative cooling that could damage primary containment internal components and structures.
- C. Limit initial drywell spray flow to between 1000 and 2800 gpm to prevent the cyclic condensation of steam at the downcomer openings of the drywell vents.
- D. Do not start drywell sprays until suppression chamber pressure exceeds 13 psig to prevent the cyclic condensation of steam at the downcomer openings of the drywell vents.

K&A # 295028 EK2.02

Importance Rating 3.2

QUESTION 44

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between HIGH DRYWELL TEMPERATURE and the following: Components internal to the drywell

Justification:

- A. **Correct, the spray flow limit is applicable in this instance and prevents an excessive evaporative cooling pressure drop that could challenge the drywell to suppression chamber dp limits, and damage primary containment components or structure.**
- B. Incorrect, While this statement is true, this limit is not applicable in this scenario, since the decision to spray is based solely on DW temperature trend. Candidates may select this if they incorrectly determine that DW sprays may not be initiated until Supp Chmbr pressure exceeds 13 psig.
- C. Incorrect, the cyclic steam condensation at the downcomer (chugging) is the reason drywell sprays are not started until 13 psig when spraying from the PC/P leg of the PC control EOP, and is N/A for this condition. Candidates may select this if they incorrectly determine that DW sprays may not be initiated until Supp Chmbr pressure exceeds 13 psig.
- D. Incorrect, drywell sprays should be started to limit the DW temperature excursion. The chugging phenomenon does not apply in this situation. Candidates may select this if they do not correctly recall the basis for the DW sprays flow limit.

K/A Match Justification:

This question matches the stated K/A since candidates must interrelate the potential for internal component damage with required actions taken to mitigate a high drywell temperature condition.

References: EPG rev 2, SSES-PSTG rev 8 Reference Required none

Learning Objective: 14613

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 5/26/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 45

Which one of the following describes the reason for the 'Drywell Pressure-High' function for the Reactor Protection System Instrumentation?

- A. Decrease the probability of exceeding primary containment design limits following a complete loss of drywell cooling.
- B. Prevent the loss of equipment inside the drywell needed for accident mitigation following a complete loss of drywell cooling.
- C. Prevent the loss of equipment inside the drywell needed for accident mitigation following a break in the Reactor Coolant Pressure Boundary.
- D. Decrease the probability of fuel damage following a break in the Reactor Coolant Pressure Boundary.

K&A # 295024 EK3.06
Importance Rating 4.0

QUESTION 45

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL PRESSURE : Reactor SCRAM

Justification:

- A. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- B. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- C. Incorrect, see below. Candidates may select this if they do not correctly recall the basis for the high drywell pressure scram.
- D. **Correct, per TSB 3.3.1.1; “High pressure in the drywell could indicate a break in the RCPB. A reactor scram is initiated to minimize the possibility of fuel damage and to reduce the amount of energy being added to the coolant and the drywell. The Drywell Pressure—High Function is assumed in the analysis of the recirculation line break (Ref. 6). The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of Emergency Core Cooling Systems (ECCS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.”**

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the reason for generating an automatic reactor scram following a high drywell pressure transient.

References: TSB 3.3.1.1 rev 4 Reference Required none

Learning Objective: 15970

Question source: INPO bank #21805, Perry 2001
NRC exam

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti 01/05/11

QUESTION 46

U1 is operating at rated power when the following events occur:

- An Appendix R fire occurs in the Upper Relay Room
- The Rx Scrams and the MSIVs close
- RPV level is +90 inches up fast
- RCIC injection flow rate is 700 gpm
- RCIC CANNOT be overridden
- HV-149-F008 and HV-149-F007 (RCIC Steam Supply Outboard and Inboard Isolation Valves) CANNOT be closed
- The Unit Supervisor directs the RPV to be promptly depressurized

Which one of the following states the correct reason for promptly depressurizing the RPV PRIOR TO RPV level EXCEEDING +118 inches?

- A. loss of the Main Condenser as a heat sink
- B. loss of the ability to operate SRVs
- C. potential RCIC Turbine damage
- D. potential SRV Tailpipe damage

K&A # 600000 AK3.04
Importance Rating 2.8

QUESTION 46

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to PLANT FIRE ON SITE: Actions contained in the abnormal procedure for plant fire on site

Justification:

- A. Incorrect, with MSIVs closed, the main condenser is not available. Candidates may select this if they believe that the high level condition will render the condenser unavailable. While this is likely true, it is not the procedural basis for this action.
- B. Incorrect: SRVs can still be manipulated if the Vessel is flooded. Candidates may select this if they believe that water in the steam lines may prevent SRVs from operating properly.
- C. **Correct, ON-013-001 Bases 5.6.B.5 states: "Fire outside of the Control Room could initiate RCIC and prevent it from being overridden or isolated. RCIC could then flood the RPV and the steam lines. A calculation has been performed that that proves that the SRV tailpipes will not be damaged by water or two phase flow. If RCIC cannot be isolated, however, damage to the RCIC Turbine could result. Therefore, operator action to override RCIC initiation, isolate RCIC or depressurize the RPV prior to level reaching 118" is required."**

Stem info states RCIC cannot be isolated, HV-149-F008 and HV-149-F007 cannot be closed therefore RPV level will continue to rise to 118".

- D. Incorrect: See above Bases, calculation proves no damage to SRV tailpipes. Candidates may select this if they believe this is the basis for the action.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the basis for actions contained in the fire on site abnormal procedure, ON-013-001, "Response To Fire".

References: ON-013-001 rev 28 Reference Required none

Learning Objective: 15310.b

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)10

Comments: Created by: D. Kelly, 12-22-10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 47

Complete the following statement regarding Bleeder Trip Valves:

Following a Main Turbine trip, Bleeder Trip Valves ____ (1) ____ in order to ____ (2) ____.

- A. (1) OPEN
(2) divert steam flow from the turbine to prevent a turbine overspeed.
- B. (1) SHUT
(2) prevent a turbine overspeed by stopping reverse steam flow from the feedwater heaters.
- C. (1) OPEN
(2) divert steam flow from the turbine to allow a faster turbine coastdown.
- D. (1) SHUT
(2) stop the flow of extraction steam to feedwater heaters to raise core inlet subcooling.

K&A # 295005 AK3.05
Importance Rating 2.5

QUESTION 47

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to MAIN TURBINE GENERATOR TRIP: Extraction steam/moisture separator isolations

Justification:

- A. Incorrect, BTVs are shut on a turbine trip because the residual steam will reverse and continue to turn the turbine. Candidates may select this if they incorrectly believe that NRVs open following turbine trip.
- B. **Correct, BTVs shut to prevent turbine overspeed caused by the steam from feedwater heaters reversing and continuing to drive the main turbine with no electrical load.**
- C. Incorrect, BTVs are shut on a turbine trip. Coastdown is related to friction created by turbine and generator bearings and main condenser vacuum, and will be relatively unaffected by extraction steam flow. Candidates may select this if they incorrectly believe that BTVs open following turbine trip.
- D. Incorrect, although RPV inlet temperature will indeed drop, the reason for stopping extraction steam to FW heaters is not related to core inlet subcooling since the reactor will be shutdown in this condition. Candidates may select this if they incorrectly recall the basis for isolating BTVs after turbine trip.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the basis for isolating extraction steam following a main turbine trip.

References: TM-OP-093 rev 10 Reference Required none

Learning Objective: 1614.f

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: *TM-OP-093 refers to NRVs as "Extraction Steam Non-Return Valves"; OP-193-001 refers to NRVs as "Bleeder Trip Valves" therefore **BOTH** terms are included in the question stem.* Created by: T. North, 5/26/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 48

Unit 1 has experienced a LOCA resulting in entry into EO-100-102, RPV Control, and EO-100-103, PC Control.

The following conditions exist:

- Suppression Pool level is 20 feet and steady
- The PCOP is controlling RPV pressure using Safety Relief Valve manual operation, resulting in rising suppression pool temperature

The Unit Supervisor directs the PCOP to report suppression pool temperature.

Which one of the following describes the instrumentation available to the PCOP to accurately determine Suppression Pool temperature?

- A. SPOTMOS Division 2 lower RTDs ONLY.
- B. SPOTMOS Division 1 average temperature ONLY.
- C. PICSY Division 1 and 2 Bulk Temperature A (MAT 37).
- D. SPOTMOS Division 1 lower RTDs ONLY.

K&A # 295026 EA1.03
Importance Rating 3.9

QUESTION 48

RO Tier 1 Group 1

K&A Statement:

Ability to operate and/or monitor the following as they apply to
SUPPRESSION POOL HIGH WATER TEMPERATURE:
Temperature monitoring

Justification:

- A. Incorrect, there are no Division 2 lower sensors. Candidates may select this if they do not correctly recall which division has the lower sensors.
- B. Incorrect, these sensors will not be submerged and will not provide an accurate value. Candidates may select this if they do not correctly recall which temperature indicators are accurate with low SP level.
- C. Incorrect, this computer data utilizes sensors that are not submerged, therefore will not be accurate. Candidates may select this if they do not correctly recall which temperature indicators are accurate with low SP level.
- D. **Correct, the sixteen RTDs are located near the water surface at a level of 20.5 feet above Suppression Pool bottom. Normal Suppression Pool operating level is 23 feet - minimum level is 22 feet. For Division I only, four additional RTDs provide input to SPOTMOS. These RTDs (TE-15751, TE-15756, TE-15761, and TE-15764) are located deep in the pool, three feet above Suppression Pool bottom.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine which SP level monitoring indication is appropriate with high SP temp and low SP level.

References: TM-OP-059Z rev 5 Reference Required None

Learning Objective: 330.a

Question source: SSES OPS_INITIAL_LICENSE
Bank #TMOP059Z/330 003

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created/Modified by: T. North 12/23/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 49

Unit 1 has experienced an accident resulting in fuel damage and a radioactive release via the Turbine Building Stack.

- All unit 1 SPING field units are UNAVAILABLE due to a loss of Instrument AC panel 1Y219

Which one of the following describes the use of the Post Accident Vent Stack Sampling System (PAVSSS) in this condition:

The PAVSSS ...

- A. CANNOT be utilized to monitor the release, since the PAVSSS field units can ONLY be used to monitor the Reactor Building Stack.
- B. CAN be utilized to monitor the release and can provide BOTH noble gas AND particulate concentrations.
- C. CAN be utilized to monitor the release but can ONLY provide noble gas concentration.
- D. CANNOT be utilized to monitor the release since the PAVSSS field units can ONLY be used to monitor the Standby Gas Treatment Exhaust.

K&A # 295038 EA1.05
Importance Rating 3.0

QUESTION 49

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE: Post accident sample system (PASS): Plant-Specific

Justification:

- A. Incorrect, the PAVSSS can only monitor the TB stack and SGTS vent. Candidates may select this if they do not correctly recall the purpose and function of PAVSSS monitors.
- B. Incorrect, the PAVSSS cannot monitor particulate concentrations. Candidates may select this if they do not correctly recall the purpose and function of PAVSSS monitors.
- C. **Correct, the PAVSSS is designed to be a backup to the SPING under accident conditions and its ability to monitor the stack release will not be affected by the power loss. It can only provide noble gas concentration.**
- D. Incorrect, the PAVSSS stack monitoring components will not be affected by the loss of 1Y219. Candidates may select this if they do not correctly recall the power supply to PAVSSS monitors.

K/A Match Justification:

This question matches the stated K/A since candidates must recall facts regarding use and response of PAVSSS monitors during a high off site release event.

References: TM-OP-079Z rev 4 Reference Required none

Learning Objective: 10396.b

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 9/19/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 50

Unit 1 is in a refueling outage. Unit 2 is at full power. A refueling accident has occurred on 818' level resulting in the following annunciators alarming on Unit 1:

- REFUEL FLOOR WALL EXH HI RADIATION [AR-112-001 (D1)]
- REFUEL FLOOR WALL EXH HI-HI RADIATION [AR-101-001 (A5)]

Which one of the following describes the Standby Gas Treatment (SGTS) system response (if any) to the event?

- A. BOTH SGTS trains start and align to Zone III.
- B. BOTH SGTS trains start and align to Zone I AND Zone III.
- C. ONLY ONE SGTS train starts and aligns to Zone III.
- D. NO SGTS trains start and ventilation remains in a normal lineup.

K&A # 295023 AA1.07
Importance Rating 3.6

QUESTION 50

RO Tier 1 Group 1

K&A Statement:

Ability to operate and/or monitor the following as they apply to
REFUELING ACCIDENTS : Standby gas treatment

Justification:

- A. **Correct, the high high refuel floor wall rad monitor setpoint has been exceeded and results in the auto start of BOTH SGTS trains, since their control switches are both in Lead, and alignment to Zone 3 only.**
- B. Incorrect, SGTS aligns to Zone 3. Candidates may select this if they do not correctly recall that SGTS aligns only to Zone 3 upon this initiation signal.
- C. Incorrect, both SGTS trains start. Candidates may select this if they do not recall that both SGTS fan control switches are in Lead, unlike CREOASS.
- D. Incorrect, SGTS auto start will occur. Candidates may select this if they do not correctly recall that SGTS will start and align to Zone 3 following only the refuel floor wall hi-hi rad.

K/A Match Justification:

This question matches the stated K/A since candidates must correctly recall the SGTS system response in order to properly monitor SGTS automatic action following the annunciators.

References: TM-OP-070 rev 5 Reference Required none

Learning Objective: 1991

Question source: SSES NRC Bank #6

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti 01/05/11

QUESTION 51

Unit 1 was operating at full power when a LOCA concurrent with a loss of all high pressure feed occurred resulting in the following conditions:

- RPV level is -208", steady
- NO RHR pumps are available
- Core Spray loop A is injecting to the RPV at 6500 gpm
- Core Spray loop B is NOT injecting to the RPV
- RPV pressure is 75 psig, down slow
- 6 ADS SRVs are open
- RPV injection has been maximized using ALL available systems

Which one of the following statements describes the status of Adequate Core Cooling, and why?

- A. Adequate Core Cooling is NOT assured;
RPV Water level is below -205".
- B. Adequate Core Cooling IS assured;
Core Spray loop A flow is above 6350 gpm
- C. Adequate Core Cooling is NOT assured;
Core Spray loop B flow is below 6350 gpm.
- D. Adequate Core Cooling IS assured;
RPV pressure is above the Minimum Steam Cooling Pressure.

K&A # 295031 EA2.04
Importance Rating 4.6

QUESTION 51

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
REACTOR LOW WATER LEVEL : Adequate core cooling

Justification:

- A. Incorrect, adequate core cooling IS assured even though RPV level is below -2-5" since CS A is injecting >6350 gpm. The candidate may choose this if they incorrectly believe that ACC cannot be assured when level is below -205" with injection flow present.
- B. **Correct, with RPV level below -161" but above -210", adequate core cooling can only be assured by spray cooling...at least one CS loop above design flow of 6350 gpm**
- C. Incorrect, ACC IS assured. Core spray flow needs to be ≥ 6350 gpm in at least one loop alone. As long as CS A is >6350 gpm, CS B flow is not required to assure ACC. The candidate may choose this if they incorrectly believe that both CS loops must be injecting to assure ACC.
- D. Incorrect, The MSCP value only applies during ATWS conditions when RPV level is undetermined. In this case MSCP is irrelevant and does not factor into ACC determination. The candidate may choose this if they incorrectly believe that MSCP is a relevant determinant to ACC.

K/A Match Justification:

This question matches the stated K/A since candidates are required to evaluate current plant conditions with RPV water level below TAF to determine if adequate core cooling can be assured.

References: EO-000-102 rev 8 Reference Required none

Learning Objective: 14591

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 12/15/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 52

Unit 1 is at 100% power when a leak develops in the Reactor Building Chilled Water (RBCW) discharge piping.

If RBCW flow continues to degrade due to the leak with NO operator action, determine which one of the following describes the Reactor Building Closed Cooling Water (RBCCW) system response:

- A. RBCCW will provide cooling flow to the RBCW drywell loads ONLY IMMEDIATELY AFTER RBCW drops below 1 psid.
- B. RBCCW will provide cooling flow to the RBCW drywell loads ONLY, AFTER RBCW drops below 1 psid for 13 seconds.
- C. RBCCW flow to the Reactor Water Cleanup NON-regenerative Heat Exchanger (NRHX) ISOLATES IMMEDIATELY AFTER RBCW drops below 1 psid.
- D. RBCCW will provide cooling flow to ALL RBCW loads AFTER RBCW drops below 1 psid for 13 seconds.

K&A # 295018 AA2.04
Importance Rating 2.9

QUESTION 52

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING
WATER : System flow**

Justification:

- A. Incorrect, RBCCW assumes cooling flow to the RBCW drywell loads after a 13 second time delay. Candidates may select this if they do not correctly recall the details of the low flow transfer signal.
- B. **Correct, the flow degradation will result in transfer of cooling for RBCW drywell loads to RBCCW 13 seconds after RBCW flow drops below 1 psid. RBCCW flow to the NRHX will also be isolated by this signal.**
- C. Incorrect, RBCCW cooling to the NRHX will isolate upon the low RBCW system flow signal after a 13 second time delay. Candidates may select this if they do not correctly recall the time delay portion of system response.
- D. Incorrect, RBCCW will provide flow only to drywell RBCW loads. Candidates may select this if they incorrectly believe that RBCCW will assume all RBCW loads.

K/A Match Justification:

This question matches the stated K/A since candidates must determine how a reduction in RBCW system flow will impact the RBCW and RBCCW systems.

References: TM-OP-014 rev 3, TM-OP-300 rev 3, Reference Required none
ON-134-001 rev 26

Learning Objective: 1694.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)10

Comments: Created by: T. North, 10/18/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 53

Unit 1 was operating at full power when a control room fire occurred requiring evacuation of the control room in accordance with ON-100-009, "Control Room Evacuation".

- The control room has been successfully evacuated
- All remote shutdown panel transfer switches have been repositioned
- NO systems, structures or components have been damaged as a result of the fire
- RPV pressure is 1040 psig, steady
- RPV level is +35", steady

Direction has been given to depressurize the RPV per ON-100-009.

Given ON-100-009 attachments A and B, which one of the following is the CORRECT action operators should take to accomplish this?

- A. ADS SRVs G, J, K, L, M, or N should be operated from the Upper Relay Room to reduce RPV pressure to LESS THAN 100 psig as soon as possible to allow RHR to be placed in Shutdown Cooling.
- B. ADS SRVs G, J, K, L, M, or N should be operated from the Upper Relay Room to reduce RPV pressure to NO LESS THAN 400 psig over the next hour.
- C. SRVs A, B or C should be operated from the Remote Shutdown Panel to reduce RPV pressure to LESS THAN 100 psig as soon as possible to allow RHR to be placed in Shutdown Cooling.
- D. SRVs A, B or C should be operated from the Remote Shutdown Panel to reduce RPV pressure to NO LESS THAN 400 psig over the next hour.

K&A # 295016 AA2.03
Importance Rating 4.3

QUESTION 53

RO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
CONTROL ROOM ABANDONMENT : Reactor pressure

Justification:

- A. Incorrect, ADS valves should only be operated if SRVs A, B and C are unavailable. No condition is present allowing the CDR to be exceeded. Candidates may select this if they incorrectly determine that CDR may be exceeded and SRVs A,B and C may be used.
- B. Incorrect, ADS valves should only be operated if SRVs A, B and C are unavailable. Candidates may select this if they incorrectly determine that SRVs A,B and C may be used.
- C. Incorrect, No condition is present allowing the CDR to be exceeded. Candidates may select this if they incorrectly determine that CDR may be exceeded.
- D. **Correct, ON-100-009 directs operators to cooldown using SRVs A, B, and C. The cooldown should be conducted less than 100°F/hr since there is no condition present requiring RD or anticipation of RD. Limiting the pressure drop to 400 psig over the next hour keeps CDR below TS limits.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the change in pressure necessary to depressurize in accordance with the procedure provided and within required limits.

References: ON-100-009 rev 21

Reference Required: ON-100-009 Att A & B

Learning Objective: 15306, 15307

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 6/24/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 54

Unit 1 is in MODE 5, with RHR pump "A" in Shutdown Cooling (SDC).

A leak develops on the "A" RHR pump suction piping resulting in rising water level in the "A" RHR pump room, and lowering reactor cavity water level.

- AR-109-001 (H08), "RHR LOOP A PUMP ROOM FLOODED", alarm is illuminated
- Operators manually close the SDC inboard and outboard isolation valves PRIOR to reaching the SDC auto isolation signal on low RPV water level
- RPV water level stabilizes at +15"
- The leakage stops when the SDC isolation valves are shut

Which one of the following identifies the procedures that REQUIRE IMMEDIATE ENTRY?

- A. ON-149-001, "Loss of RHR Shutdown Cooling Mode" ONLY
- B. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-104, "Secondary Containment Control", ONLY
- C. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-102, "RPV Control", ONLY
- D. ON-149-001, "Loss of RHR Shutdown Cooling Mode"; AND EO-100-102, "RPV Control"; AND EO-100-104, "Secondary Containment Control"

K&A # 295021 2.4.1

Importance Rating 4.6

QUESTION 54

RO Tier 1 Group 1

K&A Statement:

Emergency Procedures / Plan: Knowledge of EOP entry conditions and immediate action steps.

Justification:

- A. Incorrect, SC Control EOP requires entry. Candidates may select this if they do not recognize the SC Control EOP entry.
- B. Correct, SC Control EOP requires entry on hi level in the RHR pump room. No entry condition exists for RPV Control.**
- C. Incorrect, No entry for RPV control, SC Control entry exists on hi RHR pump room level. Candidates may select this if they do not recognize the SC Control EOP entry and incorrectly determine RPV Control must be entered.
- D. Incorrect, No entry for RPV control. Candidates may select this if they incorrectly determine RPV Control must be entered.

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate current conditions and determine which EOP entry conditions have been met. *Boiling Water Reactor EOPs do not have "immediate action steps" since all actions must be directed by the Control Room Supervisor after carefully evaluating plant status. Therefore, the immediate action steps portion of the K/A was not addressed.*

References:	EO-000-102 rev 8, 104; ON-149-001 rev 23	Reference Required	None
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Learning Objective: 14585

Question source: New

Question History: New

Cognitive level:	Memory/Fundamental knowledge:
	Comprehension/Analysis: X

10CFR55 41(b)10

Comments: <i>At SSES, EOPs do not have immediate action steps.</i>	Created by: T. North, 6/9/10
	Reviewed by: M. Jacopetti 01/05/11

QUESTION 55

1 per telecom JLC 1/24/11
A Unit 2 startup is in progress. The reactor is critical and power is in the source range with an infinite period.

The 1D673 +24VDC Battery Charger fails, resulting in NO output from the charger.

Assuming NO operator action, how will the plant respond?

- A. The +24VDC bus will be initially energized by the battery. As the battery discharges, power will be lost to Process Rad Monitors, A & C SRMs and A/C/E/G IRMs. A half scram will occur.
- B. The +24VDC bus will be energized by the -24VDC Battery Charger 1D674. No loss of power will occur.
- C. Power will be immediately lost to the +24VDC bus supplying Process Rad Monitors, A & C SRMs and A/C/E/G IRMs. A half scram will immediately occur.
- D. The +24VDC bus will be initially energized by the battery. As the battery discharges, the -24VDC Battery Charger 1D674 will continue to charge the battery, thus maintaining power to the bus.

K&A # 295004 AK2.01

Importance Rating 3.1

QUESTION 55

RO Tier 1 Group 1

K&A Statement:

Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF D.C. POWER and the following: Battery Charger

Justification:

- A. **Correct, The battery will initially carry the load but will discharge without the charger.**
- B. Incorrect, The -24VDC charger cannot carry the +24VDC bus. If the candidate believes that either of the chargers can carry the entire bus, this answer will be chosen.
- C. Incorrect, the battery will carry the loads as it discharges. If the candidate does not understand that the battery directly ties to the bus and will carry it, this answer will be chosen.
- D. Incorrect, The -24VDC charger will not charge the +24VDC battery The two busses each have their own battery and charger The charger cannot carry the other bus's battery. If the candidate believes that this is possible then this answer will be chosen.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of battery charger and DC bus response following failure of a battery charger.

References: TM-OP-075 rev 2

Reference Required none

Learning Objective: 10102

Question source: SSES NRC Exam Bank

Question History: SSES 2004 NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/05/11

QUESTION 56

Unit 1 is in MODE 4 with preparations for a reactor startup in progress.

A seismic event occurs resulting in a complete loss of instrument air and a small LOCA inside the drywell.

Given the following plant conditions:

- RPV level is +5", down slow
- Condensate system was in long path recirc prior to the seismic event

Which one of the following statements is CORRECT regarding the RPV level control strategy?

Condensate pumps...

- A. CANNOT be used to feed the RPV because the Condensate Pump Discharge Valves have failed shut.
- B. CAN be used to feed the RPV, BUT FLOW CANNOT BE THROTTLED since The Low Load Flow Control and the Low Load Bypass Valves have FAILED SHUT.
- C. CAN be used to feed the RPV since the air loss will NOT affect the low load flow control and bypass valves.
- D. CANNOT be used to feed the RPV since the Short Path Recirc AND Feed Pump Min Flow Recirc valves have FAILED OPEN.

K&A # 295019 2.4.9

Importance Rating 3.8

QUESTION 56

RO Tier 1 Group 1

K&A Statement:

Loss of Instrument Air:

Emergency Procedures / Plan: Knowledge of low power / shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.

Justification:

- A. Incorrect, condensate pump discharge valves are motor operated and will not be affected by the air loss. Candidates may select this if they do not correctly recall this fact.
- B. Incorrect, condensate will be unavailable due to the short path recirc and disch vents open. Long path recirc valves also fail open. Candidates may select this if they do not correctly recall these facts.
- C. Incorrect, the low load FCV and bypass valve fail shut on loss of air. Candidates may select this if they do not correctly recall this fact.
- D. **Correct, the loss of IA will result in the short path and RFP min flow recirc valves failing open preventing the use of condensate pumps in this condition.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine how the loss of air impacts EOP mitigating strategies during shutdown conditions.

References: ON-118-001 rev 23, TM-OP-044 rev 8, Reference Required none
-045 rev 13

Learning Objective: 1823.a

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 6/21/10
Reviewed by: M. Jacopetti 01/05/11

QUESTION 57

Both units are operating at full power when a fire in the control structure requires abandonment of BOTH control rooms.

ALL required actions are taken prior to leaving the control room.

Prior to transferring control to the Remote Shutdown Panels, a complete loss of ALL offsite power occurs, AND;

UNIT 1 "B" ESS bus (1A202) LOCKS OUT due to a ground fault.

In order to support placing **UNIT 1** RHR in suppression pool cooling (SPC), assuming all plant areas are accessible for manual valve manipulation if necessary, the crew MUST:

- A. Start the 1A RHR pump AND the 1A RHRSW pump from the Remote Shutdown Panel.
- B. Locally close the 1D RHR pump breaker, AND start the 1BRHRSW pump from the Remote Shutdown Panel.
- C. Locally close the 1A RHR pump AND the 1ARHRSW pump breakers.
- D. Locally close the 1D RHR pump AND the 1BRHRSW pump breakers.

Importance Rating

QUESTION 57**RO Tier 1 Group 1**

K&A Statement:

Ability to operate and/or monitor the following as they apply to
CONTROL ROOM ABANDONMENT : A.C. electrical distribution

Justification:

- A. Incorrect, 1A RHR pump operation is not available from the unit 1 RSP, it is ONLY available in unit 2. Candidates may select this if they confuse the availability of RHR pumps between unit RSPs.
- B. Correct, the loss of the 1B ESS bus renders control of the 1B RHR pump unavailable. U1 RSP can only control the 1B RHR pump and 1B RHRSW pumps. SPC can be placed in service using the 1D RHR pump and 1B RHRSW pump. Operation of the 1B RHRSW pump and associated valves are unaffected by the 1B ESS bus loss since they are powered by the 1D ESS bus, which will be energized by the D EDG.**
- C. Incorrect, the 1A RHR pump breaker cannot be closed since U2 will be using the 2A RHR pump from the U2 RSP. Candidates may select this if they do not recall that the 1A RHR pump is interlocked to prevent its operation when the 2A RHR pump is in operation.
- D. Incorrect, the 1B RHRSW pump is still available and can be operated from the U1 RSP since it is powered by the 1D ESS bus. The 1B RHRSW pump can be operated from the RSP and has power from the 1D ESS bus, therefore local operation of its breaker is not necessary and would place NLOs at risk. Candidates may select this if they believe the 1B RHRSW pump is only available by locally operating its breaker.

K/A Match Justification:

This question matches the stated K/A since candidates must determine how limited AC distribution availability affects operation during control room abandonment.

References: ON-100-009 rev 21, TM-OP-049 rev 7, Reference Required none
TM-OP-016 rev 8

Learning Objective: 15310.d

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 12/21/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 58

Unit 1 is operating at full power when disturbances in the electrical grid result in entry into ON-198-001, "Unit 1 Main Generator MVAR Control For Auto Voltage Regulator Operation When Synched To Grid".

Given the data obtained by the crew and recorded on ON-198-001, page 3, and attachment "A", "Main Generator Reactive Capability Curve":

(the data obtained was taken 5 minutes ago, and is unchanged)

Determine the CORRECT action for this condition AND why:

- A.
 - RAISE GENERATOR MW OUTPUT;
 - This will cause a corresponding reduction in reactive load to within the capability curve.

- B.
 - RAISE GENERATOR EXCITATION;
 - This will raise the allowable reactive load by increasing the lagging power factor.

- C.
 - REDUCE GENERATOR EXCITATION;
 - This will reduce the reactive load to within the capability curve.

- D.
 - REDUCE HYDROGEN GAS PRESSURE;
 - This will shift the capability curves to allow additional reactive load.

K&A # 700000 AK3.02
Importance Rating 3.6

QUESTION 58

RO Tier 1 Group 1

K&A Statement:

Knowledge of the reasons for the following responses as they apply to GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES: Actions contained in abnormal operating procedure for voltage and grid disturbances.

Justification:

- A. Incorrect, raising generator MW would not be permissible in this case since it would require exceeding reactor license MWth limit. Additionally, this action would not have the desired effect, and would bring conditions further outside the capability curve. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.
- B. Incorrect, raising generator excitation would raise generator voltage and thereby raise the reactive load further outside the capability curve. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.
- C. **Correct, since the combination of reactive load and MW output exceed the capacity curve, reducing generator excitation will reduce generator voltage and the corresponding reactive load will be reduced. This action is directed by the ON to bring reactive load to within the capability curve.**
- D. Incorrect, reducing generator gas pressure would make reactive load limits more restrictive since generator cooling capability would be reduced, and is not a desired action in this case. Candidates may select this if they do not fully understand the actions required to maintain generator parameters within the capability curve.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of the reasons why actions required by the off normal procedure are taken following grid disturbances.

References: ON-198-001 rev 12, TM-OP-098 rev 5 Reference Required ON-198-001 page 3 of 16 with data, and attachment A

Learning Objective: 15306, 15307, 15318

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)4,5,7,10

Comments: Created by: T. North, 7/3/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 59

OSCAR has been dispatched as a result of a refueling accident on the refuel floor (818'). The Standby Gas Treatment System (SGTS) automatically initiates. The following conditions exist:

- Zone 1 and III differential pressure is -0.31 inches WG.
- SGTS SPING Noble Gas is 1.0E06 micro curies per minute.
- OSCAR whole body dose readings are 0.05 mRem/hour.

A siding panel fails on the Refuel Floor. Zone III differential pressure now indicates 0 inches WG.

- (1) How do SPING readings relate to the offsite release rate; AND
- (2) How will OSCAR whole body dose readings respond to the panel failure?
- A. (1) SBTG SPING Noble Gas IS representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will NOT change.
- B. (1) SBTG SPING Noble Gas IS representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.
- C. (1) SBTG SPING Noble Gas is NOT representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will NOT change.
- D. (1) SBTG SPING Noble Gas is NOT representative of the Total Offsite Release.
(2) OSCAR whole body dose readings will increase.

K&A # 295035 EK1.01
Importance Rating 3.9

QUESTION 59

RO Tier 1 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE: Secondary Containment Integrity

Justification:

- A. Incorrect, the SC integrity failure results in a release bypassing SGTS and causing dose rates to rise. Candidates may select this if they do not consider the impact of the SC siding failure.
- B. Incorrect since the SC integrity failure causes SGTS to be bypassed resulting in SGTS SPING readings not indicative of total release rates. Candidates may select this if they do not consider the impact of the SC siding failure.
- C. Incorrect, OSCAR readings will rise as release rate increases. Release rate increases through the siding failure. Candidates may select this if they do not consider the impact of the SC siding failure.
- D. **Correct, with SC integrity no longer intact, and dP high, radioactive material released due to the refueling accident will bypass SGTS and cause site dose rates as indicated by OSCAR to rise.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the operational impact due to the rise in offsite dose following a secondary containment failure due to a rise in secondary containment pressure.

References: TM-OP-034 rev 7 Reference Required none

Learning Objective: 1266.a, b

Question source: SSES NRC Exam Bank #650

Question History: SSES 2005 NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)8

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti 01/06/11

QUESTION 60

Unit 1 is operating in MODE 1 with reactor power at 75%. A primary leak into secondary containment is in progress.

Radiation levels in the reactor building are rising, with the following Area Radiation Monitor indications:

- ARM channel 50, "CRD NORTH" indicates 2×10^4 MR/HR
- ARM channel 52. "RWCU RECIRC PP ACC" indicates 3×10^4 MR/HR
- All other ARM channels are reading between 100 and 500 MR/HR

Refer to EO-100-004, "Secondary Containment Control", table 9 below and determine which one of the following describes the impact of these conditions on plant operation:

TABLE 9
REACTOR BUILDING RADIATION

RB AREA EL (FT)	ARM NUMBER		ARM CHANNEL DESCRIPTION	MAX NORMAL RADIATION FIELD	MAX SAFE RADIATION FIELD	EO104	RB RAD (R/HR)	
	LO RANGE	HIGH RANGE		(MR/HR)	(R/HR)			
818	35+	N/A	CASK STOR AREA	HI ALARM	10^4	10		
	14+	N/A	SPENT FUEL CRIT MON					
	15*	N/A	REFUEL FLOOR NORTH					
	42+	N/A	REFUEL FLOOR WEST					
	47*	N/A	SPENT FUEL CRIT MON					
	N/A	49	REFUEL FLOOR AREA					
749	8+	52	RWCU RECIRC PP ACC					
	10*	54	FUEL POOL PP AREA	HI ALARM	10^4	10		
	11+	N/A	RX BLD SAMPLE ST					
719	5*	50	CRD NORTH					
	6*	51	CRD SOUTH	HI ALARM	10^4	10		

The crew is required to insert a reactor scram AND...

- A. stabilize RPV pressure below 1087 psig.
- B. perform Rapid Depressurization.
- C. anticipate Rapid Depressurization.
- D. force a cooldown of the RPV within limits.

K&A # 295033 EK2.01
Importance Rating 3.8

QUESTION 60

RO Tier 1 Group 2

K&A Statement:

Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS : Area radiation monitoring system

Justification:

- A. Incorrect, a rapid depressurization using ADS is also required. Candidates may select this if they do not recall that 2 areas above max safe values requires RD with a primary leak in to SC.
- B. **Correct, scram AND RD with ADS valves are both required since 2 ARMs from 2 separate areas are reading above max safe values and a primary system is discharging into a reactor building area.**
- C. Incorrect, depressurization may not be performed with BPVs in this case since conditions requiring RD with ADS valves are met. The candidate may select this if they do not recall that use of BPVs is not permitted.
- D. Incorrect, RD exceeding cooldown rates is required. The candidate may select this if they confuse actions required when rad levels are caused by conditions other than a primary leak into SC.

K/A Match Justification:

This question matches the stated K/A since candidates are required to determine the impact on plant operation of area rad monitor readings above max safe values.

References: EO-100-104, rev 7, EO-000-104, rev 6 Reference Required none

Learning Objective: 14586.m, 14594

Question source: INPO Bank #22275

Question History: Nine Mile Point U2 2002 NRC exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 8/31/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 61

Unit 1 was operating at full power when an ATWS occurred due to an electrical failure of the Reactor Protection System and the Alternate Rod Insertion System.

- All control rods are at position 48.
- MSIVs are shut

In this case the Rod Worth Minimizer should be (1) because (2) .

- A. (1) left in NORMAL
(2) control rods must be manually inserted using the loaded shutdown sequence.
- B. (1) left in NORMAL
(2) its operation will not impact electrical ATWS control rod insertion strategies.
- C. (1) BYPASSED
(2) control rod blocks may occur due to inserting rods in an abnormal pattern.
- D. (1) BYPASSED
(2) the loss of steam flow signal may enable rod pattern enforcement at a higher power than is required.

K&A # 295015 AK3.01
Importance Rating 3.4

QUESTION 61

RO Tier 1 Group 2

K&A Statement:

Knowledge of the reasons for the following responses as they apply to INCOMPLETE SCRAM : Bypassing rod insertion blocks

Justification:

- A. Incorrect, the ATWS rod insertion strategy requires inserting intermediate rods first, then full out rods. In this situation all rods are full out so one option would be to use the shutdown sequence, however, it is not required. Candidates may select this if they believe they do not need to bypass the RWM as long as they follow the shutdown sequence.
- B. Incorrect, even though the ATWS is electrical, the RWM may apply rod blocks due to abnormal rod insertion patterns if manual insertion becomes required. Candidates may select this if they believe that the electrical ATWS only requires strategies not impacted by the RWM.
- C. **Correct, the RWM rod block features are enabled only when power is below the LPSP. These features may enforce a control rod insert block if rods are selected that are not in accordance with the loaded sequence. The RWM must be manually bypassed to ensure that rod blocks are not activated when rod insertion is attempted.**
- D. Incorrect, RWM rod pattern enforcement is not required in an ATWS at any power. Candidates may select this if they believe that use of the RWM enforced pattern may be required at lower powers.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the conditions that provide the basis for bypassing the rod worth minimizer and its related rod insertion blocks under incomplete scram conditions.

References: EO-000-113 rev 8, TM-OP-031D rev 4 Reference Required none

Learning Objective: 14613

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created by: T. North, 12/20/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 62

Unit 1 is operating at full power with the "A" EHC Pressure Regulator controlling pressure.

Complete the statement below that describes the expected response of EHC, and the plant, if the "A" Pressure Averaging Manifold (throttle) Pressure Transmitter fails to 0 psig output.

RX pressure will (1) , and (2) .

- A. (1) RISE
(2) EHC pressure regulator "B" takes control, limiting the pressure rise to about 3 psig.

- B. (1) RISE
(2) the reactor will scram on high pressure or high neutron flux.

- C. (1) LOWER
(2) EHC Pressure Regulator "B" takes control, limiting the pressure drop to about 3 psig.

- D. (1) LOWER
(2) the reactor scrams when the MSIVs close on low pressure.

K&A # 295007 AA1.05
Importance Rating 3.7

QUESTION 62

RO Tier 1 Group 2

K&A Statement:

Ability to operate and/or monitor the following as they apply to
HIGH REACTOR PRESSURE : Reactor/turbine pressure
regulating system

Justification:

- A. Correct, since the failure will call for a “raise pressure” signal from the A pressure regulator, pressure will initially rise. As the A regulator output signal lowers (raise pressure signal), eventually it will be lower than the B regulator’s output signal, resulting in the B signal taking control due to the “high value gate” in the control circuit. Since B is set to control \approx 3psig higher than A, RPV pressure will stabilize about 3 psig higher.**
- B. Incorrect, see explanation above. Candidates may select this if they do not recall that the high value gate will eventually select the B regulator and stabilize pressure.
- C. Incorrect, this failure will cause pressure to rise. The B regulator is set to control higher than the A. Candidates may select this if they confuse this response with a downscale failure of the A regulator, and that the B regulator will assume control.
- D. Incorrect, this failure will cause pressure to rise. Candidates may select this if they confuse this response with a downscale failure of the A REGULATOR which would cause this result.

K/A Match Justification:

This question matches the stated K/A since candidates are required to evaluate plant conditions to determine the correct response of the reactor/turbine pressure regulating system.

References: TM-OP-093 rev 9, -093L rev 6 Reference Required none

Learning Objective: 1641.o

Question source: Bank

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/06/11

QUESTION 63

The Unit 1 Reactor Building Stack Monitor Panel - Rad Measurement 1C216B (29-818') alarm horn has actuated AND the Green High light is illuminated.

Which one of the following identifies a source of airborne radioactivity that would result in this panel alarming?

- A. Unit 1 Main Steam Pipe Tunnel Cooler Exhaust.
- B. Standby Gas Treatment Exhaust.
- C. Zone 2 Ventilation Exhaust.
- D. Unit 1 Zone 3 Ventilation Exhaust.

K&A # 295034 EA2.02

Importance Rating 3.7

QUESTION 63

RO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**SECONDARY CONTAINMENT VENTILATION HIGH
RADIATION : Cause of high radiation levels**

Justification:

- A. incorrect – although the steam tunnel is part of the reactor building, its ventilation system does not discharge to the RB. It is a room cooler that simply circulates air. Candidates may select this if they believe that the steam tunnel HVAC exhausts to the RB.
- B. incorrect - would alarm SBGT stack alarm. Candidates may select this if they are unfamiliar with the potential causes of local radiation alarms.
- C. incorrect - would alarm U2 stack alarm. Candidates may select this if they are unfamiliar with the potential causes of local radiation alarms.
- D. **Correct, Unit 1 zone 3 ventilation exhausts thru unit 1 reactor building stack.**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the cause of the secondary containment high radiation alarm.

References: TM-OP-034 rev 7, TM-OP-079Z rev 4 Reference Required none

Learning Objective: 1942.a

Question source: INPO Bank # 23810

Question History: SSES 2002 NRC Exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)10

Comments: Created by: Bank
Reviewed by: M. Jacopetti 01/06/11

QUESTION 64

Unit 1 has experienced an accident requiring Primary Containment Flooding.

- The Suppression Pool Wide Range Level indicator indicates full upscale
- Primary Containment water level is thought to be approximately 55 feet

The PCOP has been directed to determine Primary Containment water level in accordance with ON-159-003, "Primary Containment Water Level Anomaly".

In order to accomplish this PCOP must...

- A. Plot drywell pressure on the containment level vs. drywell pressure graph ONLY
- B. Calculate the drywell to suppression chamber D/P, then plot the D/P on the containment level vs. D/P graph ONLY
- C. Ensure the drywell has been vented to atmosphere, calculate the drywell to suppression chamber D/P, then plot D/P on the containment level vs. D/P graph.
- D. Ensure the drywell has been vented to atmosphere, then plot drywell pressure on the containment level vs. drywell pressure graph.

K&A # 295029 2.1.23

Importance Rating 4.4

QUESTION 64

RO Tier 1 Group 2

K&A Statement:

High Suppression Pool Level:

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Justification:

- A. Incorrect, drywell pressure plot is only used when >64', and the DW must be vented to utilize this method. Candidates may select this incorrectly apply actions required under other conditions.
- B. **Correct, with PC level between 49 and 64 feet, ON-159-003, Primary Containment Water Level Anomaly, directs operators to calculate the dP between supp chamber and DW, then plot the dP on the graph provided in attachment A.**
- C. Incorrect, ensuring the DW is vented is not required for this calculation since PC pressure above atmosphere will affect both supp chamber pressure and DW pressure readings equally. Venting the DW is only required when PC level is >64' . Candidates may select this incorrectly apply actions required under other conditions.
- D. Incorrect, this action would only be correct if PC level is above 64'. Candidates may select this incorrectly apply actions required under other conditions.

K/A Match Justification:

This question matches the stated K/A since candidates must possess the ability to perform required procedural actions during a high drywell temperature transient.

References: ON-159-003 rev 7

Reference Required

none

Learning Objective:

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 12/22/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 65

Unit 1 was operating at full power when a false High Drywell Pressure signal was received, resulting in a reactor scram and HPCI injection into the RPV.

One (1) minute after the scram, the following conditions are present:

- All rods at position 00
- RPV level is +56"
- RPV pressure is 820 psig
- HPCI and Reactor Feed Pumps have tripped
- Immediate operator actions have been performed

Which one of the following can the crew expect to occur over the next 10 minutes with NO additional operator action?

- A. RPV level will rise due to decay heat generation; RPV pressure will remain constant due to bypass valve operation.
- B. RPV level AND pressure will BOTH drop due to bypass valve operation.
- C. RPV level will rise and RPV pressure will drop due to continued CRD pump flow.
- D. RPV level AND pressure will BOTH rise due to decay heat generation.

K&A # 295008 AA2.04

Importance Rating 3.1

QUESTION 65

RO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
HIGH REACTOR WATER LEVEL : Heatup rate: Plant-Specific

Justification:

- A. Incorrect, bypass valves will not open until RPV pressure rises to approximately 934 psig. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- B. Incorrect, bypass valves will not open until RPV pressure rises to approximately 934 psig. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- C. Incorrect, the cold water injected by CRD will not be sufficient to overcome the decay heat immediately following the scram. Candidates may select this if they are unfamiliar with post scram RPV water level, pressure and temperature interaction, and the causes.
- D. **Correct, with no operator action, decay heat will cause both level and pressure to rise slowly**

K/A Match Justification:

This question matches the stated K/A since candidates must determine the effect of post scram decay heat on RPV level and pressure after level has been allowed to rise to level 8.

References: ON-100-101 rev 24

Reference Required none

Learning Objective: 15300

Question source: New

New

Question History: New

New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)5

Comments: Created by: T. North, 6/7/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 66

It is currently 10:30 AM on DAY shift:

You are the Unit 1 PCOM and are designated the "Operator At The Controls (OATC)".

It is determined that you require a SHORT TERM shift relief in order to attend a 30 minute meeting with Operations department management. You will be turning your OATC duties over to a licensed operator from the Work Control Center.

Which one of the following describes the PROCEDURALLY REQUIRED elements for this short term mid-shift relief?

- A. Verbal turnover, panel walkdown, review of current plant conditions AND complete turnover sheets.
- B. Verbal turnover, panel walkdown AND review of current plant conditions ONLY.
- C. Verbal turnover AND review of current plant conditions ONLY.
- D. Verbal turnover, panel walkdown AND complete turnover sheets ONLY.

K&A # 2.1.3
Importance Rating 3.7

QUESTION 66

RO Tier 3

K&A Statement:

Knowledge of shift or short-term relief turnover practices.

Justification:

- A. Incorrect, turnover sheets are not required. Candidates may select this if they incorrectly believe that turnover sheets are required in this situation.
- B. Correct, per OP-AD-002 7.4.8.b.1, all turnover elements are required except completion (the filling out of) of turnover sheets.**
- C. Incorrect, panel walkdown is also required. Candidates may select this if they do not correctly recall turnover required elements.
- D. Incorrect, review of current plant conditions is also required. Candidates may select this if they do not correctly recall turnover required elements.

K/A Match Justification:

This question matches the stated K/A since candidates must recall required elements of a proper short term mid-shift turnover per OP-AD-002.

References: OP-AD-002 rev 34 Reference Required none

Learning Objective: 4086

Question source: Modified INPO Bank #19050

Question History: Clinton 2000 NRC exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)10

Comments: Modified by: T. North, 10/26/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 67

In accordance with OP-000-002, "Valves", what alternate method of determining valve position may be utilized when inaccessibility prevents physical operation or observation of indication?

- A. Obtaining their positions as noted on the most current Status Control Log.
- B. Verifying system parameters (flow, pressure, etc) are as expected for the current plant conditions.
- C. Noting the inaccessible valves for verification on the next planned or unplanned entry.
- D. Referring to the most recently completed checkoff list on the system.

K&A # 2.1.29
Importance Rating 4.1

QUESTION 67

RO Tier 3

K&A Statement:

Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.

Justification:

- A. Incorrect, the valves are not necessarily under Status Control. Candidates may select this if they do not realize that not all valve positions are tracked under status control.
- B. Correct per OP-000-002, Valves, section 6.9**
- C. Incorrect, this does not provide current valve position indication. Candidates may select this if they do not understand that this will not provide the current valve position as required by procedure
- D. Incorrect, this is not procedurally directed and is not a "positive" method of determining valve position as required by procedure. Candidates may select this if assume that this is a "positive" method of position verification.

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall procedural requirements for the conduct of valve lineups.

References: OP-000-002 rev 8 Reference Required none

Learning Objective: 14829

Question source: SSES OPS_INITIAL_LICENSE
Bank # AD044/14829

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)10

Comments: Revised by: T. North 12/20/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 68

Which condition below constitutes a Technical Specification SAFETY LIMIT violation, AND what action must be taken?

- A. THERMAL POWER at 21% with reactor pressure at 650 psig;
Reduce core thermal power below the limit AND insert all control rods within 2 hours.
- B. Reactor steam dome pressure at 1,350 psig;
Reduce pressure below the limit within 2 hours ONLY.
- C. THERMAL POWER at 3995 MWth for 60 minutes.
Immediately reduce power to below the limit AND report the violation to the NRC within 30 days.
- D. THERMAL POWER at 24% with core flow at 6 Mlbm/hr.
Reduce core thermal power below the limit AND insert all control rods within 2 hours.

K&A # 2.2.22
Importance Rating 4.0

QUESTION 68

RO Tier 3

K&A Statement:

Knowledge of limiting conditions for operations and safety limits

Justification:

- A. Incorrect, TS SL has not been violated, thermal power must be $\leq 23\%$ when <785 # or < 10 MLB/hr. Violations of TS SLs require actions to be taken within 2 hours. Candidates may select this if they confuse 10 mlb/hr with 23% power as stated in TS, and cannot correctly recall the required actions.
- B. Incorrect, stated pressure is above the SL, however, compliance with TS SL AND insertion of control rods must be completed within 2 hours. Candidates may select this if they cannot correctly recall required actions,
- C. Incorrect, exceeding MWth license limit is not a safety limit. Candidates may select this if they confuse license power limits and TS SLs.
- D. **Correct, thermal power is $>23\%$ while flow is <10 MLB/hr which is a violation of SL 2.1.1.1. Per TS 2.2, compliance with the TS SL and insertion of all control rods must be completed within 2 hours.**

K/A Match Justification:

This question is a match to the stated K/A since candidates must recall safety limit required values and evaluate current plant parameters to determine compliance.

References: TS 2.0 rev 4 Reference Required none

Learning Objective: 13427, 13429

Question source: SSES OPS_INITIAL_LICENSE
Bank# TMOP401/0000 004

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)5

Comments: Modified by: T. North, 5/27/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 69

Using Standby Liquid Control System (SBLC) Piping and Instrumentation Diagram M-148, determine the effect of the following on SBLC system operation:

- Unit 1 is operating at full power when SBLC pressure control valve PCV-14811C (grid location B-2) fails SHUT.

Unit 1 SBLC system is...

- A. NOT capable of performing its intended safety function because the loss of air sparge will allow sediment to clog SBLC pump suction lines.
- B. capable of performing its intended safety function, but remote SBLC tank level indication will NOT be available.
- C. NOT capable of performing its intended safety function because operators will be unable to determine when Cold Shutdown Boron Weight has been injected.
- D. capable of performing its intended safety function, but the loss of air sparge will result in the inability to perform tank chemical additions.

K&A # 2.2.15
Importance Rating 3.9

QUESTION 69

RO Tier 3

K&A Statement:

Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc.

Justification:

- A. Incorrect, SBLC is still capable of injecting boron to the RPV, the sparge air is not lost, and is not used to prevent suction line clogging. Candidates may select this if they mis-read the print and incorrectly determine that sparge air is lost.
- B. **Correct, the failure of the PCV isolates air to the remote tank level indicators. These instruments will not affect the ability of SBLC to inject boron. Local ultrasonic level indication will be available.**
- C. Incorrect, this determination can be made since local level indication is still available. Further, this determination is not required for SLC to perform its safety function. Candidates may select this if they believe that ALL level indication is lost, and that this will impact the use of SLC during ATWS conditions.
- D. Incorrect, the sparging air is not affected by the PCV failure. Candidates may select this if they mis-read the print and incorrectly determine that sparge air is lost

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate and determine SBLC system status and configuration using a controlled station print.

References:	M-148 rev 39, TM-OP-053 rev 9	Reference Required	Unit 1 SBLC one-line diagram M-148
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Learning Objective: 1217.h

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 12/22/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 70

Reactor power is 80% and being returned to 100% power following special testing and a control rod sequence exchange. The following alarms are received in the control room.

- AR-015-D04, "STACK MONITORING SYS 0C630/0C677 HI-HI RADIATION"
- AR-015-E04, "STACK MONITORING SYS 0C630/0C677 HI RADIATION"

Further investigation reveals that Turbine Building Exhaust Radiation (Point #5) is the cause of the alarm and

Offgas subtrain flow is 75% of the value it was before the power increase began. Offgas recombiner flow has increased as power has increased.

Given ON-070-001, "Abnormal Gaseous Radiation Release/CAM Alarms", what actions are required for this situation?

- A. Isolate the Primary Coolant Degasifier.
- B. Start the Common Offgas Recombiner and shutdown the Unit 1 Offgas recombiner.
- C. Shutdown Radwaste Ventilation.
- D. Verify proper operation of OFFGAS DELAY LINE DRAIN VLVS.

K&A # 2.3.11
Importance Rating 3.8

QUESTION 70

RO Tier 3

K&A Statement:

Ability to control radiation releases.

Justification:

- A. incorrect - this action would be appropriate ONLY after chemistry sampled the degasifiers and determined that they are the source of the high radiation..
- B. incorrect - with the drop in offgas flow, a candidate may believe the source of the problem to be with the recombiners, in which case shutting down the ineffective recombiner and starting the common recombiner would be appropriate
- C. incorrect - appropriate if Radwaste is believed to be the source, but this is not consistent with the indications given the drop in offgas flow.
- D. **Correct, Per ON-070-001 step 3.2 failure of these valves is the probable cause given the drop in offgas flow, therefore operators should take steps to ensure that they have properly isolated.**

K/A Match Justification:

This question matches the stated K/A since candidates determine the correct method to control the radiation release based on plant conditions and the procedure provided

References: ON-070-001 rev 16

Reference Required

~~none~~ *YK*

Learning Objective: 15308

ON-070-001

Question source: SSES NRC Bank #364

Question History: SSES 2003 Cert exam

Cognitive level:

Memory/Fundamental knowledge:

Comprehension/Analysis: X

10CFR55

41(b)11

Comments:

Created/Modified by: Bank

Reviewed by: M. Jacopetti 01/06/11

QUESTION 71

Unit 1 is in MODE 5 with the drywell open for maintenance.

In order to operate the TIP system in accordance with OP-178-001, "TIP System", under these conditions the Health Physics department must restrict access to the:

TIP room AND ...

- A. Drywell AND CIG mezzanine ONLY.
- B. Drywell AND north HCU area ONLY.
- C. CIG mezzanine ONLY.
- D. CIG mezzanine, AND north HCU area ONLY.

K&A # 2.3.12
Importance Rating 3.2

QUESTION 71

RO Tier 3

K&A Statement:

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.

Justification:

A. Correct per OP-178-001

B. Incorrect, north HCU area access is not restricted. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

C. Incorrect, drywell access is also restricted. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

D. Incorrect, north HCU area access is not restricted, and DW access is controlled. Candidates may select this if they are unfamiliar with areas affected by elevated rad levels in the TIP room.

K/A Match Justification:

This question matches the stated K/A since candidates must recall radiological principles associated with high radiation levels in the TIP room (locked high rad area).

References: OP-178-001 rev 19

Reference Required

none

Learning Objective: 10152

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)12

Comments: Modified by: T. North, 6/22/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 72

Unit 1 was operating at full power when Reactor Recirc Pump A tripped.

Which one of the following indicates the presence of Thermal Hydraulic Instability (THI) in accordance with ON-178-002, "Core Flux Oscillations"?

- A. "OPRM TRIP ENABLED", ARM-103-001 (C05) annunciator illuminates.
- B. APRM peak to peak oscillations are approximately 7% and rising.
- C. LPRM upscale alarms annunciate, then clear 10 seconds later.
- D. Reactor Pressure and Main Generator load oscillations occur.

K&A # 2.4.21
Importance Rating 4.0

QUESTION 72

RO Tier 3

K&A Statement:

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.

Justification:

- A. incorrect – Only the OPRM TRIP and OPRM ALARM annunciators are indicative of the presence of THI. This annunciator merely indicates that power/flow conditions exist that enable the OPRM channels to generate a trip if oscillations occur. Candidates may select this if they confuse the meaning of this annunciator with those of the TRIP or ALARM.
- B. **Correct per ON step 3.3.3.a: “Peak to peak oscillations trending towards 10% on APRMs (Oscillations measured from minimum peak to maximum peak)”**
- C. incorrect - LPRM indications for oscillations have a 1-5 second period. Candidates may select this if they do not correctly recall that LPRM alarm frequency of 1-5 seconds is required.
- D. incorrect – while these symptoms may require operators to evaluate the possibility of THI, they are not definitive indications as outlined by the ON. Further, THI can cause local flux oscillations that are NOT reflected in average APRM power, total MWth resulting in NO significant perturbation in RPV pressure or generator load. Candidates may select this if they do not correctly recall specific parameters and logic needed to assess the status of THI per the ON.

K/A Match Justification:

This question matches the stated K/A since candidates must recall the parameters and logic used to assess the presence of thermal hydraulic instabilities and the potential for fuel damage.

References: ON-178-002 rev 16 Reference Required none

Learning Objective: 15308

Question source: INPO Bank #23870

Question History: SSES 2002 NRC Exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 41(b)7

Comments: Created/Modified by: T. North, 12-18-10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 73

With the unit in MODE 1, which one of the following conditions will require entry into EO-100-102, "RPV Control", EO-100-103, "PC Control", AND EO-100-113, "Level/Power Control".

(consider only current values of the stated parameters)

- A. A small LOCA causes drywell pressure to rise to 1.80 psig, one control rod sticks at position 48, all other rods fully insert.
- B. HPCI operation causes suppression pool water temperature to rise to 108°F, and a manual scram results in NO rod motion.
- C. A Main Turbine trip occurs, reactor power remains at 35%, and a loss of drywell cooling causes drywell temperature to rise to 145°F.
- D. A loss of feed causes RPV water level to drop to +1", 10 control rods stick at position 48, and RCIC operation causes suppression pool level to rise to 23.5 ft.

K&A # 2.4.4
Importance Rating 4.5

QUESTION 73

RO Tier 3

K&A Statement:

Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.

Justification:

- A. Incorrect, conditions requiring L/P control entry are not met with only one rod not full in. Candidates may select this if they do not correctly recall the entry conditions for L/P control EOP.
- B. Correct, SP temp >90F, and ATWS will require entry into all 3 of the stated EOPs**
- C. Incorrect, drywell temp is not high enough for PC control entry. Candidates may select this if they do not correctly recall the entry conditions for PC control EOP.
- D. Incorrect, SP level is not high enough for PC Control entry. Candidates may select this if they do not correctly recall the entry conditions for PC control EOP.

KA Match Justification:

This question matches the stated K/A since candidates must correctly recognize abnormal parameter indications that will require EOP entry.

References: EO-000-102 rev 8, -103 rev 7, -113 rev 8 Reference Required none

Learning Objective: 14585

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)10

Comments: Created by: T. North, 6/22/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 74

Which one of the following will result in a violation of the Unit 1 facility operating license, NPF-14?

- A. Continued operation above 94.4% Core Thermal Power.
- B. Operation at power with NO reactor recirc pumps in operation.
- C. Briefly exceeding 100.1% of 3952 MWth on NBA01, "CTP Instantaneous".
- D. Operation at power within region 1 of TRM 3.2.1 "Power/Flow Map".

QUESTION 75

Unit 1 was operating at 100% power when a small steam leak occurs inside the Reactor Building steam tunnel.

- Main Steam tunnel temperature is 180°F, up slow
- Main Steam Isolation Valves (MSIV) are OPEN
- All other Reactor Building temperatures are normal

Which EOP(s) must be entered AND which one of the actions is required as a DIRECT result of the trend in steam tunnel temperature?

- A.
 - Enter EO-100-104, "Secondary Containment Control" AND EO-100-102, "RPV Control"
 - Verify that the MSIVs shut when temperatures exceeds 197°F
- B.
 - Enter EO-100-102, "RPV Control" ONLY
 - Shut the MSIVs
- C.
 - Enter EO-100-104, "Secondary Containment Control" AND EO-100-102, "RPV Control"
 - Shut the MSIVs
- D.
 - Enter EO-100-104, "Secondary Containment Control" ONLY
 - Verify that the MSIVs shut after 15 minutes.

K&A # 2.4.2
Importance Rating 4.5

QUESTION 75

RO Tier 3

K&A Statement:

Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions.

Justification:

- A. Incorrect, the MSIVs should have isolated at 177°F in the RB steam tunnel. Candidates may select this if they incorrectly recall the isolation setpoint as 197°F, which is the setpoint for the Turbine Building Main Steam Pipe Tunnel.
- B. Incorrect, entry conditions for SC Control EOP have been met. Candidates may select this if they do not recall the Max Normal temperature for the RB MSL Pipe Tunnel, which is 157°F, which is an EO-100-104 entry.
- C. **Correct, MSL tunnel temperature >157°F is an entry condition to SC Control EOP. Since the MSIVs have failed to close, the crew should immediately complete the isolation manually. EO-100-102 must also be entered due the scram.**
- D. Incorrect, entry conditions for EO-100-102 exist post-scram. Candidates may select this if they incorrectly determine that the MSIV Pipe Tunnel Temperature isolation has a 15 minute time delay like HPCI and RCIC pipe routing.

K/A Match Justification:

This question matches the stated K/A since candidates must recall knowledge of MSIV isolation setpoints that are associated with Secondary Containment control EOP entry.

References: RM-OP-059B rev 5, EO-000-104 rev 6, Reference Required none
ON-159-002 rev 29

Learning Objective: 14583.c

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 41(b)7

Comments: Created by: T. North, 01/06/11
Reviewed by: M Jacopetti 01/06/11

QUESTION 76

SRO ONLY

Unit 1 is operating at full power with a Total Core flow of 102 Mlbm/hr, when the 1A Reactor Recirc Pump (RRP) trips.

The following conditions are now present:

- OPRMs are inoperable
- APRM power is 62 %, and steady
- Total core flow is 50 mlbm/hr, and steady
- The cause of the 1A RRP trip has been corrected

Which one of the following actions is REQUIRED?

- A. Insert control rods in accordance with the CRC Book.
- B. Raise total core flow using 1B Recirc Pump.
- C. Restart 1A RRP and raise core flow.
- D. Place the mode switch to shutdown.

K&A # 295001 AA2.01
Importance Rating 3.7

QUESTION 76

SRO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to
**PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW
CIRCULATION : Power/Flow Map**

Justification:

- A. **Correct, since the P/F plot results in operation in region 2, and flow cannot be raised, the ON directs that R2 be exited by inserting control rods in accordance with the CRC book.**
- B. Incorrect, B recirc flow cannot be raised since it is already at 80% as plotted on the P/F map. Candidates may select this if they incorrectly believe that B pump flow can be raised.
- C. Incorrect, per OP-164-001, restart of the A pump is not allowed when above the 60% rod line, and this action will not permit RAPID exit of R2 as directed by ON-178-002. Candidates may select this if they believe that restart of the A pump is allowed.
- D. Incorrect, this action is required with OPRMs inop and operating in region 1. Candidates may select this if they incorrectly determine that they are operating in R1.

K/A Match and SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate the status of recirc flow and reactor power with respect to the power to flow map, and determine the correct action required.

References:	ON-164-002 rev 33; ON-178-002 rev 16; TS 3.4.1 rev 3; OP-164-001 rev 57 TRM 3.2 Figure 9-1	Reference Required	TRM 3.2 Figure 9.1, Power/Flow Map, with regions and actions redacted
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Learning Objective: 14908

Question source: SSES Requal Bank #AD044/14908

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Modified by: Bank
Reviewed by: M Jacopetti 01/06/11

QUESTION 77
SRO ONLY

Unit 1 has experienced an accident with a small High Pressure Coolant Injection System steam leak discharging into Secondary Containment (SC) and significant fuel failure. Current conditions are:

- HPCI is injecting at rated flow and maintaining RPV water level at -145", steady.
- No other high pressure injection sources are available.
- RPV pressure is 940 psig, down slow.
- Field reports indicate that steam is exiting the Unit 1 Reactor Building from the HPCI room blowout panel steam vent stack.

The crew should (1) because (2) .

- A. (1) isolate the HPCI steam line
 (2) it is the most direct and effective method for terminating the radioactivity release.
- B. (1) isolate the HPCI steam line
 (2) terminating the offsite release is a higher priority than actions required to maintain adequate core cooling.
- C. (1) leave HPCI in service to maintain RPV water level
 (2) this may prevent further fuel damage and a significantly higher release rate.
- D. (1) leave HPCI in service to maintain RPV water level
 (2) EOP required actions have a higher priority than those required for the emergency plan.

K&A # 295038 2.4.18

Importance Rating 4.0

QUESTION 77

SRO Tier 1 Group 1

K&A Statement:

High Offsite Release Rate:

Emergency Procedures / Plan: Knowledge of the specific bases for EOPs.

Justification:

- A. Incorrect, systems needed for EOP/DSP actions should not be isolated. Also, this action may not be the most effective method for terminating the release, given that actions to stop the release from the blowout panel steam vent stack can also be attempted. Candidates may select this if they do not correctly recall the required action and its basis.
- B. Incorrect, see A above.
- C. **Correct, EO-100-105, Rad Release, step RR-2 requires that systems needed for important EOP or DSP actions remain in service because isolation of those systems and not taking the required actions may result in a much larger release. Leaving HPCI in service may prevent further fuel damage by maintaining adequate core cooling, limiting further increase in the offsite release rate. In addition, and EO-100-104 Secondary Containment Control, step SC/T-4 also provides the same guidance because RPV Control, PC Control, and EOP contingencies have a higher priority than EO-104.**
- D. Incorrect, EOP actions do not necessarily have priority over EP actions. Candidates may select this if they do not correctly recall the basis for these EOP steps.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate plant conditions, determine the correct EOP action required, and recall the basis for that action.

References: EO-000-105 rev 3 Reference Required none

Learning Objective: 14594

Question source: Modified INPO bank #25837

Question History: SSES 2003 NRC exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: *modified to raise to SRO level, and better match the selected K/A.* Created by: T. North, 12/17/10
Reviewed by: M Jacopetti 01/06/11

QUESTION 78
SRO ONLY

Both Units are operating at full power when a fire is detected in the Unit 2 turbine building. The fire brigade is activated.

Several minutes later the following conditions occur:

- Simplex alarm FIRE DET 106_Z4 ALM, "Control Structure Outside Air Intake" actuates
- A SLIGHT smell of smoke is detected in the control room
- The fire brigade reports that the fire is still in progress, but under control

Which one of the following is REQUIRED?

- A. Direct actions to shutdown the Control Structure HVAC system per OP-030-001, "Control Structure HVAC"
- B. Direct actions to place the Smoke Removal System in service to ensure long term control room habitability per OP-030-001, "Control Structure HVAC".
- C. Direct actions to place the CREOASS system in PRESSURIZATION/FILTRATION MODE to isolate control room ventilation system from the source of smoke per ON-013-001, "Response to Fire".
- D. Direct actions to place the CREOASS system in RECIRCULATION MODE to prevent further smoke intrusion to the control room per ON-013-001, "Response to Fire".

K&A # 600000 AA2.03
Importance Rating 3.2

QUESTION 78

SRO Tier 1 Group 1

K&A Statement:

Ability to determine and interpret the following as they apply to
PLANT FIRE ON SITE: Fire alarm

Justification:

- A. Incorrect, ON-013-001, directs ensuring Control Structure HVAC is in service in the event of a fire. Candidates may select this if they believe that it is appropriate to shutdown the HVAC system to prevent smoke from entering the control room.
- B. Incorrect, per ON-013-001 and OP-030-001, the smoke removal system should not be placed in service until the fire is no longer in progress. Candidates may select this if they incorrectly believe the smoke removal system should be placed in service in this instance and do not correctly recall the mitigating strategies contained in ON-013-001
- C. Incorrect, the pressurization mode of CREOASS, outside air intake to the control room is shifted to the CREOASS trains, and will not prevent smoke intrusion. Candidates may select this if they do not correctly understand CREOASS system lineups or the mitigating strategies contained in ON-013-001.
- D. **Correct, ON-013-001 directs that CREOASS be placed in recirculation mode if smoke is detected in the MCR.**

K/A Match Justification:

This question matches the stated K/A since candidates must interpret plant conditions following receipt of a fire alarm resulting from a fire on site.

SRO Only Justification:

This question is SRO only since candidates must correctly select and apply the required procedure and mitigating strategy based on plant conditions.

References: ON-013-001 rev 28, TM-OP-030 rev 4, Reference Required none
ON-100(200)-009 rev 21, OP-030-002
rev 26. FPP-013-155 rev 7

Learning Objective: 15306

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 43(b)5

Comments: Created by: T. North, 12/17/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 79
SRO ONLY

Unit 1 was at full power when a reactor scram occurred.

The following conditions are currently present:

- RPV water level is being controlled at +20" with one reactor feed pump
- RPV pressure is being controlled with bypass valves in automatic
- 60 control rods are NOT fully inserted
- All other control rods are at position 00
- Reactor power is midscale on IRM range 7, down slow
- ALL APRM channels are downscale
- Reactor period is -10 seconds, and stable
- NO boron has been injected

Which one of the following RPV pressure control strategies is CORRECT?

- A. Commence a reactor cooldown < 100°F/hour UNLESS re-criticality is observed OR the shutdown cooling interlock clears.
- B. Stabilize RPV pressure < 1087 psig UNTIL ALL control rods are fully inserted, then commence a cooldown < 100°F/hour.
- C. Stabilize RPV pressure < 1087 psig UNTIL ALL BUT 1 of the stuck rods is fully inserted, then commence a cooldown < 100°F/hour.
- D. Commence a reactor cooldown < 100°F/hour with NO restrictions UNTIL the shutdown cooling interlock clears.

K&A # 295006 2.1.7
Importance Rating 4.7

QUESTION 79

SRO Tier 1 Group 1

K&A Statement:

Scram:

Conduct of Operations: Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

Justification:

- A. **Correct, per EO-000-113, (LQ/P-8) Level/Power Control, if the reactor is subcritical on control rods and no boron has been injected, cooldown may commence <100F/hr, unless re-criticality is observed.**
- B. Incorrect, cooldown may commence regardless of the status of the stuck rods as long as the reactor is subcritical and no boron has been injected. Candidates may select this if they incorrectly believe that cooldown cannot commence until the reactor meets the shutdown criteria for exiting the ATWS EOP, and do not correctly recall that criteria.
- C. Incorrect, cooldown may commence regardless of the status of the stuck rods as long as the reactor is subcritical and no boron has been injected. Candidates may select this if they incorrectly believe that cooldown cannot commence until the reactor meets the shutdown criteria for exiting the ATWS EOP.
- D. Incorrect, cooldown may commence, however, cooldown is restricted by the ability to maintain the reactor subcritical while cooldown is in progress. Cooldown must be stopped if re-criticality is observed. Candidates may select this if they do not correctly recall cooldown restrictions when the reactor does not meet the strict "shutdown under all conditions" definition.

K/A Match Justification:

This question matches the stated K/A since candidates must evaluate IRM and SRM reactor power and period indications and determine that a reactor cooldown may commence in accordance with the EOP provided.

SRO Only Justification:

This question is SRO only since candidates must evaluate plant conditions and select the correct emergency procedural strategy based on that evaluation as required by 10 CFR 43(b)(5)

References: EO-000-113-1 rev 9 Reference Required None

Learning Objective: 14622

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created by: T. North, 12/16/10
Reviewed by: M Jacopetti 01/06/11

QUESTION 80
SRO ONLY

Unit 1 has experienced a failure of the Electrohydraulic Control (EHC) system causing an uncontrolled RPV pressure rise.

The Reactor Protection System AND Alternate Rod Insertion systems failed to shutdown the reactor resulting in the following INITIAL transient conditions:

- RPV Pressure peaked at 1150 psig
- INITIAL ATWS power was 10%

SEVERAL MOMENTS LATER the following conditions are present:

- Reactor power is CURRENTLY 2%, down slow due to boron injection
- Control rods have NOT yet been inserted
- RPV pressure is 1090 psig, being controlled with SRVs
- Suppression Pool temperature is 190°F, up slow
- Suppression Pool Level is 22 ft., up slow

Given the Suppression Pool Temperature (SP/T) leg and figure 2, Heat Capacity Temperature Limit, from EO-100-103, "PC Control", determine which one of the following is the CORRECT action:

The Unit Supervisor must (1) because (2) .

- A. (1) WAIT until the reactor is shutdown with control rods AND RPV pressure exceeds 1106 psig prior to directing Rapid Depressurization
(2) large amplitude power swings may occur at low pressure and high power
- B. (1) WAIT until RPV pressure exceeds 1106 psig ONLY prior to directing Rapid Depressurization
(2) the suppression pool can still absorb all the energy from the RPV without exceeding primary containment pressure limits.
- C. (1) WAIT until the reactor is shutdown with control rods prior to directing Rapid Depressurization
(2) large amplitude power swings may occur at low pressure and high power
- D. (1) DIRECT Rapid Depressurization NOW based on current plant conditions
(2) the suppression pool may not absorb all the energy from the RPV without exceeding primary containment pressure limits.

K&A # 295025 2.2.44

Importance Rating 4.4

QUESTION 80

SRO Tier 1 Group 1

K&A Statement:

High Reactor Pressure:

Equipment Control: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions.

Justification:

- A. Incorrect, RD will only need to be postponed due to initial ATWS power. The current combination of RPV pressure, SP level and SP temp should be plotted on the unsafe side of the HCTL curve. RPV pressure rise above 1106 will not change this status. Candidates may select this if they improperly interpret the HCTL curve.
- B. Incorrect, since initial ATWS power was >5% RD must be postponed regardless of HCTL status due to potential power excursions at low RPV pressure. Current values of RPV pressure, SP level and temp should be plotted on the unsafe side of the HCTL curve, therefore, the SP currently MAY NOT be able to absorb RPV energy without exceeding 65 psig. Candidates may select this if they incorrectly evaluate the HCTL curve, and fail to recognize that RD must be postponed due to initial ATWS power.
- C. **Correct, per EO-000-103, SP/T-5, if initial ATWS power is >5% further actions in the SP/T leg may be postponed. Although the plot of RPV pressure, SP temp and level results in operation on the unsafe side of the HCTL curve, RD be must be postponed until the Rx is S/D with control rods to preclude large power oscillations at low RPV pressure.**
- D. Incorrect, although operation is currently on the unsafe side of the HCTL curve and SP pool safety function is in jeopardy, RD cannot be performed at this time due to initial ATWS power >5%. Candidates may select this if they fail to recognize that RD is precluded by initial ATWS power.

K/A Match/SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate and interpret plant indications and use these to evaluate the status of the suppression pool. They must further determine the correct EOP action to be directed and understand the impact this action will have on plant operation.

References:	EO-000-103 rev 7; EO-100-103 rev 9.	Reference Required	EO-100-103, SP/T leg and HCTL curve with SPOTMOS note removed, only.
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Learning Objective: 14594

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE bank
#PP002/2680 002

Question History: MODIFIED BANK

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created by: T. North, 9/9/10
Reviewed by: M Jacopetti 01/06/11

QUESTION 81
SRO ONLY

Unit 1 was operating at full power when an automatic scram occurred.

- Multiple control rods failed to fully insert
- Reactor power immediately following the scram was 13%
- SLC pump A is injecting
- Reactor power is now 2%, down slow
- RPV water level is +18", steady with Reactor Feed Pumps injecting

Which one of the following actions must the crew take?

- A. Continue to maintain water level at its current value, and establish a water level band of +13" to +54".
- B. Continue to maintain water level at its current value, and establish a water level band of -129" to +54".
- C. Throttle and prevent injection to the RPV until water level is below -110", then establish a water level band of -110" to -161".
- D. Throttle and prevent injection to the RPV until water level is below -60", then establish a water level band of -60" to -110".

K&A # 295037 EA2.02
Importance Rating 4.1

QUESTION 81

SRO Tier 1 Group 1

K&A Statement:

Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN : Reactor Water Level

Justification:

- A. Incorrect, with ATWS conditions present and initial ATWS power above 5%, RPV water level must be lowered. Candidates may select this if they assume that since current power is below 5%, they may establish the normal water level band of +13-54".
- B. Incorrect, with ATWS conditions present and initial ATWS power above 5%, RPV water level must be lowered. Candidates may select this if they assume that since current power is below 5%, they may establish the level band of -129" to +54". This level band is only directed under ATWS conditions when initial ATWS power is below 5%.
- C. Incorrect, the correct level band directed by EO-100-112, Level Power Control, with initial ATSW power above 5% is -60" to -161" and is established after intentionally throttling and preventing injection. Candidates may select this if they do not correctly recall that the target level band in these conditions is above -110".
- D. **Correct, when initial ATWS power is >5% RPV level must initially be lowered to below -60" even if current power is below 5%. Then the target level band as directed by EO-100-113 is -60" to -110".**

K/A Match Justification:

This question matches the stated K/A since candidates must correctly determine that current RPV water level is above the required value for current conditions and must select the correct strategy and target level control band.

References: EO-100-113, rev 10; EO-000-113, rev 9 Reference Required none

Learning Objective: 14622

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

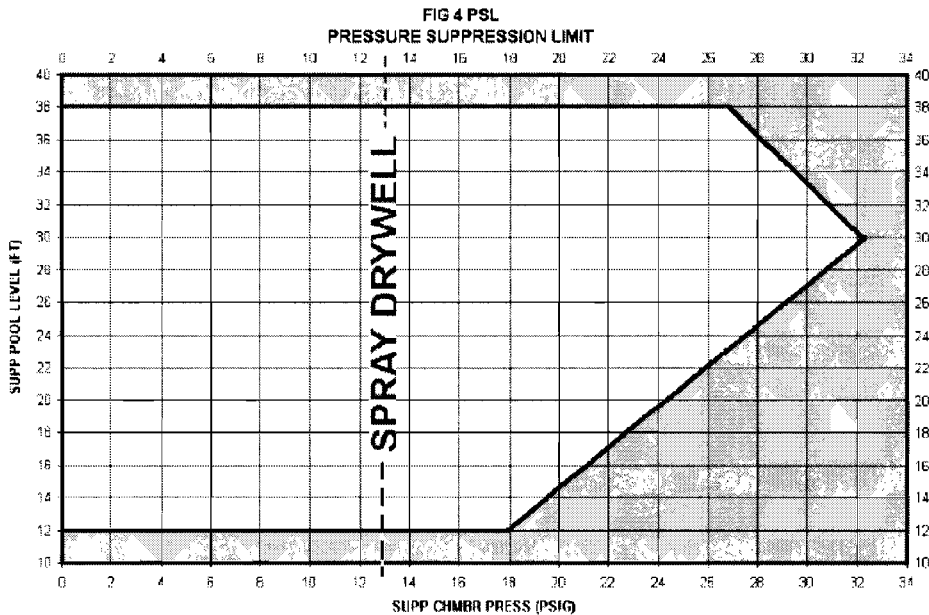
Comments: Created by: T. North, 12-17-10
Reviewed by: M Jacopetti 01/06/11

QUESTION 82
SRO ONLY

Unit 1 has experienced a seismic event resulting in a LOCA and an UN-ISOLABLE leak of the suppression pool into Secondary Containment:

- RPV Pressure is 850 psig, down 10 psig/min.
- Drywell pressure is 18.5 psig, up 0.5 psig/min.
- Drywell AND Suppression Chamber sprays are UNAVAILABLE
- Suppression Chamber pressure is 20 psig, up 1.0 psig/min.
- Suppression Pool water level is 18 feet, down 2"/min.

Given figure 4 PSL below, determine which one of the following actions is required:



- Fully open ALL turbine bypass valves UNTIL suppression pool level drops to 14.5 ft, then perform EO-100-112, "Rapid Depressurization".
- Perform EO-100-112, "Rapid Depressurization" NOW because the Pressure Suppression Limit WILL BE exceeded.
- Cooldown the RPV $\leq 100^{\circ}\text{F/hr}$ UNTIL suppression pool level drops to 12 ft, then perform EO-100-112, "Rapid Depressurization".
- Fully open ALL turbine bypass valves UNTIL suppression chamber pressure reaches 22 psig, then perform EO-100-112, "Rapid Depressurization".

K&A # 295030 2.4.6

Importance Rating 4.7

QUESTION 82

SRO Tier 1 Group 1

K&A Statement:

Low Suppression Pool Water Level:

Emergency Procedures/Plan: Knowledge of EOP mitigation strategies.

Justification:

- A. Incorrect, PSL curve status requires RD since parameters cannot be maintained in the safe region of the curve. Candidates may select this if they believe they have adequate time to open all bypass valves before exceeding the PSL Curve. In addition, at the rate of change / trends given waiting until Sup Pool level is at 14.5' would result in exceeding the curve.
- B. **Correct, the rapidly lowering SP level and rising SC pressure will result in operation in the unsafe region of the PSL curve within several minutes, therefore parameters cannot be maintained in the safe region. This requires RD now.**
- C. Incorrect, PC parameters cannot be maintained on the safe side of figure 4, therefore RD is required now. Candidates may select this if they believe they must wait until they reach the unsafe region due to SP level reaching 12'.
- D. Incorrect, PC parameters cannot be maintained on the safe side of figure 4, therefore RD is required now. Candidates may select this if they believe they must wait until they reach the unsafe region due to SC pressure.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate plant conditions and correctly determine the required EOP mitigating strategy.

References: EO-000-103 rev 7; EO-100-103 rev 9, Reference Required none
PP002, rev 10

Learning Objective: 14622, 14624

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)2

Comments: Created by: T. North, 11/16/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 83
SRO ONLY

Unit 1 is operating at 100% power with Control Rod Drive (CRD) Pump “B” out of service for corrective maintenance.

Unit 2 is in mode 4 with the CRD Hydraulic system out of service for a major modification.

Unit 1 CRD Pump “A” then trips due to a lockout and cannot be restarted. Electrical maintenance reports that the pump motor has failed.

The following is a timeline of events:

Time (minutes)	Event
T_0	Unit 1 CRD pump “A” trips
$T_0 + 10$	FIRST accumulator trouble alarm
$T_0 + 13$	NPO reports HCU 22-23 pressure is 935 psig, down slow. Rod 22-23 is at position 24 and is declared INOPERABLE
$T_0 + 15$	SECOND accumulator trouble alarm
$T_0 + 18$	NPO reports HCU 42-15 pressure is 940 psig, down slow. Rod 42-15 is at position 48 and is declared INOPERABLE

Which one of the following is the REQUIRED action?

- A. Enter GO-100-004, “Plant Shutdown to Minimum Power” and COMMENCE A REACTOR SHUTDOWN IMMEDIATELY.
- B. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN IMMEDIATELY.
- C. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN PRIOR TO time $T_0 + 35$
- D. Enter ON-100-001, “Scram, Scram Imminent” and place the reactor MODE SWITCH TO SHUTDOWN PRIOR TO time $T_0 + 38$

K&A # 295022 AA2.02
Importance Rating 3.4

QUESTION 83

SRO Tier 1 Group 2

K&A Statement:

Ability to determine and/or interpret the following as they apply to
LOSS OF CRD PUMPS : CRD system status

Justification:

- A. Incorrect, the normal shutdown procedure will not meet the procedural requirement to place the Rx mode switch to S/D within 20 minutes. Candidates may select this if they choose the incorrect procedure to comply with the 20 minute requirement.
- B. Incorrect, The immediate scram requirement is not applicable unless RPV pressure is <900#. RPV pressure at 100% power is normally >1000#. Candidates may select this if they incorrectly apply the immediate scram requirement with RPV pressure >900#
- C. Incorrect, the scram REQUIREMENT will not expire until T+38. Candidates may select this if they incorrectly apply the 20 minute requirement to the receipt of the 2nd HCU low pressure alarm at T+15. This alarm comes in at 975, so the accumulator should not be declared inop until confirmed <940 psig.
- D. **Correct, ON-155-007, Loss of All CRD Flow, requires that the mode switch be placed in shutdown within 20 minutes following the DISCOVERY of the 2nd inop control rod due to low accumulator pressure. HCU 42-15 was discovered to be <940 psig at T+18, therefore the scram is REQUIRED prior to T+38. Cross connect to Unit 2 CRD system is unavailable due to U2 status.**

K/A Match Justification:

This question matches the stated K/A since candidates must interpret the status of HCU operability following a loss of both CRD pumps.

SRO Only Justification:

This question is SRO only since SRO candidates must evaluate system status and determine the required, procedurally directed mitigating strategy following the declaration of multiple inoperable control rods.

References: ON-155-007 rev 21; TM-OP-055, rev 5 Reference Required none

Learning Objective: 10034.c

Question source: SSES OP002 Requal Bank
#AD045/15304 008

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti 01/06/11

QUESTION 84
SRO ONLY

Unit 1 is operating at full power when a central control rod drifts from position 24 to position 48.

The STA reports that the 60 minute average Core Thermal Power is 3954 MWth.

The Unit Supervisor (US) enters and directs actions in accordance with ON-155-001, "Control Rod Problems" due to the drifting control rod.

Which ADDITIONAL procedure(s) must the US enter, AND what action must be taken?

- A.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit" AND ON-156-001, "Unanticipated Reactivity Change"
 - Attempt to select and insert the drifting control rod then reduce power with recirc flow if the rod will not remain at "00".

- B.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit", AND ON-156-001, "Unanticipated Reactivity Change"
 - Individually scram the drifting control rod then disarm the HCU.

- C.
 - ON-156-001, "Unanticipated Reactivity Change" ONLY
 - Declare the drifting control rod inoperable, insert it to "00", then disarm the HCU.

- D.
 - ON-100-004 "Reactor Power Greater Than Authorized Limit" ONLY
 - Attempt to select and insert the drifting control rod then reduce power with recirc flow if the rod will not remain at "00".

QUESTION 85
SRO ONLY

Unit 1 has experienced a PRIMARY system leak into SECONDARY Containment.

EO-100-102, "RPV Control", and EO-100-104, "Secondary Containment Control" have been entered.

Reactor Building 749' Fire Suppression System Simplex Fire Alarm X218_Z7 is ALARMING.

Which one of the following is the operational impact of this alarm; AND what action should the crew take?

- A.
 - Reactor building temperatures are rising toward max safe values.
 - Take actions to anticipate rapid depressurization.

- B.
 - Reactor building 749' level may be inaccessible due to a potential fire.
 - Immediately activate the Fire Brigade.

- C.
 - Reactor building 749' level may become flooded due to fire system initiation.
 - Evaluate further EOP actions for Secondary Containment flooding

- D.
 - Reactor building 749' level may be above 212°F
 - Limit the use of the RPV Wide Range Level indicator to ABOVE -125".

QUESTION 86
SRO ONLY

With Unit 1 at full power, Recirc Flow Transmitter FT-B31-1N014A fails
DOWNSCALE.

Which one of the following describes the expected response of the Power Range Neutron Monitoring System (PRNMS); AND what procedure should the Unit Supervisor implement?

- A.
 - Half-scam from the two out of four voters in Division I for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - GO-100-012, "Power Maneuvers", to reduce power and clear the Half scam, Rod Block, and APRM Flow Reference Off-Normal Alarm.

- B.
 - Half-scam from the two out of four voters in Division I for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - AR-103-001-E06 to bypass APRM 1 and clear the Rod Block and Half-scam.

- C.
 - Single Vote on all two out of four voters for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - AR-103-001-E06 to bypass APRM 1 and clear the Rod Block and APRM vote.

- D.
 - Single Vote on all two out of four voters for APRM 1; Rod Block; "APRM Flow Reference Off-Normal" Alarm AR-103-E06;
 - GO-100-012, "Power Maneuvers", to reduce power and clear the Rod Block, APRM vote, and APRM Flow Reference Off-Normal Alarm.

K&A # 215005 A2.05
Importance Rating 3.6

QUESTION 86

SRO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions Loss of recirculation flow signal

Justification:

- A. Incorrect, No half scram will occur. Power reduction is not necessary, since actual power has not changed. Candidates may select this if they believe conditions will generate a half scram and that a power reduction is necessary to clear the condition.
- B. Incorrect, no half scram will occur. Candidates may select this if they believe conditions will generate a half scram.
- C. **Correct, with flow sensed by APRM 1 now significantly reduced, power will be above the rod block and flow biased trip setpoints. This generates a single APRM vote and a rod block. The APRM off normal flow alarm will actuate due to a >7% flow comparator signal.
The alarm response procedure provides direction for bypassing APRM 1. This will clear the input to RPS and RMCS.
Whit a failed flow transmitter, the off normal flow alarm will remain lit.**
- D. Incorrect, no power reduction is necessary. Candidates may select this if they believe a power reduction is necessary to clear the condition.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must predict the plant impact of a failure of the recirc flow transmitter, and select the correct procedural strategy to correct the condition.

References: TM-OP-078D rev 6, AR-103-001 E06 Reference Required none
rev 38

Learning Objective: 15716

Question source: Modified SSES OP002 Requal
Bank #TMOP078D/15716 003

Question History: Modified Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Modified by: T. North, 7/19/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 87
SRO ONLY

Unit 2 was operating at full power, when an ATWS occurred requiring boron injection.

10 minutes ago, SBLC was initiated from the control room.

The following conditions are NOW present:

- Reactor power : 45%, down slow
- Reactor Pressure: 1045 psig, steady
- RPV level: -8", down slow
- Suppression Pool Temperature: 106°F, up slow
- SBLC pump 'A' discharge pressure: 1500 psig, steady
- SBLC pump 'B': Tagged out, unavailable
- SBLC tank level: 2000 gallons

Which one of the following is the current status of SBLC AND what action should the crew take?

	<u>SBLC Status</u>	<u>Required Action</u>
A.	NOT injecting	Manually gag shut the SBLC relief valve
B.	NOT injecting	Lineup RCIC for Boron injection
C.	Injecting	Secure injection when tank level reaches 0 gallons
D.	Injecting	Continue to inject until CSBW has been injected

K&A # 211000 A2.04
Importance Rating 3.4

QUESTION 87

SRO Tier 2 Group 1

K&A Statement:

Ability to (a) predict the impacts of the following on the STANDBY LIQUID CONTROL SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Abnormal System Flow

Justification:

- A. Incorrect, there is no procedural guidance to gag the relief valve. The relief valve is currently providing protection for the pump, and there is nothing to indicate that this will allow SBLC pump A to inject. Candidates may select this if they believe that this action is allowed and will cause SBLC to begin injecting.
- B. **Correct, although SBLC pump discharge pressure is greater than RPV pressure, tank level has not gone down over 10 minutes. It should have dropped by about 430 gallons from the normal level of 2000 gal. Therefore, SBLC is not injecting and all pump flow is likely returning to the tank via the relief valve since its lift setpoint is 1500#. Although reactor power is dropping slowly, this is likely due to level being lowered as indicated by level at -8" down slow. EO-100-113 directs that RCIC be utilized for boron injection if SBLC injection is unsuccessful.**
- C. Incorrect, see above. Candidates may select this if they incorrectly determine that SBLC is successfully injecting boron.
- D. Incorrect, see above. Candidates may select this if they incorrectly determine that SBLC is successfully injecting boron.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO Candidates must predict the impact of abnormal SBLC system flow and select the correct procedurally directed mitigating strategy to implement.

References: EO-000-113 rev 8, ES-150-002 rev 19 Reference Required none

Learning Objective: 1214.g

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created by: D. Kelly, 12-22-10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 88
SRO ONLY

Unit 1 is in Mode 4 preparing for a plant startup when a review of In Service Testing (IST) program records indicate that the safety function lift setpoint was UNSATISFACTORY for three (3) Safety Relief Valves (S/RV).

All other S/RV's setpoints are satisfactory.

Determine which one of the following is CORRECT and the reason why:

Unit 1 CANNOT transition to Mode 2 until:

- A. ALL THREE (3) of the S/RVs have been repaired because they are required to prevent the reactor vessel from exceeding its design pressure of 1250 psig.
- B. AT LEAST ONE (1) of the S/RVs has been repaired because they are required to prevent the reactor vessel from exceeding its design pressure of 1250 psig.
- C. ALL THREE (3) of the S/RVs have been repaired because they are required to prevent the reactor vessel from exceeding its ASME code pressure limit of 1375 psig.
- D. AT LEAST ONE (1) of the S/RVs has been repaired because they are required to prevent the reactor vessel from exceeding its ASME code pressure limit of 1375 psig.

K&A # 239002 2.2.25
Importance Rating 4.2

QUESTION 88

K&A Statement:

SRO Tier 2 Group 1

Safety Relief Valves:

Equipment Control: Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits

Justification:

- A. Incorrect, the LCO does not require all 3 to be repaired, since 13 SRVs are currently operable, only one needs to be repaired. SRVs do NOT prevent exceeding the RPV design pressure. Candidates may select this if they do not correctly apply TS required actions, nor correctly recall TS basis for SRV operability.
- B. Incorrect, SRVs do NOT prevent exceeding the RPV design pressure. Candidates may select this if they cannot correctly recall the correct TS basis.
- C. Incorrect, the LCO does not require all 3 to be repaired, since 13 SRVs are currently operable, only one needs to be repaired. Candidates may select this if they incorrectly apply TS requirements.
- D. **Correct, TS 3.4.3 requires that the safety function of 14 SRVs are operable, or the plant must be in mode 4. Repair to one SRV will satisfy the LCO to enable transition to mode 2. The purpose of the safety function is to prevent the RPV from exceeding the ASME code limit of 1375 psig following analyzed pressure transients.**

K/A Match Justification:

This question matches the stated K/A since candidates are required to recall the tech spec basis for SRV operability.

SRO Only Justification:

This question is SRO only since candidates must determine the actions required to satisfy tech specs for SRV operability and changing modes, and recall the basis for this tech spec.

References: TS 3.4.3 & bases rev 2 Reference Required TS 3.4.3

Learning Objective: 1655.a, 13400

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)2

Comments: Created by: T. North, 7/12/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 89
SRO ONLY

Unit 1 is operating at full power with the following conditions present:

- "A" TBCCW Pump and Heat Exchanger are in service
- AR-123-G05, "TBCCW HEADER HI-LO TEMP" is received
- TBCCW Cooler Temp TIC-10946 vertical meter is FAILED DOWNSCALE
- TIC-10946 will NOT respond in MANUAL

The Unit Supervisor should enter ON-115-001, "Loss of TBCCW", and direct the...

- A. NPO to throttle OPEN the TBCCW HX Temp CV Bypass Valve (BPV 101083) to LOWER TBCCW header temperature.
- B. NPO to MANUALLY throttle CLOSED the TBCCW HX Temp Control Valve (TV 10946) to RAISE TBCCW header temperature.
- C. PCOM to place the "B" TBCCW heat exchanger in service to LOWER TBCCW header temperature.
- D. PCOM to align emergency service water "A" TBCCW heat exchanger to LOWER TBCCW header temperature.

K&A # 400000 2.4.11
Importance Rating 4.0

QUESTION 89

SRO Tier 2 Group 1

K&A Statement:

Component Cooling Water System:
Emergency Procedures / Plan: Knowledge of abnormal condition procedures.

Justification:

- A. **Correct, the TIC false downscale failure provides input to the TIC to attempt to raise TBCCW header temp by throttling closed TV 10946 to reduce SW flow. This results in high TBCCW temp. ON-115-001 requires that the temperature control valve bypass be manually throttled open locally by NPOs to raise SW flow and reduce TBCCW temp.**
- B. Incorrect, the HI-LO alarm is due to high temp resulting from the TIC failure. The bypass valve should be throttled open to provide additional SW flow to lower TBCCW temps. Candidates may select this if they incorrectly diagnose the result of the TIC failure.
- C. Incorrect, since the TIC and SW control valve are common to both A and B HXs, this will not have the desired effect. Candidates may select this if they do not recall this fact.
- D. Incorrect, this action would only be taken if the CV bypass valve cannot be manually opened. Candidates may select this if they do not correctly recall the proper mitigating strategy sequence.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must recall knowledge abnormal condition procedure ON-115-001 strategy required to mitigate a degradation of the TBCCW system.

References: ON-115-001 rev 17, TM-OP-015 rev 4 Reference Required none

Learning Objective: 15304

Question source: SSES OPS_INITIAL_LICENSE
Bank #AD045/15304 020

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti 01/06/11

QUESTION 90
SRO ONLY

Both units operating at full power with the following conditions:

- Maintenance was investigating a chattering relay inside 0C519A Diesel Generator A Control and Relay Panel and caused Generator Differential 87GX1 relay to trip one hour ago.
- Trouble shooting was unable to determine the cause of the relay trip so NPOs are in the process of substituting Diesel Generator 'E' for Diesel Generator 'A'.
- The Water Treatment NPO just reported that the tap changer on Startup Transformer T-10 has **NOT** changed in the past 36 hours.

Which of the following actions is REQUIRED?

- A. Enter LCO 3.0.3 IMMEDIATELY.
- B. Restore either Diesel Generator "A" or Transformer T-10 within the next 12 hours.
- C. Restore Transformer T-10 to Operable within the next 36 hours.
- D. Restore Diesel Generator "A" to Operable within the next 71 hours ONLY.

QUESTION 91
SRO ONLY

Unit 1 is in MODE 2 conducting a reactor startup with the following conditions present:

- The Reactor is subcritical with SRMs fully inserted and IRMs on Range 1
- Control rod 58-39 (A2SU Step 10) was selected and the operator depressed the W/ DRAW ROD pushbutton.
- An internal power supply fault results in a loss of the PICSY input to RWM and control rod movement stopped.
- An administrative review revealed that the 01-31-2010 startup was conducted with the RWM bypassed.

Assuming today's date is 01-20-2011, which one of the following is correct?

- A. Control rods may **ONLY** be moved by inserting a Reactor scram.
- B. Control rod **WITHDRAWAL** may proceed **WITHOUT RESTRICTION** after the RWM is bypassed.
- C. Control rod **WITHDRAWAL** may continue as long as the RWM is bypassed **AND** a second licensed operator verifies rod movement.
- D. Control rods may be **INSERTED** in reverse sequence **WITHOUT RESTRICTION** after the RWM is bypassed.

K&A # 201006 A2.01
Importance Rating 2.8

QUESTION 91

SRO Tier 2 Group 2

K&A Statement:

Ability to (a) predict the impacts of the following on the ROD WORTH MINIMIZER SYSTEM (RWM) (PLANT SPECIFIC) ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply loss: P-Spec(Not-BWR6)

Justification:

- A. **Correct, Tech Spec 3.3.2.1 Condition C applies. Required actions C.2.1.1 a, C.2.1.2 and C2.2 cannot be performed since only 10 rods have been withdrawn, and the RWM had already been bypassed once during startup within the previous calendar year. Therefore, required action C. 1 is the only action that can be taken.**
- B. Incorrect, Tech Spec 3.3.2.1 Required Action C.2.1.1 requires at least 12 control rods to be withdrawn in order for RWM not to be operable. Candidates may select this if they do not correlate Step 10 of the Rod Pull Sheets as being the 10th control rod withdrawn.
- C. Incorrect, Tech Spec 3.3.2.1 Condition C, Required Action C.1 prevents additional control rod movement during a startup due to less than 12 rods being withdrawn and RWM being bypassed during a startup within the last calendar year. Candidates may select this if they incorrectly determine that a startup wasn't conducted within the last calendar year, which goes back to 01/21/2010.
- D. Incorrect, TS 3.3.2.1 Condition D allows control rods to be inserted during a shutdown as long as Required Action D.1, (2nd licensed operator/qualified person verifies rod movement) is met. Due to the Insert and Withdraw blocks generated by RWM, it must be bypassed. Candidates may select this if they do not correctly apply Condition D requirements.

K/A Match Justification:

This question matches the stated K/A since candidates must predict how the failure of the RWM will impact the startup, and apply a procedural note permitting continuation of the S/U after compliance with TS.

References: GO-100-002 Rev 66, GO-100-004 Rev 53, TS 3.3.2.1 rev 2 Reference Required TS 3.3.2.1

Learning Objective: 12567

Question source: Modified SSES
OPS_INITIAL_LICENSE Bank
#TMOP031D/12567 001

Question History: Modified Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)6

Comments: Modified by: T. North 12/21/10
Reviewed by: M. Jacopetti 01/06/11

QUESTION 92
SRO ONLY

Unit 1 is operating at full power and the quarterly Functional Test of “ATWS-RPT and ARI Trip System Reactor Vessel Low Low Level Channels” is in progress. The I & C Foreman just contacted you and explained:

- When the technicians tested LIS-B21-1N025A they were NOT able to generate annunciator “RECIRC PUMP A HI PRESS/LO LEVEL TRIP” on 1C651 and the green indicator lamp on Panel 1CB224A for LIS-B21-1N025A “REACTOR WATER LEVEL 2” remained EXTINGUISHED.
- In addition, while setting up to test LIS-B21-1N025B it was determined that its equalization valve, IC-LIS-1N025B-EQ, is partially open.

Which one of the following is CORRECT?

- A.
 - BOTH divisions of ATWS-RPT AND ATWS-ARI will still function on low level.
 - Restore the inoperable ATWS-RPT channel within 14 days.
- B.
 - ONE division of ATWS-RPT AND ONE division of ATWS-ARI will still function on low level.
 - Restore the inoperable ATWS-RPT channel within 14 days.
- C.
 - NEITHER division of ATWS-RPT NOR ATWS-ARI will function on low level.
 - Restore ATWS-RPT trip capability within 1 hour AND restore ATWS-ARI trip capability within 14 days.
- D.
 - NEITHER division of ATWS-RPT NOR ATWS-ARI will function on low level.
 - Restore ATWS-RPT trip capability within 72 hours AND restore ATWS-ARI trip capability within 14 days.

K&A # 216000 2.2.40
Importance Rating 4.7

QUESTION 92

SRO Tier 2 Group 2

K&A Statement:

Nuclear Boiler Instrumentation:

Equipment Control: Ability to apply Tech Specs for a system.

Justification:

- A. Incorrect: ATWS - ARI logic requires (A and C) AND (B and D) to function, and RPT requires (A and C) OR (B and D). Since level channels A and B are inop, both divisions are incapable of functioning on low water level for both ARI AND RPT. The candidate may choose this if they confuse the ATWS-RPT and ATWS-ARI logic with the RPS logic, which is (A or B) AND (C or D) and apply tech specs as if that were true.
- B. Incorrect: ATWS – see A above. The candidate may choose this if they confuse the ATWS-RPT and ATWS-ARI logic with the N4S isolation logic, which is (A and B) OR (C and D) and apply tech specs as if that were true.
- C. Incorrect: Both functions of RPT are NOT inop since the high pressure function is unaffected by the LIS failure. Candidates may select this if they incorrectly assume that TS condition C is applicable since neither division of RPT logic is operable.
- D. **Correct: ATWS - ARI logic requires (A and C) AND (B and D) to function, and RPT requires (A and C) OR (B and D). Since level channels A and B are inop, both trip systems are incapable of functioning on low water level for both ARI AND RPT. Therefore, TS 3.3.4.2 condition B applies requiring restoration of RPT capability within 72 hours, and TRM 3.1.1 condition A applies requiring restoration of ARI capability within 14 days. The high pressure function is still operable, therefore, TS 3.3.4.2 Condition 'C' does not apply.**

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate and apply tech specs for multiple inoperable NBI channels.

References:	TM-OP-064C rev 10, TM-OP-058 rev 9, TS 3.3.4.2 amendment 178, TRM 3.1.1 rev 1	Reference Required	TS 3.3.4.2, TRM 3.1.1 redacted
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Learning Objective: 1476

Question source: New

Question History: New

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)2

Comments: Created by: T. North, 1/5/11
Reviewed by: M. Jacopetti 01/06/11

QUESTION 93
SRO ONLY

Unit 1 is operating at 100% power when the Main Turbine trips due to false High Reactor Vessel Level signals.

After the Turbine trip, the Control Room Operators report the following conditions and alarms:

- Auxiliary Buses 11A (1A101) and 11B (1A102) transferred to Startup Bus 10 (0A103)
- Main Generator Sync breaker (1R101) – OPEN
- 230 kV Switchyard Breakers, 3W (Generator 1 West) and 3T (Generator 1 East) – OPEN
- Main Generator Exciter Field Breaker – OPEN
- AR-106-A08, “GEN LOCKOUT RELAYS TRIP”
- AR-106-E08, “GEN ANTI MOTORING TRIP”

What actions must be directed as a result of the above information?

- A.
 - Enter ON-100-101, “Scram, Scram Imminent” and ON-003-001, “Loss Of Startup Bus 10”
 - CONTACT Transmission Control Center (TCC) to investigate the cause of the 3W and 3T 230 KV breaker trip and reclose
 - Re-energize Auxiliary Busses 11A and 11B

- B.
 - Enter EO-100-102, “RPV Level Control” and ON-104-201, “Loss Of 4kv ESS Bus 1A & 1C”
 - CONTACT Transmission Control Center (TCC) to re-energize Auxiliary Busses 11A and 11B
 - Verify “A” & “C” D/Gs running with cooling water

- C.
 - Enter ON-100-101, “Scram, Scram Imminent and ON-193-002, “Main Turbine Trip”
 - CONTACT the Scranton System Operator to investigate the cause of the 3W and 3T 230 kV breaker trip
 - Restart Reactor Recirculation Pumps

- D.
 - Enter ON-198-004, “Unit 1 Main Generator Unable To Disconnect From Grid After A Turbine Trip”
 - CONTACT the Scranton System Operator to block open 230 kV breakers, 3W and 3T
 - Verify AR-106-E08, “GEN ANTI MOTORING TRIP” cleared after 30 seconds

K&A # 245000 A2.05
Importance Rating 3.8

QUESTION 93

SRO Tier 2 Group 2

K&A Statement:

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: Generator Trip

Justification:

- A. Incorrect, The startup bus has not been lost and the Aux buses are still energized. Scranton not the TCC should be contacted to operate the switchyard breakers. If the candidate does not recognize this, this answer may be chosen.
- B. Incorrect, Power was not lost to the Aux buses or the ESS buses. The power supplies to the aux buses have transferred, but power is automatically restored. If the candidate does not recognize this, this answer may be chosen.
- C. **Correct answer. ON-100-101 and ON-193-002 should be entered simultaneously. Scranton should be contacted to operate the switchyard breakers. The RR pumps tripped on EOC-RPT and should be restarted per procedure for forced circulation through the core.**
- D. Incorrect, The main generator has separated from the grid (the Main Generator Sync breaker is open). The operator should not enter ON-198-004. If the candidate does not recognize this, this answer may be chosen.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must predict the effect of the main turbine and main generator trip conditions and determine the correct procedural actions.

References: ON-100-101 rev 25 ; ON-193-002 rev Reference Required None
17

Learning Objective: 15304

Question source: SSES NRC Exam Bank #127

Question History: SSES 2004 NRC Exam

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Created by: Bank
Reviewed by: : M. Jacopetti 01/06/11

QUESTION 94
SRO ONLY

Due to a significant plant transient beyond the design basis of the plant, the Shift Manager has authorized an operation in accordance with 10CFR50.54X.

Which one of the following describes the action(s) required, if any?

NRC notification (1) ; and NRC approval of the actions to be taken (2) .

- A. (1) IS NOT required
 (2) NOT required
- B. (1) IS required and MUST be made BEFORE OR IMMEDIATELY
 AFTER taking action
 (2) NOT required
- C. (1) IS required BEFORE taking action
 (2) IS required
- D. (1) IS required BEFORE taking action
 (2) NOT required

K&A # 2.1.2
Importance Rating 4.4

QUESTION 94

SRO Tier 3

K&A Statement:

Knowledge of operator responsibilities during all modes of plant operation.

Justification:

- A. Incorrect, NRC notification is required. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.
- B. **Correct, per OP-AD-001 NRC notification of 10CFR50.54X actions should be made prior to if practical, or immediately after action has been taken. NRC approval of the action is not required.**
- C. Incorrect, NRC notification can be made immediately after taking action, and NRC approval is not required. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.
- D. Incorrect, NRC notification can be made immediately after taking action. Candidates may select this if they are unfamiliar with SRO responsibilities regarding 10CFR50.54x notification requirements.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must correctly recall their responsibilities with respect to compliance with 10CFR50.54X and OP-AD-001.

References: OP-AD-001 rev 44 Reference Required none

Learning Objective: 14715

Question source: SSES OPS_INITIAL_LICENSE
Bank # AD044/14715 002

Question History: Bank

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 43(b)1

Comments: Created by: Bank
Reviewed by: : M. Jacopetti 01/06/11

QUESTION 95
SRO ONLY

In accordance with NDAP-QA-0726, "10 CFR 50.59 and 10 CFR 72.48 Implementation," which ONE of the following proposed changes would REQUIRE a 10 CFR 50.59 Screen?

- A. Add procedure section to bypass trip setpoints on the Refuel Floor Wall Exhaust Duct Rad monitoring instrument.
- B. Maintenance and refurbishment of the RHR Injection Flow Control Valve HV-151-F017A limiter torque actuator.
- C. Moving the Security perimeter fence to include the entire 500kV yard as part of the onsite facility protected area.
- D. Relocating the TSC emergency response facility from the Control Structure to the West Building.

K&A # 2.2.5
Importance Rating 3.2

QUESTION 95

SRO Tier 3

K&A Statement:

Knowledge of the process for making design or operating changes to the facility.

Justification:

- A. **Correct - Refuel Floor Wall Exhaust Duct Rad Monitor setpoints are required for accident mitigation and SSC operation, therefore 50.59 screening is required**
- B. Incorrect - Not applicable, normal maintenance evolution restores to original design configuration.
- C. Incorrect - Not applicable since outside scope of 50.59; Security systems and designs are regulated by 10 CFR 73.
- D. Incorrect - Not applicable since outside scope of 50.59 screen; Emergency Plan facilities are regulated by 10 CFR 50.47.

K/A Match and SRO Only Justification:

This question matches the stated K/A since SRO candidates must determine whether a specific case meets the requirements of the process for evaluating facility design changes.

References: NDAP-QA-0726 rev 12; LP015 rev 1 Reference Required none

Learning Objective: 15313

Question source: SSES NRC Exam Bank

Question History: SSES 2007 NRC exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 43(b)2

Comments: Created by: Bank
Reviewed by: : M. Jacopetti 01/06/11

QUESTION 96
SRO ONLY

Unit 1 is operating at full power when an unisolable primary system leak occurs inside the RWCU room.

The crew manually scrams the reactor and the following conditions exist:

- HP was contacted to perform offsite dose calculations
- Reactor Building Ventilation SPING Noble Gas indicates $2.8 \text{ E}9 \text{ } \mu\text{Ci}/\text{min}$, up slow
- Containment Radiation Monitors indicate 48 R/hr, up slow
- Main Steam Line Radiation Monitors indicate 12,000 mr/hr, up slow
- Security reports steam exiting the Unit 1 Reactor Building

Which one of the following is the CORRECT action the crew must take?

- A. Stabilize RPV pressure between 800 and 1087 psig per ON-179-002, "Increasing Off Gas MSL Rad Levels", until dose projection information is obtained.
- B. Commence a cooldown at $100^\circ\text{F}/\text{hr}$ using SRVs per EO-100-102, "RPV Control".
- C. Anticipate rapid depressurization and fully open all bypass valves per EO-100-102, "RPV Control".
- D. Rapidly depressurize the RPV using ADS SRVs per EO-100-112, "Rapid Depressurization".

K&A # 2.3.15
Importance Rating 3.1

QUESTION 96

SRO Tier 3

K&A Statement:

Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc

Justification:

- A. Incorrect, criteria for rapid depressurization is met and it is inappropriate to wait for dose projections to determine if General Emergency declaration criteria has been met. Candidates may select this if they adhere to guidance in ON-179-001 that directs delaying Cooldown if possible and do not recognize the requirement to RD if dose projections are not available prior to exceeding 50 R/hr in containment.
- B. Incorrect, see D below. Candidates may select this if they do not recognize that conditions exist requiring RD.
- C. Incorrect, see D below. Candidates may select this if they incorrectly believe that conditions have not yet reached levels requiring RD, but soon will.
- D. **Correct, with rising RB SPING, rising MSL rad monitors, a primary leak into SC, report of steam exiting the RB and containment rads above 50 R/hr, indications of severe fuel damage and offsite release are present. This requires a scram and entry into EO-100-105, Radiation Release, and rapid depressurization per step RR-6.**

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate indications on various installed radiation monitors following a plant transient and determine the correct procedural action to be taken.

References: EO-100-105, rev 3 Reference Required none

Learning Objective: 14586.i, 14586.I, 14586.p

Question source: SSES OP002 Requal Bank
#PP002/14594 050

Question History: Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)4,5

Comments: Revised by: T. North 01/06/11
Reviewed by: M. Jacopetti 01/06/11

QUESTION 97
SRO ONLY

Unit 1 is conducting a reactor shutdown prior to a refueling outage per GO-100-004, "Shutdown To Minimum Power".

The reactor mode switch is placed in SHUTDOWN as directed by the procedure.

Subsequently, Reactor Feed Pumps tripped and High Pressure Coolant Injection system (HPCI) was manually placed in service to maintain RPV water level.

As a result, reactor level dropped to +20", and is subsequently restored to +35".

Determine which of the following actions (if any) are REQUIRED:

- A.
 - Enter ON-100-101, "Scram, Scram Imminent" ONLY.
 - Make a 8 hour ENS notification to the NRC due to the use of HPCI, ONLY.

- B.
 - Enter ON-100-101, "Scram, Scram Imminent" ONLY.
 - Make a 4 hour ENS notification to the NRC due to actuation of RPS, ONLY.

- C.
 - Enter ON-100-101, "Scram, Scram Imminent" AND ON-145-001, "RPV Level Control System Malfunction".
 - Make an 4 hour ENS notification to the NRC due to the use of HPCI ONLY.

- D.
 - Enter ON-100-101, "Scram, Scram Imminent" AND ON-145-001, "RPV Level Control System Malfunction".
 - Make an 8 hour ENS notification to the NRC due the use of HPCI AND a 4 hour notification due to actuation of RPS.

K&A # 2.4.30
Importance Rating 4.1

QUESTION 97

SRO Tier 3

K&A Statement:

Emergency Procedures / Plan: Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Justification:

- A. Incorrect, ON-145-001 entry is required due to the RFPT trip. The HPCI notification is 4 hours since it was manually initiated, which is considered a valid actuation. Candidates may select this if they do not recall that the RPV W/L ON is also required and that the eight hour notification for HPCI is only if it did not inject.
- B. Incorrect, ON-145-001 entry is required due to the RFPT trip and the 4 hour report is not required . Candidates may select this if the believe the scram is reportable and do not recall that the RPV W/L ON is also required since the Rx is scrambled.
- C. **Correct, the scram procedure is required per direction in the GO. The RPV level control malfunction procedure is required due to the RFPT trip. The 4 hour report is required due to HPCI manual actuation to mitigate the water level transient. A 4 hour RPS report is not required since the scram is expected and procedurally directed.**
- D. Incorrect, a 4 hour report for RPS is not required and the HPCI notification is 4 hours since it was manually initiated, which is considered a valid actuation. Candidates may select this if they believe the scram is reportable and HPCI injection isn't since it was manually initiated.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must evaluate plant conditions and determine both the procedures required and the correct NRC notification required.

References: NDAP-QA-0720 attachment K rev 17; Reference Required NDAP-
EO-000-102 rev 9; GO-100-004 rev 53, QA-0720
ON-145-001 rev 27; AR-101-001 rev
42.

Learning Objective: 14585

Question source: MODIFIED SSES
OPS_INITIAL_LICENSE Bank
#PP002/14585 010

Question History: MODIFIED Bank

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Modified by: T. North, 12-10-10
Reviewed by: M. Jacopetti, 01/06/11

QUESTION 98
SRO ONLY

Units 1 and 2 are at 100% power.

'A' Diesel Generator is out of service. Maintenance activities are on-going.

Mechanical Maintenance has requested permission to perform the feed and bleed portion of the work instructions. The feed and bleed will be done on the Jacket Water Stand Pipe by opening the demin water supply, filling the Stand Pipe to the high level, closing the demin water supply and opening the Standpipe Drain to the low level alarm and closing the drain.

Can Maintenance perform the requested actions?

If yes, what additional requirements must be met? If no, why not?

- A. Maintenance CAN perform the requested activities if Ops Supervision has released the appropriate Work Instructions and equipment is CAUTION Tagged.
- B. Maintenance CAN perform the requested activities if Ops Supervision has released the appropriate Work Instructions and equipment is restored prior to the end of the workers shift.
- C. Maintenance CANNOT perform the requested activities Only Operations personnel are allowed to manipulate plant equipment.
- D. Maintenance CANNOT perform the requested activities unless Operations personnel are present to oversee the manipulations.

K&A # 2.2.17
Importance Rating 4.1

QUESTION 98

SRO Tier 3

K&A Statement:

Knowledge of the process for managing maintenance activities during power operations, such as risk assessments, work prioritization, and coordination with the transmission system operator.

Justification:

- A. Incorrect, the procedure states that operations will determine the need for status control tags. If the candidate confuses this with a requirement for caution tags, then this answer will be chosen.
- B. Correct per NDAP-QA-0302 Section 6.6 with operations permission and an appropriate instruction. Operations must be notified if the work is not complete at the end of the shift.**
- C. Incorrect, as a general practice, only operations is allowed to operate plant components, but some exceptions are allowed. If the operator does not recognize that this is a permitted exception, this answer may be chosen.
- D. Incorrect, as a general practice, only operations is allowed to operate plant components, but some exceptions are allowed. If the operator does not recognize that this is a permitted exception, this answer may be chosen.

K/A Match & SRO Only Justification:

This question matches the stated K/A since SRO candidates must determine how a maintenance activity involving operation of plant must be controlled in accordance with station administrative procedures.

References: NDAP-QA-0302 rev 19 Reference Required None

Learning Objective: 15018

Question source: INPO NRC bank # 28740

Question History: SSES 2004 NRC exam

Cognitive level: Memory/Fundamental knowledge: X
Comprehension/Analysis:

10CFR55 43(b)2

Comments: Created/Modified by: Bank
Reviewed by: M. Jacopetti, 01/06/11

QUESTION 99
SRO ONLY

The plant was operating at 20% power. Chemistry reported to the Main Control Room the following chemistry parameters at time:

t = 0

- Reactor pH 8.8
- Reactor Water conductivity 11 $\mu\text{mhos/cm}$
- Reactor Water chlorides 0.150 PPM

At time t = 6 hours, with the plant in Mode 2, Chemistry reports the following:

- Reactor pH 6.5
- Reactor Water conductivity 0.9 $\mu\text{mhos/cm}$
- Reactor Water chlorides 0.150 PPM

Which one of the following actions is appropriate for these plant conditions?

- A. Restore chlorides to within limits by t = 72 hours and verify that the cumulative time exceeding the limit is less than or equal to 336 hours in the past year.
- B. Stay in Mode 2 and restore chlorides to within limits by t = 54 hours or be in Mode 3 by time t = 18 hours and Mode 4 by time t = 42 hours.
- C. Be in Mode 3 by time t = 18 hours and Mode 4 by time t = 42 hours.
- D. Be in Mode 3 by time t = 12 hours and Mode 4 by time t = 36 hours.

K&A # 2.1.34
Importance Rating 3.5

QUESTION 99

SRO Tier 3

K&A Statement:

Knowledge of primary and secondary plant chemistry limits.

Justification:

- A. Incorrect, this is TRM 3.4.1, Condition B less the 6 hours already used. If the candidate does not recognize that Condition B does not apply, this answer may be chosen.
- B. Incorrect, this is the action for Cl out of spec in Mode 2 (TRM 3.4.1 Conditions F and G). If the candidate does not recognize Condition E applies, this answer may be chosen.
- C. Incorrect, this is Condition E If the candidate does not recognize that 6 hours have already passed, this answer may be chosen.
- D. **Correct, Initially conductivity is too high (greater than 1.0) and pH is too high (above 8.6). Chlorides are within spec (<200ppb). Since conductivity is greater than 10, TRM 3.4.1 Condition E applies. Since the event has been in progress for 6 hours, 6 hours are left to reach Mode 3 and 30 Hours are left to reach Mode 4**

K/A Match & SRO Only Justification:

This question matches the stated K/A since SROs must evaluate changes in primary system chemistry values and determine the correct action to be taken based on TRM requirements.

References: TRM 3.4.1

Reference Required TRM
3.4.1

Learning Objective:

Question source: SSES NRC exam bank #264

Question History: Bank, NOT used on '05 or '07 exams

Cognitive level: Memory/Fundamental knowledge:
Comprehension/Analysis: X

10CFR55 43(b)5

Comments: Modified by: Bank
Reviewed by: M. Jacopetti, 01/06/11

QUESTION 100
SRO ONLY

Unit 1 is operating at 2% power.

Maintenance personnel have entered the Drywell to perform emergent repairs on elevation 738'.

Due to expected Xenon burnout reactor power begins to rise slowly.

Determine what action (if any) the crew should take:

- A. Place the mode switch to Shutdown PRIOR to power exceeding 3%.
- B. NO action is necessary unless reactor power approaches 10%.
- C. Direct all personnel to IMMEDIATELY exit the drywell.
- D. Insert Control Rods as necessary to maintain reactor power \leq 3%.

