

SUBJECTIVE SCORE
INSTRUCTOR USE ONLY

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

(T) (F) KEY

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FORM NO. 888-E

IMPORTANT

| | |
|---|---|
| USE NO. 2 PENCIL ONLY | TO USE SUBJECTIVE SCORE FEATURE: • Mark total possible subjective points • Only one mark per line on key • 163 points maximum |
| • MAKE DARK MARKS • ERASE COMPLETELY TO CHANGE • EXAMPLE: <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E | EXAMPLE OF STUDENT SCORE: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/> 13 <input type="checkbox"/> 14 <input type="checkbox"/> 15 <input type="checkbox"/> 16 <input type="checkbox"/> 17 <input type="checkbox"/> 18 <input type="checkbox"/> 19 <input type="checkbox"/> 20 <input type="checkbox"/> 21 <input type="checkbox"/> 22 <input type="checkbox"/> 23 <input type="checkbox"/> 24 <input type="checkbox"/> 25 <input type="checkbox"/> 26 <input type="checkbox"/> 27 <input type="checkbox"/> 28 <input type="checkbox"/> 29 <input type="checkbox"/> 30 <input type="checkbox"/> 31 <input type="checkbox"/> 32 <input type="checkbox"/> 33 <input type="checkbox"/> 34 <input type="checkbox"/> 35 <input type="checkbox"/> 36 <input type="checkbox"/> 37 <input type="checkbox"/> 38 <input type="checkbox"/> 39 <input type="checkbox"/> 40 <input type="checkbox"/> 41 <input type="checkbox"/> 42 <input type="checkbox"/> 43 <input type="checkbox"/> 44 <input type="checkbox"/> 45 <input type="checkbox"/> 46 <input type="checkbox"/> 47 <input type="checkbox"/> 48 <input type="checkbox"/> 49 <input type="checkbox"/> 50 |

PART 1

SCANTRON

| | |
|----------|--|
| NAME | |
| SUBJECT | |
| DATE | |
| TEST NO. | |
| HOUR | |

TEST RECORD

| | |
|--------|--|
| PART 1 | |
| PART 2 | |
| TOTAL | |

TO REORDER CALL 1-800-722-6876 CUSTOMER SERVICE DEPARTMENT

NAME: RO KEY

SS #: _____

COURSE: U1 Initial License ClassDATE: November 23, 2004

GRADE: _____

TRAINING ID: NRC RO/SRO Written Exam

Trainees will be judged to have willfully violated the integrity of an examination if they are found to have:

- Utilized unauthorized documents during the examination.
- Secured unauthorized documents for the purpose of accessibility during an examination.
- Solicited examination information from other trainees or any other individuals.
- Provided examination information to other trainees during an examination.
- Reviewed or attempted to review materials that are unauthorized, including the examination prior to implementation, the examination answer key, or the answers developed by any other trainee during the examination.

I have read and understand the above.

SIGNATURE: _____

DATE: _____

50/1004

| SUBJECTIVE SCORE INSTRUCTOR USE ONLY | | | | | |
|---|----|----|----|----|--|
| 100 | 90 | 80 | 70 | 60 | |
| 50 | 40 | 30 | 20 | 10 | |
| 9 | 8 | 7 | 6 | 5 | |
| 4 | 3 | 2 | 1 | 0 | |

| IMPORTANT | | | | | | | | | | | | | | | | | | | | | |
|---|--|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|----|----|
| <p>USE NO. 2 PENCIL ONLY</p> <p>• MAKE DARK MARKS</p> <p>• ERASE COMPLETELY TO CHANGE</p> <p>• EXAMPLE: (A) (B) (C) (D) (E)</p> | <p>TO USE SUBJECTIVE SCORE FEATURE:</p> <p>• Mark total possible subjective points</p> <p>• Only one mark per line on key</p> <p>• 163 points maximum</p> <p>EXAMPLE OF STUDENT SCORE:</p> <table border="1"> <tr> <td>100</td> <td>90</td> <td>80</td> <td>70</td> <td>60</td> </tr> <tr> <td>100</td> <td>90</td> <td>80</td> <td>70</td> <td>60</td> </tr> <tr> <td>100</td> <td>90</td> <td>80</td> <td>70</td> <td>60</td> </tr> <tr> <td>100</td> <td>90</td> <td>80</td> <td>70</td> <td>60</td> </tr> </table> | 100 | 90 | 80 | 70 | 60 | 100 | 90 | 80 | 70 | 60 | 100 | 90 | 80 | 70 | 60 | 100 | 90 | 80 | 70 | 60 |
| 100 | 90 | 80 | 70 | 60 | | | | | | | | | | | | | | | | | |
| 100 | 90 | 80 | 70 | 60 | | | | | | | | | | | | | | | | | |
| 100 | 90 | 80 | 70 | 60 | | | | | | | | | | | | | | | | | |
| 100 | 90 | 80 | 70 | 60 | | | | | | | | | | | | | | | | | |

| NAME | |
|---------|----------|
| SUBJECT | TEST NO. |
| DATE | HOUR |

| TEST RECORD | |
|-------------|--|
| PART 1 | |
| PART 2 | |
| TOTAL | |

PART 2

FEED THIS DIRECTION

| | (T) | (F) | KEY |
|-----|-----|-----|-----|
| | 100 | 90 | 80 |
| 51 | A | B | C |
| 52 | A | B | C |
| 53 | A | B | C |
| 54 | A | B | C |
| 55 | A | B | C |
| 56 | A | B | C |
| 57 | A | B | C |
| 58 | A | B | C |
| 59 | A | B | C |
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| 63 | A | B | C |
| 64 | A | B | C |
| 65 | A | B | C |
| 66 | A | B | C |
| 67 | A | B | C |
| 68 | A | B | C |
| 69 | A | B | C |
| 70 | A | B | C |
| 71 | A | B | C |
| 72 | A | B | C |
| 73 | A | B | C |
| 74 | A | B | C |
| 75 | A | B | C |
| 76 | A | B | C |
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| 78 | A | B | C |
| 79 | A | B | C |
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| 85 | A | B | C |
| 86 | A | B | C |
| 87 | A | B | C |
| 88 | A | B | C |
| 89 | A | B | C |
| 90 | A | B | C |
| 91 | A | B | C |
| 92 | A | B | C |
| 93 | A | B | C |
| 94 | A | B | C |
| 95 | A | B | C |
| 96 | A | B | C |
| 97 | A | B | C |
| 98 | A | B | C |
| 99 | A | B | C |
| 100 | A | B | C |

25/1/2008

| QUESTION # | REFERENCE PROVIDED FOR USE |
|------------|------------------------------|
| 11 | SFP MAP, CORE MAP, AND PHOTO |
| 12 | EOP-4 |
| 14 | EOP-2, EOP-4 |
| 15 | EOP-2, EOP-4 |
| 17 | EOP-2 |
| 18 | EOP-3 |
| 42 | P&ID C-18014-C, SHEETS 1 & 4 |
| 56 | EOP-3 |
| 67 | P&ID C-180004-C, C-18039-C |
| 69 | N1-ST-Q8B |

EOP-2

EOP-3

EOP-4

SFP MAP, CORE MAP, AND PHOTO

P&ID C-18014-C, SHEETS 1 & 4

P&ID C-180004-C, C-18039-C

N1-ST-Q8B

U.S Nuclear Regulatory Commission

Site-Specific

RO Written Examination

Applicant Information

Name:

Date:

Facility/Unit:

Nine Mile Point Unit 1

Region: I

Reactor Type:

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 six hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

Examination Value

____ / ____ / ____ Points

Applicant's Score

____ / ____ / ____ Points

Applicant's Grade

____ / ____ / ____ Percent

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

1

SYSID: 21001

Points: 1.00

The plant is at 100% power when Reactor Recirculation Pump (RRP) 14 develops a NON-CATASTROPHIC seal leak from both the high-pressure and low-pressure seals. The RO performs the following actions:

- Closes REACTOR R PUMP 14 DISCHARGE VALVE and then applies a momentary (2 second) OPEN signal
- Trips RRP 14
- Closes REACTOR R PUMP 14 SUCTION VALVE and then applies a momentary (2 second) OPEN signal.
- Closes REACTOR R PUMP 14 BYPASS VALVE.
- NO other operator actions are taken.

Which one of the following is the REACTOR POWER LIMIT and the reason for this limit upon completion of these actions?

- A. 90.5% because actions necessary to preclude an inadvertent start of RRP 14 without being warmed are not taken.
- B. 100% because actions necessary to preclude an inadvertent start of RRP 14 with a cold leg are achieved when the pump is isolated.
- C. 90.5% because the APRM flow-biased scram and rod block trip set points are non-conservative until the suction and discharge valves are re-closed.
- D. 100% because the APRM flow-biased scram and rod block trip set points are restored to operable status when the discharge valve is initially closed.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 1 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 1 |
| System ID: | 21001 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-202-1-01, EO-1.6 |

Per N1-OP-1, H.3.0 caution: When operating with four recirculation loops in operation and one loop isolated, reactor power shall be limited to 90.5% unless the following conditions are met to preclude inadvertent startup of a recirculation pump with a cold leg:

1. The suction, discharge, and discharge bypass valves in isolated loop are fully closed and associated motor breakers locked open AND
2. Associated pump motor circuit breaker is open and breaker removed.

Non-conservative Recirc Flowbiased APRM scram and rod block trip setpoints due to the reverse-flow through the non-isolated Recirc Loop still being measured as part of total core flow. The Recirc Flow-biased APRM scram and rod block trip functions are inoperable until the tripped Recirc Pump's associated discharge OR suction valve is "closed". The tripped loop's discharge OR suction valve is still considered "closed" even when it is given an "open" signal for 2-3 seconds for valve stem warm-up, since reverse-flow is negligible.

Following closure, RRP suction and discharge valves are given a 2 to 3 second open signal to provide for valve stem growth to prevent Limitorque lockup.

References Provided None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 1 Cross References (table item links)

10CFR55

- 41(b)(5)
- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295001 AK3.05 3.2/3.6 Reduced loop operating requirements: Plant-Specific. AK3.05 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION: Reduced loop operating requirements.

LP

- O1-OPS-001-202-1-01 Rev. na

Question Source

- New

PROC

- N1-OP-1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

2

SYSID: 21002

Points: 1.00

The plant is at 100% power with no equipment out of service.

- A disturbance on the 115kv line results in a loss of 115kv
- Breakers R10 and R40 open
- Protective relays at Lighthouse Hill clear necessary busses
- Bennetts Bridge auto-transfers to energize the line from Bennetts Bridge to Lighthouse Hill, energizing line #4 to J. A. Fitzpatrick and to NMP1

With respect to the conditions above, which one of the following describes how 115 Kv power will be restored?

- A. Breaker R-40 closes to restore 115 Kv power
- B. Breaker R-10 closes to restore 115 Kv power
- C. Disconnect 178 closes to restore 115 Kv power
- D. Disconnect 8106 closes to restore 115 Kv power

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 2 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 2 |
| System ID: | 21002 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-262-1-01, EO-1.7 |

| | |
|-------------|---|
| Answer: | a. is correct Per N1-OP-33A section B system description, R-40 closes following the disturbance |
| Distractor: | No power available for R-10 |
| Distractor: | Faulted transformer disconnect SW 168 (101N) or SW 178 (101S) opens on transformer lockout. |
| Distractor: | IF reclosure fails, bus sectionalizing disconnect SW 8106 opens AND THEN R10 and R40 attempt another reclosure to re-energize the unfaulted section of the 115 kV bus |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 2 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295003 AA2.04 3.5/3.7 System lineups
AA2.04 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER: System lineups.

Question Source

- New

PROC

- N1-OP-33A Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

3

SYSID: 21003

Points: 1.00

Following a loss of all off-site power the following conditions exist:

- Off-site power has been restored to PB12 from the Station Service Transformer through Breaker R122 and Emergency DG 103 is shutdown.
- PB102 is being supplied by emergency DG 102, Breaker R113 is open
- PB167 is powered from its normal source
- Panel 167A is being supplied from I & C Bus 130.

You have been directed to transfer the power source for PB167A from I & C Bus 130 to PB167

Which one of the following conditions apply to this transfer?

- A. This transfer **CANNOT** be performed at this time because the normal power supply is powering PB167.
- B. The power supply to Panel 167A from I&C Bus 130 must be opened before the power supply from PB167 can be closed.
- C. This transfer **CANNOT** be performed at this time because it would result in both Powerboards being supplied from the same source.
- D. The PB13 Section C to PB13 Section B Tie Breaker must be closed before Breaker #1 from Transformer 167 can be closed.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 3 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 3 |
| System ID: | 21003 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-262-1-02, EO-1.6 |

Answer: B. The power supply to PB167A from PB130 must be opened before the power supply from PB167 can be closed. Opening the power supply from PB130 would de-energize PB167A. This would permit the dead bus transfer as required by N1-OP-30 Precaution and Limitation #19. Understanding that PB167A must be de-energized (dead bus) explains and applies the precaution.

Distractor: This transfer per Abnormal section 52.0 of N1-OP-30 **CANNOT** be performed at this time because this would close a breaker across two out of phase systems. However a dead bus transfer may be performed.

Distractor: The transfer can be performed and it would be much easier if both PBs were supplied from the same source. This distractor is used because several procedural precautions exist about cross-tying PBs and losing divisional separation.

Distractor: Closing the PB13 Section C to PB 13 Section B Tie Breaker would result in attempting to close a breaker between two out of phase systems. Although this breaker lineup is physically possible it is not in any procedure and is prevented by N1-OP-30 Precaution and Limitation #19.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 3 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.32 3.4/3.8 Ability to explain and apply system limits and precautions
- 295003 Partial or Complete Loss of A.C. Power

Question Source

- New

PROC

- N1-OP-30 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

4

SYSID: 21004

Points: 1.00

During a Station Blackout, which one of the following is the reason for performing designated Battery Load Reductions within thirty (30) minutes of the start of the station blackout?

- A. Support a manual dead bus transfer to MG Set 167.
- B. Support a manual dead bus transfer to the standby static battery chargers.
- C. Maintain power to reactor instrumentation, EC controls, and to start an EDG.
- D. Avoid a loss of critical battery board loads due to breaker trips on over current.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 4 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 4 |
| System ID: | 21004 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-263-1-01, EO-1.8

Answer: c. Per OP-47A, B.1.0: With no AC power (loss of both Off-Site power feeds and failure of both Diesel Generators to start), stripping of certain 125 VDC loads is required to ensure sufficient DC capacity for Reactor Instruments, Emergency Condenser controls, and to start a Diesel Generator. Directions for which loads to strip and when is given in N1-SOP-18.

Distractor: b. Static battery chargers are not available until AC power is restored. The Static chargers provide all of the DC power required for normal station operation when AC power is available. When both SR Static chargers for a battery are out of service (one for Q battery) or lose AC power, its associated battery will supply the 125 VDC loads. Each pair of SR static chargers are powered from a separate 600V bus, capable of being fed from the Emergency Diesel Generators, if normal power is lost. With a SBO, diesel generators are not available.

Distractor: a. MG Set 167 (computer supply) may also be aligned to charge the batteries, but is non-safety related. This transfer is performed manually at the Motor Generator Set control cubicle. MG Set 167 has no power. It is a spare and can be used as an emergency power source but has no power. Also, MG 167 DC motor breakers are stripped within 2 hours of the SBO and result in the loss of Process Computer and Annunciators (Alarm Bus).

Distractor: d. Breakers on the SR battery boards have been bypassed. Fuses have been installed in their place in the back of the Battery Boards. Both the Negative and Positive legs to each load are fused.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 4 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295004 AK3.01 2.6/3.1 Load shedding: Plant-Specific
AK3.01 Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER:
Load shedding.

Question Source

- Modified

PROC

- N1-OP-47A Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

5

SYSID: 21005

Points: 1.00

Several minutes after a main turbine trip and reactor scram from 98% power the following conditions exist:

- RPV water level is 79 inches and slowly rising.
- Feedwater flow is less than 1.9×10^6 lbm/hr on motor driven pumps.
- All primary containment parameters are normal.

To restore normal feedwater control which one of the following actions is required prior to depressing the FEEDWATER RETURN TO NORMAL AFTER HPCI pushbuttons?

- A. Reset FW High Level Trip.
- B. Reset FW Level Setpoint Setdown.
- C. Take manual control of 11 & 12 FW FCV's using FW Master Controller.
- D. Take manual control of 11 and 12 FW Flow Control Valves using individual M/A stations.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 5 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 5 |
| System ID: | 21005 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-259-1-01, EO-1.8 |

| | |
|-------------|--|
| Answer: | d. N1-OP-16 directs the operator to take manual control of the FWP Flow Control Valves prior to restoring normal feedwater control. This prevents a FW Flow transient, which would return the FWP Flow Controls Valves to the HPCI mode. |
| Distractor: | a. With HPCI operation, level has not reached Hi Level Trip hence reset the trip serves no function. |
| Distractor: | b. No procedure guidance to reset setdown associated with HPCI return to normal. |
| Distractor: | c. No procedure allowance for using the Master Feedwater Controller for level control following HPCI reset or during HPCI reset. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 5 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295005 AK2.09 4/4.3 Feedwater - HPCI: BWR-2
AK2.09 Knowledge of the interrelations between MAIN TURBINE GENERATOR TRIP and the following:
Feedwater - HPCI: BWR-2.

Question Source

- New

PROC

- N1-OP-16, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

6

SYSID: 21006

Points: 1.00

The plant is at 100% with Feed Water Pump (FWP) #11 and FWP #13 in service. A reactor scram occurs. The following conditions exist immediately after the scram:

- Reactor pressure is 950 psig and steady
- RPV level reached a low of +48 inches
- RPV level is currently +51 inches and is rising slowly
- FW LVL SP SETDN INIT light is OFF
- FW flow is 1.0×10^6 on the Motor Driven pumps

Per SOP-1, Reactor Scram, which one of the following is the required operator action in response to these conditions?

- A. Override FW LEVEL SETPOINT SETDOWN.
- B. Manually initiate FW LEVEL SETPOINT SETDOWN.
- C. Set FEEDWATER MASTER CONTROLLER at +55 inches.
- D. Set FEEDWATER PUMP 11 M/A station at 50% in MANUAL.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 6 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 6 |
| System ID: | 21006 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-006-342-1-01, EO-1.2

Answer:

c. Setpoint set down failed. Per SOP-1 Immediate Operator Action (overrides) set the Master FW controller to +55 inches if FW LVL setpoint setdown fails to initiate (FW LVL SP SETDN INIT light is OFF and should be on; failed to initiate).

Immediately following a reactor scram sensed by a set of RPS Channel 11 and 12 scram relay contacts in RPS BUS 11 CKT 12, coincident with a reactor low water level signal of 52 inches, the K8 initiation relay will **automatically switch control of RPV water level from the master controller ID66 (ID15A) to level controller ID66B with a setpoint of 45 inches.** Relay K9 contacts will light a light on control console E. ID66B will track the output of ID15A (GEMAC M/A Station for FCV #13) to provide a bumpless transfer of the control signal. Setdown of the level setpoint will affect the operation of Feedwater Pump No. 13 Flow

Control Valve FCV-29-134 only. After water level recovers above the low level setpoint of 52 inches, the feedwater level Setdown circuit can be reset using Reset Switch on control console E, or placing 29-169, FW LVL SETPOINT SETDOWN to OVERRIDE, then back to NORMAL. Reactor water level control will return to the master Controller ID66.

An override switch located on Panel F can be also used to override the setdown signal at any time. This override restores normal control to ID66 allowing normal control of FCV #13 from ID15A.

Distractor:

a. There is no benefit to override FW LVL setpoint setdown because it failed. Overriding at this time will not change the state of the circuit.

Distractor:

b. Per SOP-1 Immediate Operator Action (overrides) set the Master FW controller to +55 inches if FW LVL setpoint setdown fails to initiate (FW LVL SP SETDN INIT light is OFF and should be on; failed to initiate). There is no benefit from initiating FW LVL

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

setpoint setdown at this time. Action must be taken to minimize the RPV level rise to stay below the high level trip.

Distractor: d. When RPV level is above +53" (not +51") set FEEDWATER PUMP 11 M/A station at 0% (not 50%) in MANUAL to avoid overfeeding.

References Provided: None

Question 6 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295006 AA1.02 3.9/3.8 Reactor water level control system
AA1.02 Ability to operate and/or monitor the following as they apply to SCRAM: Reactor water level control system.

Question Source

- Bank

PROC

- N1-SOP-01 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

7

SYSID: 21007

Points: 1.00

The following plant conditions exist following a reactor scram:

- Control Room Evacuation is in progress
- Reactor pressure is 1090 psig and lowering slowly
- Reactor water level is 100 inches and lowering slowly
- Both ECs have automatically initiated before establishing control at RSP 11

Per SOP-21.2, Control Room Evacuation, which one of the following actions can be taken to control the cool down rate from RSP 11?

- A. Place CHANNEL 11 CONTROL TRANSFER switch in EMER and then cycle EC Steam Supply IV (39-09R).
- B. Place CHANNEL 11 CONTROL TRANSFER switch in EMER and then cycle EC Condensate Return IV (39-05).
- C. Place EMERGENCY COOLING ISOLATION BYPASS switch in BYPASS and then cycle EC Steam Supply IV (39-09R).
- D. Place EMERGENCY COOLING ISOLATION BYPASS switch in BYPASS and then cycle EC Condensate Return IV (39-05).

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 7 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 7 |
| System ID: | 21007 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-207-1-01, EO-1.7 |

Answer: a. Since the EC auto initiated (>1080 psig for 12 seconds) before control was taken at RSP 11, operation of the EC Condensate Return valve (the desired means) is unavailable therefore the only method to reduce cool down rate is to throttle on the steam supply. To operate the EC from the RSP the CHANNEL 11 CONTROL TRANSFER switch is placed in EMER. The EMERGENCY COOLING ISOLATION BYPASS switch is not operated unless isolation occurs. There is no isolation condition present.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 7 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295016 AA1.07 4.2/4.3, Rev. NA
AA1.07 Ability to operate and/or monitor the following as they apply to CONTROL ROOM ABANDONMENT.
Control room/local control transfer mechanisms.

Question Source

- New

PROC

- N1-OP-13 Rev. NA
- N1-SOP-21.2, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

8

SYSID: 21008

Points: 1.00

The plant was operating at 100% power when SOP-11.1, RBCLC Failure, is entered. The following conditions now exist:

- N1-SOP-11.1 is still being implemented
- RBCLC system flow and pressure have now been stabilized
- Recirc flow has been reduced to 40 Mlbm/hr
- House service loads have been transferred to Reserve Power

Which one of the following RBCLC heat loads is the most limiting and requires the closest monitoring under these conditions until SOP-11.1 can be exited?

- A. Fuel Pool Heat Exchangers.
- B. Instrument Air Compressor Inter-and After Coolers.
- C. FW Booster Pump Oil Coolers.
- D. Off-Gas Vacuum Pump Coolers.

Answer: C

Associated objective(s):

Development Area (FIO)

Question 8 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 8 |
| System ID: | 21008 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-342-1-01, EO-1.2 |

N1-SOP-11.1, Table 11.1

Answer: c. SOP 11.1, Table 11.1, designates FWBP oil as major load. All other loads in distractors are all minor.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 8 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295018 AK1.01 3.5/3.6 Effects on component/system operations
AK1.01 Knowledge of the operational implications of the following concepts as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER: Effects on component/system operations.

Question Source

- Bank

PROC

- N1-SOP-11.1, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

9

SYSID: 21009

Points: 1.00

The plant is operating at 100% power with the following conditions:

- A leak has developed in the 4-inch instrument Air Header
- Instrument Air Pressure is 91 psig and lowering slowly

Assuming no operator action, which one of the following identifies the expected plant response?

- A. Backup compressor will auto-start at 90 psig
- B. Standby compressor will auto-start at 85 psig
- C. Service air cross-connect, BV 94-19 will open at 90 psig
- D. Breathing air cross-connect, BV 114-02 will open at 85 psig

Answer: C

Associated objective(s):

Development Area (FIO)

Question 9 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 9 |
| System ID: | 21009 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-278-1-01, EO-1.4 Reference(s): N1-OP-20 H.2.0 |

Distractors: No changes - This question tests the ability of the student to recall the correct setpoint for automatic operations of IAS components. All setpoints provided are correct under different conditions than presented in the question.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 9 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295019 AA2.01 3.5/3.6 Instrument air system pressure
AA2.01 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:
Instrument air system pressure.

Question Source

- Bank

PROC

- N1-OP-20 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

10

SYSID: 21010

Points: 1.00

The plant is in cold shutdown. An inadvertent closure of a shutdown cooling isolation valve results in a loss of shutdown cooling.

Which one of the following is required to prevent thermal stratification?

- A. Place one Reactor Recirculation loop in service.
- B. Manually initiate one or both Emergency Condensers.
- C. Ensure Vessel level is maintained above the Main Steam Line nozzles.
- D. Establish RBCLC flow to the Cleanup non-regenerative heat exchanger.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 10 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 10 |
| System ID: | 21010 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-205-1-01, EO-1.6 |

Answer: a.N1-OP-4, Section D. Precautions and Limitations, #s 8.0 and 17.0 are the operators responsibilities for preventing thermal stratification in the RPV. The requirements are to have one Reactor Recirculation loop in service or shutdown cooling in service with RPV water level above the Main Steam Line Nozzles. With no shutdown cooling starting a recirculation loop is required to prevent thermal stratification.

Distractor: b.Manually initiating one or both Emergency Condensers will remove heat if boiling begins in the core but it will not prevent thermal stratification. OP-43C references use of EC's during loss of SDC.

Distractor: c.Ensuring Vessel level is maintained above the Main Steam Line nozzles is only successful with Shutdown Cooling in service. (OP-1 Section G.1) Just raising RPV water level above the MSLs will not prevent thermal stratification.

Distractor: d.Establishing flow through the Cleanup system with maximum non-regen flow will remove heat but it will not prevent thermal stratification.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 10 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.2 3/4 Knowledge of operator responsibilities during all modes of plant operation
- 295021 Loss of Shutdown Cooling

Question Source

- New

PROC

- N1-OP-4 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

11

SYSID: 21209

Points: 1.00

The plant is in a refueling outage with the first FUEL SHUFFLE in progress. A fuel assembly is being moved from reactor core location 07-24 to spent fuel pool Rack3 A36. With this fuel assembly in the position shown in the **ATTACHED PHOTOGRAPH**, spent fuel pool and reactor cavity level are observed to be lowering at 2 inches per minute.

Per N1-SOP-6.1, Loss of SFP/RX Cavity/DHR, which one of the following states the correct action that will mitigate the consequences of this event **QUICKEST** including the threshold to be monitored for a required evacuation of **ESSENTIAL** personnel from the refuel floor while the action is taken?

- A. Release this component in any open location in the area it is being moved to. Evacuate if spent fuel pool level lowers to 338' elevation.
- B. Release this component in any open location in the area it is being moved to. Evacuate if the RB340 Refuel High Range monitor alarms.
- C. Return to and release this component in the location it was removed from. Evacuate if spent fuel pool level lowers to 338' elevation.
- D. Return to and release this component in the location it was removed from. Evacuate if the RB340 Refuel High Range monitor alarms.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 11 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 11 |
| System ID: | 21209 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-SOP-6.1, Path A override and actions
ARP L1-4-3
ARP L1-3-5

Answer:

b. Per N1-SOP-6.1: The appropriate action is to return to the nearest storage location in the spent fuel pool or reactor core, core components that are being transferred. For the conditions presented, continue to and release the component in an unoccupied location in the spent fuel pool. In the picture an irradiated fuel assembly is being transported to the fuel pool and is currently in the fuel transfer canal (between the reactor cavity and the spent fuel pool). The assigned location this fuel assembly is being moved to in the fuel pool and other locations in the fuel pool near the fuel transfer canal entrance to the fuel pool are much closer than the core location that this fuel assembly was removed from. The time to place this fuel assembly into its assigned spent fuel pool rack location or other unoccupied locations in the spent fuel pool is less than the time to return the fuel assembly to its original location (which is at a reactor core location almost furthest away from the fuel transfer canal entrance to the reactor cavity) and then lower and release the fuel assembly. Also, the seated elevation of a fuel assembly in a fuel rack is above the upper grid (top guide) in the reactor core.

Per N1-SOP-6.1: evacuation of the RB340' elevation (refuel floor) is required if irradiated fuel bundle has been uncovered or refuel bridge high radiation alarm sounds. The 338' elevation in the spent fuel pool is the set point for the low level alarm, which is still well above fuel pool levels that would contribute to higher radiation levels on the refuel floor or would contribute to the uncovering of a fuel assembly. With this fuel bundle normal up (its in the transfer canal) there is approximately 8 feet of water shielding above the irradiated fuel. 338' elevation of spent fuel pool level is only a loss of a small amount of water level.

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Distractor: a. See above justification.

Distractor: c. See above justification.

Distractor: d. See above justification.

**References Provided: SPENT FUEL POOL MAP,
CORE MAP, PHOTOGRAPH OF IRRADIATED FUEL
ASSEMBLY IN THE FUEL TRANSFER CANAL.**

Question 11 Cross References (table item links)

10CFR55

- 41(b)(10)
- 41(b)(13)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295023 AK1.01 3.6/4.1 Radiation exposure hazards
AK1.01 Knowledge of the operational implications of the following concepts as they apply to REFUELING ACCIDENTS: Radiation exposure hazards.

Question Source

- New

PROC

- N1-ARP-L1-3-5, Rev. NA
- N1-SOP-6.1, Rev. NA
- N1-ARP-L1-4-3, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

12

SYSID: 21012

Points: 1.00

The CRS announces entry into EOP-8, RPV Blowdown because containment parameters are challenging the Pressure Suppression Pressure capability.

Which one of the following is the reason for RPV Blowdown at this time?

Depressurize the reactor while the:

- A. torus is still available as a heat sink.
- B. drywell is still within its design pressure.
- C. torus can still remain within its design temperature limit.
- D. drywell can still remain within its design temperature limit.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 12 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 12 |
| System ID: | 21012 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-04, EO-1.3 |

Answer: a. Depressurize the reactor while the torus is still available as a heat sink. Going down the primary containment pressure leg of EOP-4, Primary Containment Control, when parameters are going outside the GOOD area of PSP blowdown is required. Assuming torus level is not a problem (although this would still inop the torus as a heat sink) the problem is that rising pressure in the torus and drywell are reducing the free air space of the torus. While sufficient free air space exists (torus still available as a heat sink) the RPV must be blowdown. That is the reason for RPV Blowdown on rising drywell pressure.

Distractor: b. The drywell is still within its design pressure at this time and will remain within its design pressure for some time after these conditions.

Distractor: c. The torus design temperature limit has no relationship with primary containment pressure and torus level. The Heat Capacity Temperature limit compares torus temperature with reactor pressure to determine the capability of the torus to serve as a heat sink. PSP looks at different parameters.

Distractor: d. The drywell design temperature limit has no relationship with primary containment pressure and torus level. This limit may also require an RPV Blowdown but drywell temperature is not a factor in evaluating PSP.

References Provided: EOP-4

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 12 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295024 EK3.04 3.7/4.1 Emergency depressurization
EK3.04 Knowledge of the reasons for the following responses as they apply to HIGH DRYWELL
PRESSURE: Emergency depressurization.

Question Source

- New

PROC

- N1-EOP-4 Rev. NA
- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

13

SYSID: 21013

Points: 1.00

Given these conditions:

- The plant is operating at 100% power
- EPR is in control with a setpoint of 920 psig
- MPR setpoint is 930 psig
- Both regulators are sensing 960 psig

A failure of the EPR causes the EPR to sense reactor pressure at 970 psig and rising.

Which one of the following describes main turbine control response?

- A. MPR takes control and opens TCVs until 1060 psig.
- B. MPR takes control and maintains pressure at 970 psig.
- C. EPR remains in control and closes TCVs until 1080 psig.
- D. EPR remains in control and lowers pressure to 850 psig.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 13 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 13 |
| System ID: | 21013 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-248-1-01, EO-1.8 |

Answer: d. Because the pressure regulator with the highest valve demand (lowest setpoint) is in control the EPR will remain in control and TCVs open in response to the sensed rising pressure this will cause the EPR to open the TCVs (and eventually the BPVs). This will lower pressure until the 850 psig MSIV isolation.

Distractor: a.MPR takes control and opens TCVs until 1060 psig. This response is based on the upper limit of the MPR. The MPR will not take control because it's output is limited to the 30 psi d/p it senses between its setpoint and sensed pressure.

Distractor: b.MPR takes control and maintains pressure at 970 psig. This response is based on the MPR taking control from the EPR. The MPR will not take control from the EPR

Distractor: c. EPR remains in control and closes TCVs until 1080 psig. This is based on the EPR closing TCVS until a reactor scram occurs. The EPR will be opening TCVs on a sensed higher pressure, lowering RPV pressure.

References provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 13 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295025 EK2.08 3.7/3.7 Reactor/turbine pressure regulating system: Plant-Specific EK2.08 Knowledge of the interrelations between HIGH REACTOR PRESSURE and the following: Reactor/turbine pressure regulating system.

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

14

SYSID: 21014

Points: 1.00

The plant was operating at 100% power, when an ERV opened and remained stuck open. Which of the following identifies the correct EOP action and the bases for this action?

- A. Before 95° F in the torus initiate a plant shutdown. This ensures torus temperature does not exceed the upper limit of the Containment Spray NPSH requirements in the event of an accident.
- B. Before 100° F in the torus, place Containment Spray in service for torus cooling. To prevent exceeding 110°F in the torus.
- C. Before 105° F in the torus initiate a power reduction to prevent the eventual exceeding of the Heat Capacity Temperature Limit.
- D. Before 110° F in the torus, place mode switch in shutdown. To reduce the rate of energy production and thus the heat input to the torus.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 14 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 14 |
| System ID: | 21014 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-04, EO-1.3 |

Answer: d. At 110° F in the torus, place mode switch in shutdown. To reduce the rate of energy production and thus the heat input to the torus. This is the EOP required action and is the only torus temperature mentioned in the EOP. The basis for the 110 limit is specified in EOP basis N1-ODP-PRO-0305.

Distractor: a. Before 95° F in the torus initiate a plant shutdown. This ensures torus temperature does not exceed the upper limit of the Containment Spray NPSH requirements in the event of an accident. This is not an EOP action and the bases is not associated with the temperature.

Distractor: b. Before 100° F in the torus, place Containment Spray in service for torus cooling. To prevent exceeding 110°F in the torus. This is not an EOP action and the bases is not associated with the temperature.

Distractor: c. Before 105° F in the torus initiate a power reduction to prevent the eventual exceeding of the Heat Capacity Temperature Limit. This is not an EOP action and the bases is not associated with the temperature.

References Provided: EOP-2, EOP-4

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 14 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295026 EK3.05 3.9/4.1 Reactor SCRAM
EK3.05 Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL
HIGH WATER TEMPERATURE: Reactor SCRAM.

Question Source

- New

PROC

- N1-ODP-PRO-0305 Rev. NA
- N1-SOP-1.4 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

15

SYSID: 21023

Points: 1.00

During conduct of the EOPs, the following conditions exist.

- Fuel zone level indicates zero (0) inches
- Reactor pressure is 50 psig
- Drywell pressure is 8 psig
- Drywell temperature elevation 319' is 302°F
- Drywell temperature elevation 263' is 275°F
- Drywell temperature elevation 230' is 250°F
- Drywell bulk average temperature is 270°F

In addition to the fuel zone instruments, which one of the following level instruments is available (if any) if actual reactor water level is zero (0) inches?

- A. Lo-Lo-Lo instruments.
- B. Wide Range instruments.
- C. Hi/Lo-Lo/Lo Rosemount instruments.
- D. No other instruments can be used.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 15 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 15 |
| System ID: | 21023 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-006-344-1-04, EO-1.2

Answer:

d. Per EOP Detail A: For all instruments except fuel zone, do not use if drywell temperature near the instrument runs (319' elevation) is at or above the RPV Saturation Temperature (Figure B) OR the instrument reads at or below the minimum usable level.

The 319' elevation temperature at 300°F concurrent with reactor pressure at 50 psig is within the BAD region of the RPV Saturation Temperature (Figure B) therefore other level instruments are unavailable. The other temperatures indicated are within the GOOD region of the RPV Saturation Temperature (Figure B) and therefore could be used if above the minimum usable level such as the Lo-Lo-Lo instruments.

Distractor:

a. Lo-Lo-Lo instruments are above the minimum usable level but cannot be used because within the BAD region of the RPV Saturation Temperature (Figure B). Three of the four drywell temperatures are within the GOOD region of the RPV Saturation Temperature (Figure B).

Distractor:

b. Wide Range instruments are below the minimum usable level and cannot be used. Also within the BAD region of the RPV Saturation Temperature (Figure B). Three of the four drywell temperatures are within the GOOD region of the RPV Saturation Temperature (Figure B).

Distractor:

c. Rosemount instruments are below the minimum usable level but could be inferred as at or above the minimum usable level if the incorrect temperature is used. Also, cannot be used because within the BAD region of the RPV Saturation Temperature (Figure B). Three of the four drywell temperatures are within the GOOD region of the RPV Saturation Temperature (Figure B).

References Provided: EOP-2 AND EOP-4

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 15 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.6 3.1/4 Knowledge symptom based EOP mitigation strategies
- 295028 High Drywell Temperature

Question Source

- New

PROC

- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

16

SYSID: 21221

Points: 1.00

Which one of the following is the Technical Specification (TS) implication of a torus water level at 10.4 feet?

- A. The downcomer submergence is above the TS maximum allowable value of 3.5 feet.
- B. The downcomer submergence is above the TS maximum allowable value of 4.25 feet.
- C. The downcomer submergence is below the TS minimum required value of 3.5 feet.
- D. The downcomer submergence is below the TS minimum required value of 4.25 feet.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 16 Details

| | |
|-------------------|-------------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 16 |
| System ID: | 21221 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | TS 3.3.2.a N1-ST-DO 10.1.6 |

Answer: c. Per TS 3.3.2,a: The downcomers in the suppression chamber shall have a minimum submergence of three and one half feet (3.5') and a maximum submergence of four and one quarter (4.25') feet whenever reactor coolant system temperature is above 215°F and primary containment integrity is required.

Distractor: a. Torus water level is low. The maximum allowable downcomer submergence is 4.25 feet not 3.5 feet.

Distractor: b. This answer would be correct if torus water level was at 11.3 feet (high) and not low.

Distractor: d. The TS minimum required downcomer submergence is 3.5 feet not 4.25 feet. 4.25 feet is maximum downcomer submergence.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 16 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.33 3.4/4 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications
- 295030 Low Suppression Pool Water Level

Question Source

- New

PROC

- N1-ST-DO, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

17

SYSID: 21017

Points: 1.00

A plant transient has resulted in the following conditions:

- Reactor pressure 150 psig
- No ERVs open
- RPV water level -118"
- The only injection source is one (1) Control Rod Drive (CRD) Hydraulic Pump

Which one of the following is the condition of ADEQUATE CORE COOLING (ACC) with these conditions present?

- A. There is NO assurance of ACC.
- B. Core submergence ensures ACC
- C. Steam cooling with injection ensures ACC.
- D. Steam cooling WITHOUT injection ensures ACC.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 17 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 17 |
| System ID: | 21017 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-01, EO-1.3 |

| | |
|-------------|---|
| Answer: | a. is correct. Adequate Core Cooling cannot be assured because none of the mechanisms exist for ACC. RPV level is below Top of Active Fuel (TAF is -84 inches) and RPV level is below Minimum Steam Cooling RPV Water Level (-109 inches) with injection from CRD. |
| Distractor: | b. incorrect. Core submergence does not exist with RPV water level below Top of Active Fuel (TAF is -84 inches) |
| Distractor: | c. incorrect. Steam Cooling with injection is employed in EOP-2, RPV Control only if RPV water level is above Minimum Steam Cooling RPV Water Level (-109 inches), which it is not, with level at -119 inches. (EOP Bases, Definitions page 61) |
| Distractor: | d. incorrect. Steam Cooling without injection is employed in EOP-9, Steam Cooling. With RPV water level below Minimum Steam Cooling RPV Water Level (-109 inches) and any injection source is lined up (one CRD pump) then ACC does not exist by Steam Cooling without injection, since EOP-9 Steam Cooling is not entered under these conditions. If entered override will direct exiting, with any injection source injecting. "ACC cannot be assured if RPV water level is below Minimum Steam Cooling RPV Water Level (-109 inches) and water is being injected into the RPV". (EOP Bases, EOP-9, page 281) |

References Provided: EOP-2

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 17 Cross References (table item links)

10CFR55

- 41(b)(8)

Cognitive Level

- 2

Difficulty Level

- Level 4: Highest order knowledge item requiring use of problem solving skills, judgement, and maximum task complexity as well as applying procedures to determine correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295031 EK1.01 4.6*/4.7* Adequate core cooling
EK1.01 Knowledge of the operational implications of the following concepts as they apply to REACTOR
LOW WATER LEVEL: Adequate core cooling.

Question Source

- New

PROC

- N1-EOP-2 Rev. NA
- N1-EOP-9 REV. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

18

SYSID: 21018

Points: 1.00

The plant is in an ATWS with the following conditions established:

- RPV level is being maintained between -70 inches and -109 inches
- Liquid Poison (LP) injected using SYS 11
- LP Tank Level recorded at 1400 gallons when LP injection initiated

Which one of the following LP Tank Levels is the MAXIMUM LEVEL that when achieved allows restoration of RPV level to above +53 inches?

- A. 1050 gallons.
- B. 800 gallons
- C. 600 gallons
- D. 350 gallons.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 18 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 18 |
| System ID: | 21018 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-03, EO-1.2 |

Answer: b. Hot shutdown boron weight (600 gallons) must be injected and then RPV level can be raised to above +53 inches. Hot shutdown boron weight (600 gallons) subtracted from the tank volume when LP injection initiated (1400 gallons) equates to 800 gallons (1400 gallons - 600 gallons = 800 gallons)

Distractor: a. 1050 gallons is the total volume to be injected which equates to cold shutdown boron weight. Only the hot shutdown boron weight must be injected

Distractor: c. 600 gallons is the total volume to be injected which equates to hot shutdown boron weight. (1400 gallons - 600 gallons = 800 gallons)

Distractor: d. Cold shutdown boron weight (1050 gallons) is the incorrect value. Subtracted from the tank volume when LP injection initiated (1400 gallons) equates to 350 gallons. (1400 gallons - 1050 gallons = 350 gallons)

References Provided: EOP-3

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 18 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295037 EA2.03 4.3*/4.4* SBLC tank level
EA2.03 Ability to determine and/or interpret the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN: SBLC tank level.

Question Source

- New

PROC

- N1-EOP-3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

19

SYSID: 21019

Points: 1.00

A release of radioactivity is in progress. The following radiological conditions are observed.

- Main Stack OGESMS shows rising radiation levels.
- Turbine Building Ventilation PING, shows elevated radiation levels
- Reactor Building Ventilation radiation monitors are reading normal.

Which one of the following describes the probable source of the release?

- A. Fuel Clad failure release thru Offgas.
- B. Main Steam leakage outside the Primary Containment.
- C. Recirculation Pump seal leakage with Primary Containment leakage.
- D. Reactor Water Cleanup leakage outside the Primary Containment.

Answer: B

Associated objective(s):

Development Area (FIO)

Question 19 Details

| | |
|-------------------|---------------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 19 |
| System ID: | 21019 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Created from 1998 NRC 18322 ILO |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 19 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295038 EA2.04 4.1*/4.5* Source of off-site release
EA2.04 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE
RATE: Source of off-site release.

Question Source

- Bank

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

20

SYSID: 21020

Points: 1.00

The plant is at 100% power when the following annunciators are received on the Control Room Main Fire Panel 2-2:

- 2-2-5-2, DSL FIRE PUMP #1 LOW STARTING AIR-FUEL OIL
- 2-2-1-2, DIESEL FIRE PUMP #1 RUNNING
- NO other alarms are received

Which one of the following is the cause of Diesel Fire Pump #1 start?

- A. Fuel system is leaking causing a low day tank level.
- B. Air system is leaking causing a low starting air pressure.
- C. Deluge system initiated beyond the diesel fire pump capacity.
- D. Deluge system initiated beyond the electric fire pump capacity

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 20 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 20 |
| System ID: | 21020 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-286-1-01, EO-1.7 |

Answer: b. DFP starts on low air start pressure of 73 psig. Alarm on low starting air pressure is 80 psig. Alarm on low day tank level is 175 gallons but does not cause a start of the DFP.

Distractor: a. Alarm on low day tank level is 175 gallons but does not cause a start of the DFP. Only 2-2-5-2 would be received

Distractor: c.If a fire system actuated causing a start of the DFP then the electric fire pump would also be running and alarm 2-2-2-2 ELECTRIC FIRE PUMP #1 STARTED would be in alarm. The electric fire pump starts first and then the DFP is system pressure lowers below 100 psig. Suppression system actuation causing fire pump start(s) not cause 2-2-5-2 to alarm.

Distractor: d.With the electric fire pump running alarm 2-2-2-2 ELECTRIC FIRE PUMP #1 STARTED would be in alarm also. Also suppression system actuation causing fire pump start(s) not cause 2-2-5-2 to alarm.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 20 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.31 3.3/3.4 Knowledge of annunciators alarms and indications, and use of the response instructions
- 2.4.31 Knowledge of annunciators alarms and indications / and use of the response instructions.

Question Source

- New

PROC

- N1-ARP-A2,2-2 Rev. na
- N1-ARP-A2-2-5-2, Rev. NA
- N1-ARP-A2-2-1-2, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

21

SYSID: 21021

Points: 1.00

A scram from 100% power occurs, with the following sequence of events:

- FWP 11 pump is running in the HPCI mode with its control switch RED flagged.
- FWP 12 pump is running in the HPCI mode with its control switch GREEN flagged.
- RPV water level is 60 inches and rising.
- RO depresses the FEEDWATER RETURN TO NORMAL AFTER HPCI CH 11 & 12 pushbuttons.
- RPV water level rises to +95 inches.
- When RPV water level subsequently lowers to +80 inches, BOTH Motor Feedwater Pump High Level Trip Bypass switches are placed to Bypass and then back to Normal.
- FWP 11 starts.

Which one of the following operator actions would have prevented FWP 11 start, per N1-SOP-1 Reactor Scram?

- A. Operating FWP must be placed in PTL prior to resetting HI LEVEL trip.
- B. Level Bypass Switches must be left in Bypass until level is in the normal band.
- C. FWP FCV must be fully closed or the open demand signal will cause a pump start.
- D. HPCI Logic must be reset by placing FWP control switches to Stop spring return to Normal.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 21 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 21 |
| System ID: | 21021 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-342-1-01, EO-1.2 |

| | |
|-------------|---|
| Answer: | d. The HPCI Logic must be reset by placing the FWP control switches Stop spring return to Normal. |
| Distractor: | a. Placing the operating FWP in PTL prior to resetting HI LEVEL trip will prevent the start however, it is not part of the procedural response. |
| Distractor: | b. Leaving Level Bypass Switches in Bypass until level is in the normal band is not part of the procedure – these switches are repositioned only momentarily. |
| Distractor: | c. The FWP FCV must be fully closed or the open demand signal will cause a pump start – the position of the FCV has no input to the pump start logic. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 21 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

DER

- NM-2004-3961, Rev. NA

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.23 3.9/4 Ability to perform specific system and integrated plant procedures during different modes of plant operation
- 295008 High Reactor Water Level

Question Source

- New

PROC

- N1-SOP-1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

22

SYSID: 21222

Points: 1.00

Unit 1 plant conditions are:

- Reactor scram five (5) hours ago
- RPV water level is unknown and EOP-7, RPV Flooding is entered
- RPV remained flooded for 101 minutes per EOP-7, RPV Flooding
- RPV reference legs have been filled
- Injection was terminated five (5) minutes ago per Step 21
- All level indicators have remained upscale for the past five (5) minutes

Which one of the following is the correct action in response to the above conditions?

- A. Immediately take action to reflood the reactor vessel.
- B. Immediately exit RPV Flooding and enter RPV Control.
- C. Wait 3 minutes before either reflooding or exiting to RPV Control.
- D. Wait 8 minutes before either reflooding or exiting to RPV Control.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 22 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 22 |
| System ID: | 21222 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-EOP-7

N1-ODP-PRO-0305, page 259 and 260 discussions

Answer:

c. This question applies an understanding of the limits imposed within the RPV Flooding procedure for RPV level instrumentation and the maximum core uncover time limit. For the conditions presented, the maximum core uncover time limit is 8 minutes. With injection terminated per step 21 for 5 minutes, 3 minutes remain to observe a level indicator response before either taking action to reflood the reactor vessel or determine RPV water level can be determined and exit EOP-7 and enter EOP-2. When determining an "RPV level instrument is available" versus "RPV water level can be determined": An RPV water level instrument may be considered "available" if it is believed that the instrument will respond properly to changes in actual level. Electrical power must be available, system piping intact, and the reference legs full. The instrument does not have to be on-scale, operating within calibration conditions, or providing an accurate reading. A drywell temperature of 212°F bounds the RPV Saturation Temperature when the RPV is depressurized. If drywell temperature is above the RPV Saturation Temperature, water in the instrument runs may start to boil resulting in unreliable indication. For the conditions presented, if injection has been terminated per Step 21, then the RPV level instruments are available and drywell temperature is below 212°F. Also the question states the reference legs have been filled. If the candidate misinterprets this limitation they may determine that RPV level can be determined and immediately exit to EOP-2 which is incorrect.

Distractor:

a. Based on incorrect determination and application of the Max Core Uncover Time Limit, then flooding conditions would be reestablished for 101 minutes.

Distractor:

b. When determining an "RPV level instrument is available" versus "RPV

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

water level can be determined": An RPV water level instrument may be considered "available" if it is believed that the instrument will respond properly to changes in actual level. Electrical power must be available, system piping intact, and the reference legs full. The instrument does not have to be on-scale, operating within calibration conditions, or providing an accurate reading. A drywell temperature of 212°F bounds the RPV Saturation Temperature when the RPV is depressurized. If drywell temperature is above the RPV Saturation Temperature, water in the instrument runs may start to boil resulting in unreliable indication. For the conditions presented, if injection has been terminated per Step 21, then the RPV level instruments are available and drywell temperature is below 212°F. Also the question states the reference legs have been filled. If the candidate misinterprets this limitation they may determine that RPV level can be determined and immediately exit to EOP-2 which is incorrect.

Distractor:

d. For the conditions presented, the maximum core uncover time limit is 8 minutes. With injection terminated per step 21 for 5 minutes, 3 minutes remain to observe a level indicator response before either taking action to reflood the reactor vessel or determine RPV water level can be determined and exit EOP-7 and enter EOP-2, not 8 minutes. If wait for 8 minutes then the core would be inadequately cooled.

References Provided: EOP-7

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 22 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.32 3.4/3.8 Ability to explain and apply system limits and precautions
- 295009 Low Reactor Water Level

Question Source

- New

PROC

- N1-EOP-7 Rev. NA
- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

23

SYSID: 21213

Points: 1.00

In response to which one of the following events will fuel temperature act first to change the reactivity addition to the core?

- A. The Main Turbine trips at 100% power.
- B. ERV 111 opens and remains open at 100% power.
- C. Control rod 26-27 free-falls from full in to full out at 100% power.
- D. FW heater 11 extraction steam becomes isolated at 100% power.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 23 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 23 |
| System ID: | 21213 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: Fuel Temperature. |

Answer: c.

Per the FSAR, the results of the accident analysis for the Control Rod Drop Accident show that in all cases the peak fuel enthalpy will rise but would be much less than the 280 cal/gm design limit.

For this accident, power increases due to increased fuel added to the effective core (or decreased absorption in control rods) and leads to an increase in the number of fissions, which increases the amount of energy released in the fuel. The fuel temperature will increase rapidly. The fuel thermal time constant limits the removal of heat from the fuel by the moderator. As fuel temperature rapidly increase, the Doppler coefficient adds negative reactivity. More neutrons are lost to resonance absorption and reactor power begins to turn (rate of increase slows and then decreases).

Distractor: a. This is a pressure increase transient - voids will be changed first.

Distractor: b. This is a pressure decrease transient - voids will be affected first.

Distractor: d. This will result in cold water being added to core.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 23 Cross References (table item links)

10CFR55

- 41(b)(1)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295014 AK2.03 3.3/3.4 Fuel temperature, Knowledge of the interrelations between INADVERTENT REACTIVITY ADDITION and the following: fuel temperature.

Question Source

- Bank

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

24

SYSID: 21024

Points: 1.00

An ATWS has occurred, with the following:

- Power stabilized at 7%
- Scram air header pressure is 0 psig
- CSO was directed to continue with the actions in EOP 3.1, Alternate Rod Insertion

Which one of the following methods will be used by the CSO to insert the control rods?

- A. Remove the RPS scram fuses
- B. Operate Individual Rod Scram Switches
- C. Bypass the RWM and drive rods manually
- D. Drive control rods by raising cooling water pressure

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 24 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 24 |
| System ID: | 21024 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-11, EO-1.2 |

| | |
|-------------|--|
| Answer: | c. Bypass the RWM and drive rods manually |
| Distractor: | a. Remove the RPS scram fuses will have no effect if cause is the hydraulic lock |
| Distractor: | b. Operating individual Rod Scram switches will have no effect because the scram air header is already depressurized. |
| Distractor: | d. Drive control rods by raising cooling water pressure may work but will be less effective than using the RMCS due to longer time and raised exposure and |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 24 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295015 AA1.03 3.6/3.8 RMCS: Plant-Specific
- 295015 INCOMPLETE SCRAM/1 AA.1.03 Ability to operate and/or monitor the following as they apply to INCOMPLETE SCRAM: RMCS

Question Source

- New

PROC

- N1-EOP-3.1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

25

SYSID: 21025

Points: 1.00

A plant startup is in progress, with the following:

- 07:55: Cleanup High Pressure Control Valve just placed in service per N1-OP-3
- 08:00: F3-1-2, CONTROL ROD DRIVE PUMP 11 TRIP-VIB
F3-1-5, CRD CHARGING WTR PRESSURE HI/LO
- CRD Pump 12 will not start
- 08:05: F3-2-5, CRD ACCUMULATOR LEVEL HIGH PRESS LOW, received for one accumulator.

Per N1-SOP-5.1, LOSS OF CRD, which one of the following is the LATEST TIME to insert a manual reactor scram?

- A. 08:05
- B. 08:10
- C. 08:20
- D. 08:25

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 25 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 25 |
| System ID: | 21025 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-201-1-01, EO-1.7 |

Answer: a. 08:05. With reactor pressure below 900 psig, (Cleanup HP control valve is placed in service at at 500 psig) a scram must be inserted immediately upon receipt of the first accumulator trouble alarm if no CRD pumps are running. Above 900 psig, 20 minutes are permitted from receipt of the first accumulator trouble alarm with no CRD pumps running until the scram is required

Distractor: b. Made up this time for balance and other SOP actions that are to be taken within 5 minutes

Distractor: c&d Considers 20 minute time which applies only if above 900 psig and the 20 minute time starts upon receipt of the first accumulator trouble alarm not the CRD pump loss.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 25 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295022 AA1.02 3.6/3.6 RPS
AA1.02 Ability to operate and/or monitor the following as they apply to LOSS OF CRD PUMPS: RPS

Question Source

- New

PROC

- N1-SOP-5.1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

26

SYSID: 21026

Points: 1.00

An unisolable steam leak has developed in the reactor building with a general area temperature reading 142° F. EOP-5 requires a scram to be inserted. Which one of the following identifies the correct EOP Bases for inserting the scram?

- A. Ensure reactor is shutdown prior to leak getting larger.
- B. Minimize the effects on Reactor Level Instrumentation.
- C. Rapidly lower the leak rate into the secondary containment.
- D. Reduce the heat input into the secondary containment.

Answer: D

Associated objective(s):

Development Area (FIO)

Question 26 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 26 |
| System ID: | 21026 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-05, EO-1.3 |

Answer: d. Reduce rate of heat input into the secondary containment.

Distractor: a. Ensure reactor is shutdown prior to leak getting larger. This has nothing to do with the bases for the actions

Distractor: b. Minimize the effects on Reactor Level Instrumentation. Level instruments are not affected by this leak and esp at this temperature

Distractor: c. Following a scram, the reactor would still be at pressure. The blowdown will reduce leak rate.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 26 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295032 EK3.02 3.6/3.8 Reactor SCRAM
Knowledge of the reasons for the following responses as they apply to HIGH SECONDARY
CONTAINMENT AREA TEMPERATURE: Reactor Scram

Question Source

- New

PROC

- N1-EOP-5 Rev. NA
- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

27

SYSID: 21087

Points: 1.00

The plant is at 80% power when a seismic event occurs. Subsequently, because of a torus water leak the following are observed:

- H2-2-1, R BLDG FL DR SUMPS 11-16 AREA WTR LVL LEVEL HIGH, in alarm
- Computer Pt. F188 NE RB CORNER RM WTR LVL HIGH in alarm

Which one of the following is the operability of the safety-related pumps in this area?

- A. Core Spray Pumps 121 and 122 are inoperable at this time.
- B. Core Spray Pumps 121 and 122 remain operable until level in this area rises an additional 2 feet.
- C. Containment Spray Pumps 112 and 122 are inoperable at this time.
- D. Containment Spray Pumps 112 and 122 remain operable until level in this area rises an additional 2 feet

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 27 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 27 REPLACEMENT FROM OLD SRO 12 |
| System ID: | 21087 |
| User ID: | . |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-05, EO-1.2 |

N1-ODP-PRO-03-5, element SC-05 through SC-08

Answer: c. Containment Spray Pumps 112 and 122 are in the NE corner room and are the components affected by the water level in the room. The alarm is actuated at a water level of 5 feet in the room, which is the maximum safe value. The max safe value is defined to be the highest value at which equipment necessary for the safe shutdown of the plant will operate. Therefore the components in the area are inoperable.

Distractor: a. Core Spray Pumps 121 and 122 are in the SE corner room and are not affected

Distractor: b. The maximum safe value is already reached. Therefore the components in the area are inoperable. Core Spray Pumps 121 and 122 are in the SE corner room and are not affected.

Distractor: d. The maximum safe value is already reached.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 27 Cross References (table item links)

10CFR55

- 41(b)(9)
- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295036 EA2.02 3.1/3.1 Water level in the affected area
295036 Secondary Containment High Sump/Area Water Level/5
EA2.02 Ability to determine and/or interpret the following as they apply to SECONDARY CONTAINMENT
HIGH SUMP/AREA WATER LEVEL:
Water level in the affected area

Question Source

- New

PROC

- N1-ODP-PRO-0305 Rev. NA
- N1-ARP-H2-2-1, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION



28

SYSID: 21028

Points: 1.00

The Shutdown Cooling System is being placed in service. The inboard isolation valve (38-01) is open however the Outboard Isolation valve (38-02) valve will NOT open.

Which one of the following is preventing valve 38-02 from opening?

- A. Reactor water level is 40".
- B. Reactor pressure is 125 psig. 
- C. 38-02 must be opened before 38-01.
- D. Reactor coolant temperature is 365° F. 

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 28 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 28 |
| System ID: | 21028 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-205-1-01, EO-1.4 |

| | |
|-------------|--|
| Answer: | b. Per OP-4 P&L. 38-01, and 38-02 are interlocked so that only one valve can be opened when Reactor Pressure is above 120 psig. Below 120 psig, both valves can be opened. |
| Distractor: | a. Reactor water level is 40". Low level isolation is 5" |
| Distractor: | c. 38-02 must be opened first – doesn't't matter which is open first, both cannot be open if pressure greater than 120 psig |
| Distractor: | d. Reactor coolant temperature is 365° F. AT 350° F the pump will trip however this has NO effect on position of valves. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 28 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 205000 K5.02 2.8/2.9 Valve operation
- 205000 K5.02 Knowledge of the operational implications of the following concepts as they apply to SDC:
Valve Operation

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

29

SYSID: 21214

Points: 1.00

Given the following conditions:

- RPV water level is being maintained in the HPCI mode and is stable
- Subsequently,
 - H3-4-6, FEEDWATER CONTROL SYSTEM TROUBLE alarms
 - W096 FW INST AC POWER TROUBLE alarms
 - The ONLY affected HPCI component is FCV 12

Assuming NO other variables affect the current RPV water level, which one of the following describes the effect of the control signal loss on RPV water level, if any, and the actions necessary for level control?

- A. RPV water level lowers.
Pin the FCV operator and position the FCV locally.
- B. RPV water level rises.
Disengage the motor-operator and position the FCV locally.
- C. RPV water level remains constant.
Pin the FCV operator and position the FCV locally.
- D. RPV water level remains constant.
Install the manual coupling fork to position the FCV locally.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 29 Details

| | |
|-------------------|------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 29 |
| System ID: | 21214 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | N1-OP-16, H.2.0, H.1.0 |

| | |
|-------------|---|
| Answer: | c. FCVs lock as-is so RPV water level is not affected. FCV is an air-operated valve so it must be pinned to operate it locally. FCV 13 may modulate closed 10% when the electrical signal is lost which makes a lowering RPV water level very plausible. |
| Distractor: | a. Level remains constant. FCV 13 (not 12) may modulate closed 10% when the electrical power is lost which makes a lowering RPV water level very plausible. |
| Distractor: | b. FCV 13 (not 12) position indicator (POI-29-134) may fail upscale due to loss of power to the positioner, however, actual valve position is unchanged as 13 FCV fails as-is. This makes a rising water level very plausible. Air-operated and not motor-operated. |
| Distractor: | d. This is the local action for FCV 13, not for FCV 12 which are different type valves/operators. |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 29 Cross References (table item links)

10CFR55

- 41(b)(7)
- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 206000 K2.01 3.2*/3.3* System valves: BWR-2,3,4
Knowledge of electrical power supplies to the following: system valves

Question Source

- New

PROC

- N1-OP-16 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

30

SYSID: 21030

Points: 1.00

Given the following conditions:

- Both emergency condensers have automatically initiated
- Reactor pressure is 1000 psig and dropping

Which one of the following describes how the operator controls the cool down rate per N1-OP-13, "Emergency Cooling System"? Unless directed by the SSS, the operator:

- A. Secures one EC system and maintains the cool down rate less than 75°F/hr.
- B. Secures one EC system and maintains the cool down rate less than 100°F/hr.
- C. Leaves both EC systems in service and maintains the cool down rate less than 75°F/hr.
- D. Leaves both EC systems in service and maintains the cool down rate less than 100°F/hr.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 30 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 30 |
| System ID: | 21030 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-207-1-01, EO-1.7 |

This is a duplicate of bank question SYSID 12360

Answer: a. Correct. Per N1-OP-13, H.1.5, one EC system is secured and procedural limit for cooldown rate is 75°F/hr.

Distractor: b. Incorrect. Cooldown rate of 100°F/hr would violate procedural limit.

Distractor: c. Incorrect. One EC is to be secured per the OP.

Distractor: d. Incorrect. Procedure direction is to maintain below 75°F/hr.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 30 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 207000 K5.09 3.7/4 Cooldown rate: BWR-2,3
K5.09 Knowledge of the operational implications of the following concepts as they apply to ISOLATION (EMERGENCY) CONDENSER: Cooldown rate: BWR-2,3.

Question Source

- Bank

PROC

- N1-OP-13 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

31

SYSID: 21031

Points: 1.00

EC 11 was in operation when a steam flow isolation occurred. For continued operation of EC11 following this isolation, the operator:

ASSUME AUTO INITIATED AND SIGNAL STILL PRESENT

- places EMERG COOLING CHANNEL 11 isolation bypass switch to BYPASS then back to NORM
- places 39-05, EMERG CNDSR RET ISOLATION VALVE 11, control switch to CLOSE

Which one of the following describes the additional action(s) required to establish circulation between EC11 and the reactor vessel?

- A. Place 39-05, EMERG CNDSR RET ISOLATION VALVE 11, control switch to open.
- B. Open 39-07R, EC STEAM ISOLATION VALVE 112, and 39-09R, EC STEAM ISOLATION VALVE 111.
- C. Return EMERG COOLING CHANNEL 11 isolation bypass switch back to BYPASS.
- D. Open 05-11, EMERG COND VENT ISOLATION VALVE 112, and 05-01R, EMERG COND VENT ISOLATION VALVE 111

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-207-1-01, EO-1.7

Answer:

b. During operation of the emergency cooling loops, steam rises from reactor vessel via piping to the condenser tubes where it gives up heat by boiling the condenser shell water at approximately 5 psig. After the steam condenses, it returns by gravity flow to the suction of a reactor recirculating pump and then to the reactor vessel. In the standby condition, the steam isolation valves are normally open so that the tube bundles are continuously at reactor pressure. **The system is placed into operation by opening the normally-closed condensate return isolation valve** which is DC & AC solenoid air-operated. In response to the isolation the following isolation valves close:

- 05-11, EMERG COND VENT ISOLATION VALVE 112
- 05-01R, EMERG COND VENT ISOLATION VALVE 111
- 39-11R, EMERG CONDSR STM SUPPLY DRAIN IV 111
- 39-12R, EMERG CONDSR STM SUPPLY DRAIN IV 112
- 39-07R, EC STM ISOLATION VALVE 112
- 39-09R, EC STM ISOLATION VALVE 111

• 39-05 EMERG CNDSR COND RET ISOLATION VALVE 11
EMERG COOLING CHANNEL 11
isolation bypass keylock switch is taken to BYPASS then back to NORM.

39-05 EMERG CNDSR COND RET ISOLATION VALVE 11 control switch is taken to CLOSE to reset the isolation signal, which automatically opens this valve and the following valves:

- 05-11, EMERG COND VENT ISOLATION VALVE 112
- 05-01R, EMERG COND VENT ISOLATION VALVE 111
- 39-11R, EMERG CONDSR STM SUPPLY DRAIN IV 111
- 39-12R, EMERG CONDSR STM SUPPLY DRAIN IV 112

Open 39-07R, EC STEAM ISOLATION VALVE 112, and 39-09R, EC STEAM ISOLATION VALVE 111, to return the

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 31 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 31 |
| System ID: | 21031 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

- Distractor: EC to service.
a. Place 39-05, EMERG CNDSR RET ISOLATION VALVE 11, control switch to open is not required. It auto opened when the control switch was taken to closed to reset the isolation signal. Also, steam isolation valves must be manually opened following an isolation signal to return the EC to service. In standby, the steam isolation valves are open and the action to place the EC in service is to open 39-05 EMERG CNDSR COND RET ISOLATION VALVE.
- Distractor: c. Return EMERG COOLING CHANNEL 11 isolation bypass switch back to BYPASS is not required. The operator action is correct. Also, steam isolation valves must be manually opened following an isolation signal to return the EC to service. In standby, the steam isolation valves are open and the action to place the EC in service is to open 39-05 EMERG CNDSR COND RET ISOLATION VALVE.
- Distractor: d. Open 05-11, EMERG COND VENT ISOLATION VALVE 112, and 05-01R, EMERG COND VENT ISOLATION VALVE 111 is not required since these valves auto opened, however, the EC is not in service until the steam isolation valves are open. In standby, the steam isolation valves are open and the action to place the EC in service is to open 39-05 EMERG CNDSR COND RET ISOLATION VALVE.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 31 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 207000 A1.03 3.3*5-Mar Steam flow: BWR-2,3
A1.03 Ability to predict and/or monitor changes in parameters associated with operating the ISOLATION (EMERGENCY) CONDENSER controls including:
Steam flow: BWR-2,3.

Question Source

- New

PROC

- N1-OP-13 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

32

SYSID: 21032

Points: 1.00

With the plant at 100% power, operability of the Core Spray System power-operated valves and pumps is required to be demonstrated quarterly.

Because of the design of the Core Spray System, which one of the following is the number of QUARTERLY SURVEILLANCE TESTS that are performed each quarter to demonstrate operability of all required Core Spray System power-operated valves and pumps?

- A. 1
- B. 2
- C. 4
- D. 8

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 32 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 32 |
| System ID: | 21032 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-209-1-01, EO-1.4 |

Answer: c. There are 4 separate quarterly STs (N1-ST-Q1A, Q1B, Q1C, Q1D) which are used to demonstrate operability of the Core Spray System power-operated valves and pumps – a separate test for each Core Spray Subsystem (111, 112, 121, 122) and its associated power-operated valves. This question matches the K/A because by system design there are two loops with two subsystems per loop, and the related valves within the system provide separation such that we can do 4 overlapping and independent tests.

Distractor: a. Many of the quarterly operability tests for other plant systems are contained within a single surveillance test making this a plausible distractor. However, CS uses 4 separate tests.

Distractor: b. Core Spray System has system 11 and system 12, therefore 2 is a plausible distractor considering that each system could be tested within a single surveillance test. However, CS uses 4 separate tests

Distractor: d. With four separate subsystems, separate tests could be developed for pumps and for valves for a total of eight surveillance tests which is plausible because of the complex design of the core spray system. However, Core Spray testing combines the pump and power-operated valve testing within one surveillance test.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 32 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 209001 K4.10 2.8/2.9 Testability of all operable components
K4.10 Knowledge of LOW PRESSURE CORE SPRAY SYSTEM design feature(s) which provide for the following: Testability of all operable components.

Question Source

- New

PROC

- N1-ST-Q1A Rev. NA
- N1-ST-Q1B Rev. na
- N1-ST-Q1C, Rev. NA
- N1-ST-Q1D, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

33

SYSID: 21033

Points: 1.00

The plant is at 100% power with Core Spray (CS) surveillance testing in progress. Current Core Spray valves alignment is as follows:

- 40-10, CORE SPRAY DISCHARGE IV 112 (inside) is closed
- 40-11, CORE SPRAY DISCHARGE IV 111 (inside) is closed
- 40-12, CORE SPRAY DISCHARGE IV 11 (outside) is closed
- 40-06, CORE SPRAY TEST VALVE 11 is open

Subsequently, a coolant leak occurs. Current event parameters are:

- Reactor water level is 20 inches
- Reactor pressure is 500 psig
- Drywell pressure is 8 psig

Considering the Core Spray valves identified above, which valve(s) will receive(s) a signal to reposition based on the current event parameters?

- A. 40-06
- B. 40-12
- C. 40-10, 40-11, 40-12
- D. 40-06, 40-10, 40-11

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 33 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 33 |
| System ID: | 21033 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-209-1-01, EO-1.4 |

Answer: a. Correct. On initiation of Core Spray with Drywell Pressure above 3.5 psig, test return valve 40-06 will close.

Distractor: b, c, &d. Incorrect. With RPV pressure at 500 psig, to Discharge IVs 40-10, 40-11 and 40-12 will not reposition (open) until RPV pressure drops below 365 psig.

References Provided: None

References C19859-c, Sheet 5 G-2, Sheet 9 A-2

Question 33 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

DRW

- C-19859-C,(RPS) Rev.

NUREG 1123 KA Catalog Rev. 2

- 209001 A1.08 3.3/3.2 System lineup
A1.08 Ability to predict and/or monitor changes in parameters associated with operating the LOW PRESSURE CORE SPRAY SYSTEM controls including: System lineup

Question Source

- Modified

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

34

SYSID: 21034

Points: 1.00

The following conditions exist:

- The plant has experienced an ATWS from 100% power
- All attempts to scram the reactor have failed
- The CSO is driving rods using RMCS
- Liquid Poison System 12 has been initiated

The following events then occur:

- **ALL** offsite power is lost
- EDG 103 fails to start
- No actions have been taken respecting the loss of offsite power

Given these conditions, which one of the following identifies the **QUICKEST METHOD** to restore boron injection?

- A. Restart Liquid Poison Pump 12.
- B. Manually start Liquid Poison Pump 11.
- C. Use reactor water cleanup to inject liquid poison.
- D. Use the hydro pump to inject liquid poison.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 34 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 34 |
| System ID: | 21034 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-211-1-01, EO-1.8 |

This question was developed using 17194 from Exam Bank

Answer: b. Manually inject with system 11 is **correct** - under these conditions, power is available to PB102 which provides power to LP#11. EDGs automatically power ECCS boards (102 & 103) on a LOOP therefore no operator action beyond placing the control switch in "SYS 11" is required to restore injection.

Distractor: a. EDG 103 failed to start causing a loss of PB103 and a loss of AC power to LP Pump 12.

Distractor: c & d. Alternate Boron Injection is **wrong** - Either method, using the hydro pump or RWCU, requires more time and resource than required to manually initiate SYS 11.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 34 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 211000 A2.03 3.2/3.4* A.C. power failures

Question Source

- Modified

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

35

SYSID: 21035

Points: 1.00

Following a failure to scram, the Liquid Poison (LP) System is started by placing the key lock selector switch to SYS 11. The following are observed for the LP System at the K Panel:

- System 11 explosive valve continuity light is OFF.
- System 12 explosive valve continuity light is OFF.
- Reactor Water Cleanup is isolated.
- Pump 11 started.
- Pump 11 discharge pressure is oscillating between 950 and 1000 psig.
- Tank level is NOT lowering.

Which one of the following actions is required and why?

- A. Start System 12 because System 11 is cycling back to the LP tank.
- B. Align the hydro pump for injection because the squibb valves did not fire.
- C. Continue injecting with System 11 because there is adequate flow to the Reactor.
- D. Align the Cleanup System for injection because liquid poison injection is blocked.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 35 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 35 |
| System ID: | 21035 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-211-1-01, EO-1.8 |

Answer: a. Start System 12 because System 11 is cycling back to LP tank. System 11 discharge relief valve is cycling allowing the LP pump discharge to return to the LP tank. Starting the N1-OP-12, requires starting the standby pump. LP pump 12 will bypass the #11 pump relief valve and permit the #12 system to supply boron.

Distractor: b. Aligning the hydro pump is available, but this requires time, additionally N1-OP-12 requires starting the standby pump.

Distractor: c. Adequate flow is not demonstrated because the LP tank level is not lowering.

Distractor: d. Aligning the cleanup system is an option, but this requires time, additionally N1-OP-12 requires starting the standby pump.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 35 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 211000 A4.08 4.2/4.2, Rev. NA
A4.08 Ability to manually operate and/or monitor in the control room: System initiation.

Question Source

- New

PROC

- N1-OP-12 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

36

SYSID: 21036

Points: 1.00

The plant is at 100% power, with the following:

- Group 1 Lights for RPS Channel 12 on Panels F and M are NOT LIT
- Group 1 light bulbs have been verified working
- All other group lights are LIT
- Then APRM Channel 16 fails upscale

Which one of the following identifies the required operator actions?

- A. Insert a manual scram and implement SOP-1.
- B. Confirm automatic scram and implement SOP-1.
- C. Bypass APRM 16 and reset RPS Channel 11.
- D. Bypass APRM 16 and reset RPS Channel 12.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 36 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 36 |
| System ID: | 21036 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-212-1-01, EO-1.4 |

Question derived from bank SYSID 12388

| | |
|-------------|--|
| Answer: | d. Correct. APRM 16 provides trip input into RPS Channel 12. With Group 1 RPS Channel 12 lights out, and APRM 16 above its trip setpoint, the result will be only a trip of RPS Channel 12. |
| Distractor: | a. Incorrect. Manual scram is not required. If the Group 1 lights were NOT LIT on Channel 11 and APRM 16 tripped Channel 12, then some rod motion will occur and a manual scram is required. |
| Distractor: | b. Incorrect. If Group 1 lights were NOT LIT on Channel 11 and Channel 12 trip, then rod motion may result in an automatic scram. |
| Distractor: | c. Incorrect. APRM 16 provides input into RPS Channel 12. RPS Channel 11 will not trip and does not require reset. |

References provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 36 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 212000 K1.01 3.7/3.9 Nuclear instrumentation
K1.01 Knowledge of the physical connections and/or cause-effect relationships between REACTOR PROTECTION SYSTEM and the following: Nuclear instrumentation.

Question Source

- Modified

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

37

SYSID: 21037

Points: 1.00

A plant startup is in progress, with the following:

- Reactor is critical with a heatup in progress
- IRM 16 detector is inadvertently selected for withdrawal.
- The FULL OUT pushbutton is depressed

Which one of the following describes the IRM 16 response and the effect on control rod withdrawal?

- A. Withdraws and a rod block occurs.
- B. **NOT** withdraw and a rod block occurs.
- C. Withdraws and control rod movement may continue.
- D. **NOT** withdraw but control rod movement may continue.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 37 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 37 |
| System ID: | 21037 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-215-1-02, EO-1.4 |

| | |
|-------------|--|
| Answer: | a. IRM 16 will withdrawal but a control rod block will be generated because the detectors are inserted with the Mode Switch in Startup. |
| Distractor: | b. There is no interlocked to prevent IRM withdrawal. |
| Distractor: | c. A control rod block will be generated because the detector is inserted with the Mode Switch in Startup. |
| Distractor: | d. There is no interlocked to prevent IRM withdrawal and control rod block will be generated because the detector is inserted with the Mode Switch in Startup. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 37 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 215003 K4.05 2.9/3 Changing detector position
K4.05 Knowledge of INTERMEDIATE RANGE MONITOR (IRM) SYSTEM design feature(s) and/or interlocks which provide for the following: Changing detector position.

Question Source

- New

PROC

- N1-OP-38B Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

38

SYSID: 21038

Points: 1.00

A reactor startup is in progress. The reactor is critical and a heatup is in progress. The following conditions exist:

- All IRMs are on Range 5
- SRM 11 now reads 70 cps
- SRM 12 now reads 175 cps
- SRM 13 now reads 250 cps
- SRM 14 now reads 140 cps
- Electrical power is lost to SRM 13 detector drive
- A control rod block exists

Which one of the following is required to clear the existing control rod block?

- A. Insert SRM 11.
- B. Withdraw SRM 11.
- C. Place SRM 13 in Bypass.
- D. Restore power to SRM 13.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 38 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 38 |
| System ID: | 21038 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-215-1-01, EO-1.4 |

| | |
|-------------|--|
| Answer: | a. Insert SRM 11 until greater the 100 cps or it's fully inserted. With the SRM fully inserted the downscale setpoint changes from 100 cps to 3 cps. |
| Distractor: | b. Withdrawing SRM 11 will result in an even lower SRM count rate. The rod block will not clear. |
| Distractor: | c. The loss of power to the detector drive does not cause a control rod block. Bypassing SRM 13 will not clear the rod block. |
| Distractor: | d. The loss of power to the detector drive does not cause a control rod block. Restoring power to SRM 13 will not clear the rod block. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 38 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 215004 A1.05 3.6/3.8 SCRAM, rod block, and period alarm trip setpoints
A1.05 Ability to predict and/or monitor changes in parameters associated with operating the SOURCE RANGE MONITOR (SRM) SYSTEM controls including:
SCRAM, rod block, period alarm trip setpoints.

Question Source

- New

PROC

- N1-OP-38A Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

39

SYSID: 21039

Points: 1.00

The plant is at 80% power in five (5) recirculation loop operation. The output of APRM Flow Unit 11 lowers to and remains at zero (0).

Which one of the following is the effect of this malfunction?

- A. Rod block. No ½ scram.
- B. Rod block and ½ scram.
- C. Just a flow unit downscale alarm.
- D. Just a flow unit inoperable alarm.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 39 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 39 |
| System ID: | 21039 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-215-1-02, EO-1.4 |

Answer: b. Correct. Flow Unit 11 output is used by RPS Channel 11 APRMS 11, 12, 13, 14. With flow signal of zero into these APRMs and power at 80% an APRM upscale trip occurs, resulting in a RPS Channel 11 trip and APRM upscale rodblock. Power is above the flow biased APRM upscale trip setpoint.

Distractor: a. Incorrect. RPS Channel 11 trips

Distractor: c. Incorrect. Additional actions do occur as a result of this downscale failure, such as the rod block and half scram from APRMs.

Distractor: d. Incorrect. Low flow is not an inop trip. If failure was caused by inop flow unit, the failure will still result in a half scram.

References Provided: None

C-19859-C, Sheet 5 G-2, Sheet 9 A-2

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 39 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

DRW

- C-19859-C,(RPS) Rev.

NUREG 1123 KA Catalog Rev. 2

- 215005 A3.05 3.3/3.3 Flow converter/comparator alarms
A3.05 Ability to monitor automatic operations of the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM including: Flow converter/comparator alarms.

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

40

SYSID: 21040

Points: 1.00

The plant is at 30% power, with the following:

- Four APRM 12 inputs, LPRMS 04-33C, 12-41A, 20-33A and 20-49A, are bypassed
- Both LPRM Downscale Buttons have been depressed
- LPRM 04-33A input to APRM 12 fails downscale, while buttons are still depressed

Which one of the following describes the condition of APRM 12?

APRM 12 is.....

- A. operable with a downscale trip generated.
- B. operable with an inop trip generated.
- C. inoperable with a downscale trip generated.
- D. inoperable with an inop trip generated.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 40 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 40 |
| System ID: | 21040 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-215-1-02, EO-1.4 |

Question created from Bank Question SYSID 12438

| | |
|-------------|--|
| Answer: | d. Correct. APRM 12 will generate an inop trip when LPRM 04-33A fails downscale because the count of available LPRMs has dropped below 4. The APRM must also be declared inoperable. |
| Distractor: | a&c. Incorrect. LPRM downscale will not generate an APRM downscale because the LPRM Downscale buttons are depressed. IF these were not depressed, a downscale trip would be generated. |
| Distractor: | b. Incorrect. APRM will generate an inop trip, but the instrument is inoperable. |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 40 Cross References (table item links)

10CFR55

- 41(b)(6)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.33 3.4/4 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications

Question Source

- Modified

PROC

- N1-OP-39 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

41

SYSID: 21041

Points: 1.00

The following conditions exist:

- A LOCA has occurred
- Drywell pressure 8 psig and rising slowly
- Annunciator MAIN STM LINE AUTOMATIC DE-PRESS TIMING alarmed
- Annunciator MAIN STM LINE ELECTROMATIC RELIEF VALVE OPEN alarmed
- Reactor water level is -15 inches and steady
- Reactor pressure is 200 psig and steady
- The Channel 11&12 ADS Reset pushbuttons are depressed

Which one of the following describes the expected response of the ADS ERVs following ADS reset pushbutton being depressed?

- A. Close and no further signal is received to open the valves.
- B. Close and reopen in 111 seconds.
- C. Remain open until reactor pressure < 50 psig.
- D. Close and reopen when the RESET pushbuttons are released.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 41 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 41 |
| System ID: | 21041 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: 01-OPS-001-218-1-01, EO-1.7 |

| | |
|-------------|---|
| Answer: | b. Resetting the ADS timers restarts the 111 second timers with pressure remaining in the RPV the valves would reopen in 111 seconds. |
| Distractor: | a. The ERVs will reopen because there is still RPV pressure and lo lo lo level. |
| Distractor: | c. The ERVs will close when the timer is reset because it interrupts the initiation circuit. |
| Distractor: | d The ERVs will close for 111 seconds when the timer is reset because it interrupts the initiation circuit and the timer must time out again. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 41 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.31 3.3/3.4 Knowledge of annunciators alarms and indications, and use of the response instructions
- 2.4.31 Knowledge of annunciators alarms and indications / and use of the response instructions.
- 218000 Automatic Depressurization System

Question Source

- New

PROC

- N1-ARP-F2 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

42

SYSID: 21042

Points: 1.00

The plant is inerting the Drywell per N1-OP-9, Section E.4.

Which one of the following will occur if plant conditions cause annunciator H1-1-8, STACK GAS MONITORING HIGH RADIATION to alarm?

- A. Only 201.2-624 and 201-40 close.
- B. Only 201-09, 10, 31 and 32 close.
- C. Only 201-09, 10, 31, 32 and 40 close.
- D. Only 201.2-624, 09, 10, 31 and 32 close.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 42 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 42 |
| System ID: | 21042 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-223-1-04, EO-1.4 |

Answer: b. Only 201-09, 10, 31 and 32 close. 201.2-624 which supplies N2 from the vaporizer does not close. 201-40 is a manual block valve and does not close.

Distractor: a. 201.2-624 which supplies N2 from the vaporizer does not close. 201-40 is a manual block valve and does not close.

Distractor: c. 201-40 is a manual block valve and does not close.

Distractor: d. 201.2-624 which supplies N2 from the vaporizer does not close.

References Provided: C-18014-C, Sheet 1 & 4

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 42 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 223002 A1.02 3.7/3.7 Valve closures
A1.02 Ability to predict and/or monitor changes in parameters associated with operating the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF controls including: Valve closures.

Question Source

- New

PROC

- N1-ARP-H1 Rev. NA
- N1-OP-09 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

43

SYSID: 21043

Points: 1.00

The plant is operating at 95% power with the following conditions:

- Both GREEN and RED lights for ERV111 position indication are extinguished
- On "M" Panel, the white test lights for ERV121 are extinguished
- Blue lights are illuminated
- All affected lamps and fuses have been verified good

All other plant indications are normal, no alarms are present

Given these conditions, which one of the following describes the **automatic** capabilities of ERV111 and ERV121?

- A. Both ERV111 and ERV121 will function as designed for ADS and pressure relief.
- B. Neither ERV111 or ERV121 will function as designed for ADS or pressure relief.
- C. ERV111 will function as designed for pressure relief and ADS; ERV121 will only function as a pressure relief.
- D. ERV121 will function as designed for ADS and pressure relief; ERV111 will only function if manually operated.

Answer: C

Associated objective(s):

Development Area (FIO)

Question 43 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 43 |
| System ID: | 21043 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-239-1-01, EO-1.4 |

Question derived from bank 17210

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 43 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 239002 K1.08 4.0*/4.1 Automatic depressurization system
K1.08 Knowledge of the physical connections and/or cause-effect relationships between RELIEF/SAFETY VALVES and the following: Automatic depressurization system.

Question Source

- Bank

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

44

SYSID: 21223

Points: 1.00

The following plant conditions exist:

- N1-ST-C2, Solenoid Actuated Pressure Relief Valves Operability and Flow Verification Test is in progress
- The last ERV to be tested was ERV 123
- ERV 123 Tailpipe Temperature Monitoring using computer point D371:
 - T= 5 minutes 324°F
 - T= 10 minutes 319°F
 - T= 15 minutes 314°F
 - T= 20 minutes 308°F
 - T= 25 minutes 302°F

Which one of the following is the operational implication of the above conditions?

- A. Abort the startup and perform a plant shutdown per N1-OP-43C.
- B. Abort the startup and immediately scram the reactor and enter N1-SOP-1.
- C. Place the startup on hold until an engineering evaluation and contingency plan are complete.
- D. Continue the startup and ensure the temperature eventually stabilizes below 200°F.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 44 Details

| | |
|-------------------|---------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 2nd REPLACEMENT 44 |
| System ID: | 21223 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | N1-OP-1; H.17.0, H.19.0 |

Answer: d. The indications represent the ERV is closed. After cycling an ERV, the tailpipe temperature will be approximately 330°F, and if the valve is not leaking the tailpipe temperature should reach equilibrium with the drywell, however, the return to a normal tailpipe temperature will be slow (several hours). With this trend there is no reason to believe the ERV is not closed.

Distractor: a. With an inoperable ERV, a rapid shutdown is required to achieve the target plant conditions specified in Tech Specs. There is no indication that this ERV is inoperable.

Distractor: b. ERV123 is not open or stuck open. If open a scram is required before torus water temperature reaches 110°F. Also, if an ERV vacuum breaker was cycling or believed to be cycling with indications of a leaking ERV the startup would be aborted. If the startup were required to be aborted then a scram would be inserted.

Distractor: c. This is a requirement if the ERV is leaking, has been cycled 3 times, and continues to leak.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 44 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 239002 K5.04 3.3/3.5 Knowledge of the operational implications of the following concepts as they apply to safety/relief valves: Tail pipe temperature monitoring

Question Source

- New

PROC

- N1-OP-01 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

45

SYSID: 21045

Points: 1.00

The plant is at 100% power. The Feedwater Level Control System is maintaining RPV water level at the desired reactor water level in three-element control.

The total main steam flow output to the steam flow-feed flow comparator goes to ZERO and remains at zero.

Which one of the following describes the direction and magnitude of the RPV water level change?

- A. **Lowers** and the reactor scrams on low level.
- B. **Lowers** but power operation continues. No reactor scram occurs.
- C. **Rises** and the turbine trips resulting in a reactor scram.
- D. **Rises** but power operation continues. No reactor scram occurs.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 45 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 45 |
| System ID: | 21045 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-259-1-02, EO-1.8 |

Answer: a. With a lower steam flow, the FWLC system senses less a lower demand in FW flow to maintain RPV water level and level lowers. Because of the failure of the total steam flow output signal to zero, the magnitude of the RPV level change demanded is approximately 40 inches. Level will lower below the low level scram setpoint

Distractor: b. The magnitude of the signal error will cause a reduction in FW flow such that level lowers below the low level scram setpoint.

Distractor: c. If the steam flow signal output signal increases, then the resulting RPV level will increase. However, with the steam flow output failed high, the magnitude of the level change would not cause a turbine trip.

Distractor: d. If the steam flow signal output signal increases, then the resulting RPV level will increase

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 45 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 259002 K6.03 3.1/3.1 Main steam flow input
K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the REACTOR WATER LEVEL CONTROL SYSTEM: Main steam flow input.

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

46

SYSID: 21219

Points: 1.00

The plant is shutdown preparing for a refueling outage. Conditions are:

- SDC 11 is in operation
- Reactor Recirculation Pumps 14 and 15 are operating
- All other Reactor Recirculation Loops are isolated
- Subsequently, PB12 deenergizes

Which one of the following are the correct plant conditions in response to the above conditions including why the conditions are established?

RPV water level is at:

- A. +100 inches (narrow range); RRP 15 suction valve closed; to avoid flow oscillations within the reactor core.
- B. +100 inches (narrow range); RRP 14 and 15 discharge and discharge bypass valves closed; to avoid inadequate mixing of cold water entering the reactor.
- C. +14 feet (wide range); RRP 14 and 15 suction valves closed; to avoid inadequate mixing of cold water entering the reactor.
- D. +14 feet (wide range); RRP 15 discharge and discharge bypass valves closed; to avoid flow oscillations within the reactor core.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 46 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 46 |
| System ID: | 21219 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-OP-4, Sections D.8.0, D.14.0
C-35843-C

Answer:

c. For this power loss, both of the operating reactor recirc pumps trip. Therefore, per N1-OP-4, D.8.0, Precautions and Limitations, to prevent thermal stratification while shutdown with fuel in the reactor vessel, forced circulation through the reactor core shall be maintained with at least one recirc pump running **OR** vessel level shall be maintained above the main steam line nozzles with the SDC system in service **AND** all recirc pump suction or discharge and discharge bypass valves closed. Thermal stratification is avoided by ensuring adequate circulation and resultant adequate mixing of cold water entering the reactor.

Per drawing C-35843-C, Reactor Vessel Instrumentation Level Ranges, the top of the main steam line nozzles is approximately 13.8 feet one the wide range GEMAC. The level presented of +14 feet is above this level and above the main steam line nozzles. The other level presented (+100 inches narrow range) is at the top of the steam separator and not above the main steam line nozzles.

Additionally, Per N1-OP-4, D.14.0, Precautions and Limitations, during shutdown cooling operation flow oscillations may occur when #14 RRP is running and #15 RRP is shutdown or if #15 RRP is running and #14 RRP is shutdown. In only one of the two pumps tripped, then flow oscillations could be a concern and not adequate mixing of cold water making making this event plausible. For this power loss both recirc pumps trip.

Distractor:

a. Incorrect reactor water level; this level is not above the MSL nozzles. Both recirc pumps tripped, not just one. If only one recirc pump tripped then this would be an appropriate level, appropriate action, and appropriate cause.

Distractor:

b. This is the correct action for the loss of both recirc pumps and the correct event to be mitigated, however, the

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Distractor: reactor water level is approximately 6 feet too low to ensure adequate mixing of cold water.
d. This is the incorrect action and the incorrect event to be mitigated. Both recirc pumps tripped, not just one. If only one recirc pump tripped then this would be an appropriate action and appropriate cause but would be the incorrect reactor water level for only one pump trip.

References Provided: NONE

Question 46 Cross References (table item links)

10CFR55

- 41(b)(5)
- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

DRW

- C-35843-C Rev. NA

NUREG 1123 KA Catalog Rev. 2

- G2.1.32 3.4/3.8 Ability to explain and apply system limits and precautions
- 205000 Shutdown Cooling

Question Source

- New

PROC

- N1-OP-4 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

47

SYSID: 21047

Points: 1.00

N1-OP-9, H.1.0, Venting Primary Containment Through RBEVS During Normal Ops, is in progress venting the torus using RBEVS #11. RBEVS Fan #11 trips.

Which one of the following describes the effect of the fan trip and the action in response to this effect?

- A. RBEVS train isolates but primary containment and secondary containment remain in communication until valves are manually closed by the control room operator.
- B. RBEVS train isolates and primary containment to secondary containment communication is interrupted by automatic valve closures.
- C. RBEVS train is unisolated until valves are manually closed but primary containment to secondary containment communication is interrupted by automatic valve closures.
- D. RBEVS train is unisolated and primary containment and secondary containment remain in communication until valves are manually closed by the control room operator.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 47 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 47 |
| System ID: | 21047 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-261-1-01, EO-1.8 |

Answer: d. correct. The only interlock is between the inlet and cooling dampers. Fan trip will not close any dampers.

Distractors: a, b, c. incorrect. The purge valves will not close automatically because no containment isolation or hi hi stack radiation signal is present.

References Provided: NONE

Question 47 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 261000 A2.05 3/3.1 Fan trips
A2.05 Ability to (a) predict the impacts of the following on the STANDBY GAS TREATMENT SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Fan trips.

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

48

SYSID: 21048

Points: 1.00

The plant is at 100% power with Motor-Operated Disconnect (MOD) 8106 between South Oswego No. 1 and NMP-Fitzpatrick No. 4 open. Because of a transient the operators insert a manual reactor scram.

Which one of the following describes the AC Distribution System response if the R40 breaker trips and WILL NOT close?

- A. EDG 102 powers PB 102. Fast transfer powers PB 12 from Transformer T101S.
- B. EDG 103 powers PB 103. Fast transfer powers PB 11 from Transformer T101N.
- C. EDG 102 and EDG 103 power PB 102 and PB 103. All other AC busses are de-energized.
- D. EDG 102 and EDG 103 are off. R10 is closed to power PB 11 and PB 12. PB 101 is de-energized.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 48 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 48 |
| System ID: | 21048 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-264-1-01, EO-1.4 |

| | |
|-------------|--|
| Answer: | b. |
| Distractor: | a. EDG 102 does not start. EDG 103 starts to power PB 103. PB 12 is deenergized. |
| Distractor: | c. PB 11 is powered by R10. Only EDG 103 starts to power PB 103. |
| Distractor: | d. R10 will power PB 11 but not PB12. EDG 103 starts to power PB 103. |

References Provided: NONE

Question 48 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 262001 K1.01 3.8/4.3* Emergency generators (diesel/jet)
Knowledge of the physical connections and/or cause-effect relationships between A.C. ELECTRICAL DISTRIBUTION and the following: Emergency generators (diesel/jet)

Question Source

- Bank

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

49

SYSID: 21049

Points: 1.00

A fault occurs within UPS 172 causing the inverter output voltage to lower to 105 volts.

Which one of the following actions is required?

- A. Confirm loads are powered from I&C Bus 130A with no operator action taken.
- B. Manually transfer UPS 172 loads to BYPASS TO LOAD per the operating procedure.
- C. Confirm loads are aligned to the BYPASS transformer with no operator action taken.
- D. Close the MAINTENANCE bus supply breaker then open the NORMAL supply breaker for the maintenance bus.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 49 Details

| | |
|-------------------|---------------------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 49 |
| System ID: | 21049 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OP-001-262-1-03, EO-1.8 |

Answer: c. Each UPS contains a static switch that will automatically transfer loads to a bypass power source in the event of either UPS failure or a downstream fault. The bypass power source is obtained from the same 600 VAC power panel as the UPS. Bypass power is conditioned by a step-down transformer with no load taps which permits manual compensation for large variations in source voltage.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 49 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 262002 A2.01 2.6/2.8 Under voltage
A2.01 Ability to (a) predict the impacts of the following on the UNINTERRUPTABLE POWER SUPPLY (A.C./D.C.); and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Under voltage.

Question Source

- New

PROC

- N1-OP-40 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

50

SYSID: 21050

Points: 1.00

Following a loss of Battery Board 11, which one of the following loads affected by the power loss can be returned to operation after aligning alternate 125 VDC power to Battery Board 12?

- A. All functions of ERV 111, 112, and 113 are restored.
- B. All functions of PB 101 breakers R1011 and R1014.
- C. EDG 102 except breaker R1022 must be manually closed.
- D. Motor Driven Fire Pump except its auto start remains defeated.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 50 Details

Question Type: Multiple Choice
Topic: NRC RO 50
System ID: 21050
User ID:
Status: Active
Must Appear: No
Difficulty: 0.00
Time to Complete: 0
Point Value: 1.00
Cross Reference: LC1 03-01
User Text:
User Number 1: 0.00
User Number 2: 0.00
Comment: Objective: O1-OPS-001-263-1-01, EO-1.8

Answer: c. EDG 102 125 VDC control power is lost.
Transfer to alternate 125 VDC supply for EDG102 per N1-OP-45 Sec. H.

- 3.0 EDG Alternate 125 VDC Feeds
- 3.1 To supply alternate 125 VDC feed to EDG 102, perform the following:
- 3.1.1 Manually close DC ISOLATION BKR. CAB. 103 -
BATT 12 TO 102 DG (DG 103 RM) ()
- 3.1.2 Select to BATT 12, UNIT-SEL. SW. (DG 102
Control Cab) ()
- 3.1.3 IF EDG start and loading is desired in this
configuration,
THEN local manual closure of R1022 DG 102 OUTPUT
BKR is required ()

Distractor: a. The following functions for ERV 111, 112 & 113 are NOT operable:
• F Panel controls
• Auto Pressure Relief
• ADS

Distractor: b. Powered from BB12 and are not affected.

Distractor: d. Diesel Fire Pump control circuits are DC powered, not the MDFP. MDFP is not affected by BB11 loss. Indicating auto start feature remaining inoperable is similar to the actual affected control circuits of the DFP.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 50 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 263000 K2.01 3.1/3.4 Major DC loads, Rev. NA
K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads

Question Source

- New

PROC

- N1-OP-47A Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

51

SYSID: 21220

Points: 1.00

Given the following conditions:

- Drywell pressure is 14 psig and lowering
- RPV water level is -99 inches and lowering slowly
- Reactor Pressure is 400 psig and lowering
- Containment Spray Pumps 112 and 122 manually started for containment spray
- Containment Spray Pumps 111 and 121 are the required position for these conditions

A loss of offsite power occurs. Ten (10) seconds following the loss of offsite power, Annunciator A5-3-3 DSL. GEN. 103 LOCKOUT 86D6-3 is received.

Assuming **NO** operator actions, which one of the following describes the Containment Spray and Core Spray status one (1) minute after the power loss?

- A. Containment spray flow is unaffected, Core Spray flow is 3400 GPM.
- B. Containment spray flow is unaffected, Core Spray flow is 6800 GPM.
- C. Containment spray flow is reduced, Core Spray flow is 3400 GPM.
- D. Containment spray flow is reduced, Core Spray flow is 6800 GPM.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 51 Details

| | |
|-------------------|---------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 51 |
| System ID: | 21220 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | N1-OP-30, H.38.0, 38.1.5. |

Answer: d. Containment Spray Pump 112 will restart 30 seconds after EDG102 powers PB102. Containment Spray Pump 122 will not start since it is powered from PB103 which is supplied by EDG103 which cannot power the bus.

Two core spray loops will be injecting at approximately 6800 GPM through a combination of one full open valve and one partially open valve in each loop.

Distractor: a. see justification above
Distractor: b. see justification above
Distractor: c. see justification above

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 51 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 264000 K3.03 4.1*/4.2* Major loads powered from electrical buses fed by the emergency generator(s)
K3.03 Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following: Major loads powered from electrical buses fed by the emergency generator(s).

Question Source

- New

PROC

- N1-OP-30 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

52

SYSID: 21052

Points: 1.00

The plant is at 100% power with the following:

- Instrument Air Compressor (IAC) #13 in service
- IAC #12 in pull-to-lock
- Instrument Air Dryer (IAD) 94-168 in service
- Subsequently, IAC #11 trips (lost control power) and its control switch is placed in pull-to-lock
- The ASSS directs bypass of IAD 94-168 and IAD 94-169

Per N1-OP-20, which one of the following actions is required until either IAC #11 or IAC #12 is returned to service?

- A. Start IAD 94-169 and then close the bypass valves.
- B. Blow down designated air manifolds once every 24 hours.
- C. Align the temporary service air compressor to the instrument air system.
- D. Align service air to the reactor building track bay roll door (D-39) inflatable seal.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 52 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 52 |
| System ID: | 21052 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-278-1-01, EO-1.8

N1-OP-20, D.4.0, H.3.0 step 3.6

Answer: b. Per N1-OP-20; D.4.0: Any combination of pulling control power fuses AND/OR placing Control Switches to Pull To Lock for both Instrument Air Compressors 11 AND 12 will result in a Loss of Control Power to the Instrument Air Dryers 94-168 and 94-169, resulting in a shutdown of the Instrument Air Dryers. Per N1-OP-20, Section H.3.0, step 3.6, blow down designated air manifolds daily until air dryers are restored.

Distractor: a. Per N1-OP-20; D.4.0: Any combination of pulling control power fuses AND/OR placing Control Switches to Pull To Lock for both Instrument Air Compressors 11 AND 12 will result in a Loss of Control Power to the Instrument Air Dryers 94-168 and 94-169, resulting in a shutdown of the Instrument Air Dryers. Neither IAC can be started at this time.

Distractor: c. The Temporary Service Air Compressor is not an acceptable alternate supply to the Instrument Air System. The temporary air compressor is used during outages for service air augmentation.

Distractor: d. Per N1-OP-20; H.17.0 note: The Reactor Building Track Bay Roll Door (D-39) inflatable seal is pressurized from the Instrument Air System and cannot be considered operable with IAC 11 and IAC 12 removed from service. Therefore, failure to maintain the Rx Bldg Outer Swing Door (D-198) closed and sealed while IAC 11 and IAC 12 are removed from service will result in violation of secondary containment integrity.
Per N1-OP-20; H.17.0, Step 17.4: If secondary containment integrity is required, THEN verify the following: (1) Rx Bldg Outer Swing Door (D-198) is closed and sealed, and (2) Clearance section placed on Rx Bldg Outer Swing Door (D-198) in the closed and sealed position.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 52 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 300000 A2.01 2.9/2.8 Air dryer and filter malfunctions
A2.01 Ability to (a) predict the impacts of the following on the INSTRUMENT AIR SYSTEM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: Air dryer and filter malfunctions.

Question Source

- New

PROC

- N1-OP-20 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

53

SYSID: 21215

Points: 1.00

The plant has been operating at 100% power for 75 days when the following are observed:

- H1-4-1, R BUILDING COOLING WATER PRESS TEMP MAKEUP FLOW, alarms
- Computer Point B110, RB COOL WTR LOOP MU FLOW HIGH (FS-70-39) alarms
- Operator dispatched to investigate reports that the RBCLC High Point Vent Overflow is leaking a steady stream of water
- RBCLC pressure in the Control Room, PI-70-17A, is 126 psig and steady

Which one of the following is the source of the leakage and the correct action in response to the above conditions?

- A. Leak from the Reactor Recirc Pump and Motor Coolers.
Commence a 10-hour shutdown.
- B. Leak from the Reactor Recirc Pump and Motor Coolers.
Immediately scram the reactor and trip all Recirc Pumps.
- C. Leak from the Reactor Water Cleanup System.
Rapidly isolate Cleanup and commence a 10-hour shutdown.
- D. Leak from the Reactor Water Cleanup System.
Immediately scram the reactor and then trip all Cleanup Pumps.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 53 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 53 |
| System ID: | 21215 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-OP-11, Section H.15.0 and H.16.0
N1-ARP-H1 H1-4-1

Answer:

c. Per ARP H1-4-1, with flow from the vent then initiate N1-OP-11 abnormal for RBCLC internal system leakage. Leakage into the RBCLC System with the system in operation will be from a higher pressure source such as Recirculation Pump Seal Coolers and Cleanup Non Regenerative Heat Exchanger. Cleanup NRHX and Reactor Recirc coolers are the leaks identified in the question that have ample pressure to cause in-leakage to the RBCLC system and cause leakage at the elevated drain in the turbine building.

When flow is detected at the RBCLC High Point Vent overflow, monitor RBCLC pressure in the Control Room, PI-70-17A. If flow is detected at the funnel AND flowrate is > 10 gpm (flow switch FS-70-39 activated which is the cause of the alarm), then commence a 10 hour shutdown per N1-OP-43C. If pressure indicated on PI-70-17A reaches 125 psig, then perform rapid Reactor Water Cleanup System isolation AND depressurization per N1-OP-3.

Distractor:

a. leak from RR pump and motor coolers will not cause the RBCLC system pressure increase observed on the control room indicator. For the conditions presented a rapid cleanup system isolation and 10-hour shutdown are required.

Distractor:

b. The actions presented are the correct actions if the RR pump and motor coolers were the correct source of the leakage. However, although the actions are correct if this were the source of the leakage, a leak from RR pump and motor coolers will not cause the RBCLC system pressure increase observed on the control room indicator. For the conditions presented a rapid cleanup system isolation and 10-hour shutdown are required.

Distractor:

d. The actions presented are those related to the required actions if the source of leakage is from the RR pump and motor coolers and not cleanup.

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

However, since cleanup is the source, a rapid isolation of the cleanup system is required and a 10-hour shutdown is required, not a reactor scram.

References Provided: NONE

Question 53 Cross References (table item links)

10CFR55

- 41(b)(3)
- 41(b)(10)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 400000 K1.04 2.9/3.1 Component Cooling Water System, Knowledge of the physical connections and/or cause-effect relationships between CCWS and the following: Reactor coolant system, in order to determine source(s) of RCS leakage into CCWS

Question Source

- New

PROC

- N1-ARP-H1 Rev. NA
- N1-OP-11 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

54

SYSID: 21054

Points: 1.00

A reactor startup is in progress, with the following:

- IRMs have been placed on Range 7
- Annunciator F3-1-5, CRD CHARGING WTR HEADER PRESSURE HI/LO has been received
- RD19, Charging Header Pressure on F panel indicates 1550 psig
- A reactor scram occurs

Which one of the following describes the effect of this condition on control rod drive mechanisms?

- A. Slower than design insertion speed.
- B. Faster than design insertion speed.
- C. May result in damage to collet fingers.
- D. May result in damage to index tube.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 54 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 54 |
| System ID: | 21054 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-201-1-01, EO-1.8

This question was derived from bank SYSID 16223

EO-1.6

EO-1.8

Answer:

d. The student must recognize that under the conditions presented, lower than rated RPV pressure exists. Per N1-OP-5, a scram with elevated charging header pressure (above 1510 psig) when the reactor is not at rated conditions may result in damage to the mechanism index tube. This damage is due to the excessive differential pressure across the tube and not the velocity (speed) of the rod during insertion. This question requires the student to recall the basis for the CRD Charging Water Header pressure upper limitations after discerning the applicable conditions for the precaution.

Distractor:

a. **"...slower scram insertion speed..."** is incorrect. This is a concern only if RPV pressure is less than 800 psig and a complete loss of all accumulator pressure is experienced. The normal pressure required for the HCU accumulators prevents this.

Distractor:

b. **"...faster scram insertion speed..."** is incorrect. Higher pressures (1600 psig charging header with 0 psig RPV) have resulted in deformation of the index tube when control rods have short withdrawal (12 inches) but do not appreciably affect the scram velocity (testing has been done at velocities up to 100 inches per second).

Distractor:

c. **"...collect finger damage..."** is incorrect. As stated above. Selection of this answer indicates the student is unfamiliar with the components of the mechanism and the basis for limits and alarm response actions.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 54 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 201001 K3.03 3.1/3.2 Control rod drive mechanisms
K3.03 Knowledge of the effect that a loss or malfunction of the CONTROL ROD DRIVE HYDRAULIC SYSTEM will have on following: control rod drive mechanisms.

Question Source

- Bank

PROC

- N1-ARP-F3 Rev. NA
- N1-OP-05 Rev. NA
- N1-ICP-A-44, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

55

SYSID: 21055

Points: 1.00

The operator is performing N1-ST-V3, RWM Operability Test, Section 8.4, RWM Rod Block Test, in preparation for reactor startup. An "out of sequence" control rod is selected (SELECT ERROR light ON) and withdrawn to position 04. The following alarms are received:

- WITHDRAW BLOCK light ON at RWM Display Panel
- ROD WORTH MINIMIZER light ON at Rod Block Monitor Display Panel
- F3-4-4, ROD BLOCK in alarm

Which one of the following describes the operation of the RWM?

- A. Rod block alarms are an accurate representation of correct operation.
- B. Rod block alarms should have been received when the rod was selected.
- C. Rod block alarms should have been received when attempting to withdraw this control rod from position 00.
- D. Rod block alarms should not be received until attempting to withdraw this control rod to position 06.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 55 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 55 |
| System ID: | 21055 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-201-1-03, EO-1.7 |

Answer:

- a. 8.4 RWM Rod Block Test
- 8.4.1 Select an "out of sequence" Rod at position 00 as designated by Reactor Engineering AND record Rod Selected.
- 8.4.2 Confirm SELECT ERROR light ON at Rod Worth Minimizer Display Panel.
- 8.4.3 Using CONTROL ROD MOVEMENT Switch in ROD OUT NOTCH mode, withdraw designate Control Rod to "04" position. 8.4.4 Verify Rod motion to position 04.
- 8.4.5 Using CONTROL ROD MOVEMENT Switch in ROD OUT NOTCH [T/S] mode, attempt to withdraw designated Control Rod to "06" position AND confirm Rod motion is blocked beyond position "04" is blocked.
- 8.4.6 Confirm the following indications ON: (T/S)
 - a. WITHDRAW BLOCK light ON at RWM Display Panel.
 - b. ROD WORTH MINIMIZER light ON at Rod Block Monitor Display Panel.
 - c. Annunciator F3-4-4, ROD BLOCK - ON.

Distractor: b. c. d. See justification above.

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 55 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 201006 A3.03 3.1/3 Annunciator and alarm signals: P-Spec(Not-BWR6)
A3.03 Ability to monitor automatic operations of the ROD WORTH MINIMIZER SYSTEM (RWM)
including:
Annunciator and alarm signals.

Question Source

- New

PROC

- N1-ST-V3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

56

SYSID: 21216

Points: 1.00

With the plant at 100% power, intake structure clogging occurs due to frazzle ice. When the reactor was scrammed at 22.4 inches hg main condenser vacuum, many control rods failed to insert. Current conditions are:

- RPV level deliberately lowered (currently +40 inches indicated)
- Reactor power is steady at 15%
- Main condenser vacuum is 15 inches hg degrading at 3 inches hg per minute

Which one of the following actions is required AT THIS TIME based on the above conditions?

- A. Initiate boron injection.
- B. Trip the recirculation pumps.
- C. Initiate the Emergency Condensers.
- D. Lower RPV water level to -84 inches.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 56 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO IMPROVEMENT 56 |
| System ID: | 21216 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | N1-EOP-3 |

Answer: b. Trip the recirculation pumps because the turbine has tripped on low vacuum and RPV water level is still above the automatic trip set point for the RR Pumps.

Distractor: a. Boron injection is not required at this time because power is NOT oscillating and there is no heat input to the torus. The TBV are still controlling reactor pressure and will continue to function until they automatically close in response to the lowering vacuum in about 2 minutes. Two additional minutes of lowering RPV water before the BPVs close could substantially reduce reactor power so boron initiation is not appropriate at this time.

Distractor: c. No ERVs are cycling therefore the ECs are NOT required at this time.

Distractor: d. RPV water level should be lowered to -41 inches NOT -84 inches and then evaluated prior to continuing to lower level to TAF (-84 inches) because the ERVs are closed and two additional minutes of lowering RPV water before the BPVs close could substantially reduce reactor power. Resulting in re-establishing injection rather than continuing to lower it.

References Provided: EOP-3

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 56 Cross References (table item links)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.6 3.1/4 Knowledge symptom based EOP mitigation strategies
- 202002 Recirc Flow Control

Question Source

- New

PROC

- N1-EOP-03 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

57

SYSID: 21057

Points: 1.00

During a control rod sequence exchange at power, the first control rod to be repositioned is at position 08 and will be single notch withdrawn to position 48. This control rod is successfully withdrawn to position 10 but when withdrawn to position 12, the Rod Position Indication (RPI) for this control rod is blank.

Per N1-OP-5, Control Rod Drive System, abnormal for Loss of RPI, which one of the following actions is required to proceed?

- A. Insert this control rod one notch and confirm rod position by observing proper RPI for position 10.
- B. Declare this control rod inoperable and without delay fully insert this control rod and then disarm and isolate its' HCU
- C. Return this control rod to its original position 08 and request Reactor Engineering modify the control rod sequence exchange.
- D. Insert this control to rod full in and confirm rod position by observing the green full in light is on.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 57 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 57 |
| System ID: | 21057 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-201-1-01, EO-1.7 |

| | |
|-------------|--|
| Answer: | a. If the control rod is inserted one notch and position can be determined, then control rod withdrawal can proceed |
| Distractor: | b. This is the required action if the position indication is lost for more than one position. This has not occurred – only one position indication is lost |
| Distractor: | c. The control rod sequence exchange can proceed without any modifications. An appropriate action for any abnormal condition is to place the component in a safe condition. Inserting this control rod back to position 08 would occur without any procedural guidance which is not appropriate. |
| Distractor: | d. Numerous control rod failures require that the affected control rod be fully inserted. This is an incorrect application of this procedure to the loss of RPI actions. It is only necessary to insert the control rod one notch to confirm its position. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 57 Cross References (table item links)

10CFR55

- 41(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 214000 A2.01 3.1/3.3 Failed reed switches
A2.01 Ability to (a) predict the impacts of the following on the ROD POSITION INFORMATION SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Failed reed switches.

Question Source

- New

PROC

- N1-OP-5 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

58

SYSID: 21058

Points: 1.00

With EC 11 aligned for standby per the operating procedure, which one of the following conditions will automatically initiate EC 11 and EC 12?

- A. Steam leak in the drywell estimated at 342 gpm.
- B. Coolant leak in the drywell estimated at 342 gpm.
- C. RPV water level is deliberately lowered during an ATWS.
- D. RPV pressure is controlled by bypass valves during an ATWS.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 58 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 58 |
| System ID: | 21058 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-207-1-01, EO-1.4

Answer:

c. Automatic operation of the emergency cooling system is initiated by high reactor pressure, in excess of 1080 psig, sustained for 12 seconds. To assist in depressurization for small breaks, the system is initiated on low-reactor water level (+5 inches) sustained for 12 seconds. If reactor water level is deliberately lowered during an ATWS, it is lowered to at least -41 inches. This satisfies the conditions for EC initiation on lo-lo level.

Distractor:

a. High reactor pressure is not challenged, but rather lowers in response to the leak. Reactor water level remains above the lo-lo set point if within the capability of HPCI. During a loss of coolant accident, high drywell pressure due to a line break would cause a reactor scram. The automatic scram will cause a turbine trip after a five second delay. The shaft-driven feedwater pump will provide feedwater flow of greater than 3800 gpm for approximately 3.2 minutes during pump coastdown. The turbine trip will signal the motor-driven feedwater pump to start. This signal will be simultaneous with the start of the shaft-driven pump coastdown. The motor-driven feedwater pump will be up to speed and capable of supplying 3420 gpm in about 10 seconds. As a backup to the turbine trip signal, low reactor water level (53") will also signal the motordriven pump to start. This ensures a continuous, uninterrupted supply of high pressure feedwater to the reactor. The electric motor-driven condensate pumps and feedwater booster pumps are capable of providing 3420 gpm at reactor pressures below approximately 332 psig. The flow control valve would admit the full flow of 3420 gpm into the reactor until the low reactor level was regained. At this point, the flow control valve would reduce flow into the reactor until the flow matched the flow out of the break. Necessary pump recirculation to accommodate the

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

decreasing system flow has been provided as a part of the basic pump control system. Consequently, the pump is capable of delivering any flow into the reactor from 3420 gpm down to zero flow.

Distractor:

b. High reactor pressure is not challenged, but pressure will remain closer to normal as compared to the steam break. Reactor water level remains above the lo-lo set point if within the capability of HPCI. See discussion for "a" above.

Distractor:

d. If the main condenser is available as a heat sink, high reactor pressure is not a concern. If the main condenser is lost as a heat sink during an ATWS, then reactor pressure would likely go high (depending on the reactor power level) resulting in initiation of the ECs if ERV pressure control is not established in a timely manner.

References Provided: NONE

Question 58 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 216000 K4.05 3.9/4.1 Initiation of the emergency core cooling systems
Knowledge of NUCLEAR BOILER INSTRUMENTATION design feature(s) and/or interlocks which provide for the following

Question Source

- New

PROC

- N1-OP-13 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

59

SYSID: 21059

Points: 1.00

The plant is at 100% power. Because of a leaking ERV, torus cooling is in service per N1-OP-14; H.5.0, Cooling Torus Water Temperature Using 111 Containment Spray System. When the desired Torus water temperature is reached, the following actions are performed at the specified times:

- 08:00** Containment Spray Pump 111 and Containment Spray Raw Water Pump 111 secured
- 09:30** Draining of the Containment Spray Raw Water Heat Exchanger shell side is complete
- 09:35** 80-16, CONT SPRAY DISCH IV 111, is opened
- 09:40** 80-40, CONT SPRAY BYPASS BV 11, is opened

For these conditions, which one of the following is the EARLIEST TIME at which the containment spray system can be declared operable?

- A. 08:00
- B. 09:30
- C. 09:35
- D. 09:40

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 59 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 59 |
| System ID: | 21059 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-226-1-01, EO-1.7

- Answer: d. The shell side (containment spray) side of the system must be drained and then the IVs opened to return to operable status. Opening 80-16 restores operability for some containment spray but 80-40 must also be opened (Appendix J water seal). (See N1-OP-14, D.11.0) Integrated plant because using containment spray system for torus cooling, but more important is the interrelation with the primary containment function. Depending on the positions of the containment spray intertie valves, the proper flow distribution to the containment spray headers to reduce containment pressure during the first 15 minutes of the LOCA. Therefore draining and alignment of valves is integrated in effect on DW spray capability and primary containment operability for APP J water seals.
- Distractor: a. Securing the pumps places the system in standby (no pumps running) but additional actions are required to restore complete operability.
- Distractor: b. The shell side (containment spray) side of the system must be drained and then the IVs opened to return to operable status. If the IV were opened before draining water would flow into the drywell.
- Distractor: c. Opening 80-16 restores operability for some containment spray but 80-40 must also be opened (Appendix J water seal).

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 59 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.23 3.9/4 Ability to perform specific system and integrated plant procedures during different modes of plant operation

Question Source

- New

PROC

- N1-OP-14 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

60

SYSID: 21217

Points: 1.00

A reactor startup is in progress with the following conditions:

- Main generator just synchronized and loaded to 80mwe
- BEFORE transferring house loads, the following occur:
 - MAIN STEAM RAD MONITOR CH 11 HI/LO in alarm
 - MSL RM 111 and 121 indicate 1875 mrem/hr (full power background at 600)
 - MAIN STEAM RAD MONITOR CH 12 HI/LO in alarm
 - MSL RM 112 and 122 indicate 1500 mrem/hr (full power background at 500)

Which one of the following is the correct action at this time in response to the above conditions?

- A. Scram the reactor and enter the radioactivity release EOP.
- B. Trip the main turbine then initiate a manual vessel isolation.
- C. Notify Chemistry to sample the reactor coolant for gross activity.
- D. Verify a mechanical vacuum pump trip and isolation has occurred.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 60 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO IMPROVEMENT 60 |
| System ID: | 21217 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-SOP-25.2

Answer:

c. For Upscale Alarm: IF Main Steam Radiation Monitor 11 reaches 3.75XNFPB AND channel 12 MSLRM at 3.75 x NFPB, THEN perform the following:

a. Initiate a Manual Reactor Scram.

b. Initiate a Manual Vessel Isolation.

3.75xNFPB for channel 11 = 2250 mrem/hr and 3.75xNFPB for channel 12 = 1875 mrem/hr

Channel 11 (reading 1875 mrem/hr) is at the channel 12 threshold for 3.75XNFPB but not for channel 11

These thresholds have not been met.

The alarm setpoints (1.5XNFPB) are for channel 11 (900 mrem/hr) and for channel 12 (750 mrem/hr).

The appropriate action with alarms just received is to have chemistry sample the reactor coolant activity to determine the cause.

Distractor:

a. Scram and vessel isolation is not required until radiation level is above 3.75xNFPB. Radiation release procedure would not be entered based on the radiation levels present.

Distractor:

b. Scram and vessel isolation is not required until radiation level is above 3.75xNFPB which is not present. Tripping the main turbine will not result in a reactor scram at this power level (approximately 17% reactor power).

Distractor:

d. The mechanical vacuum pump is removed from service prior to reaching 5% reactor power. With the main generator just synchronized and loaded, reactor power is approximately 17% power.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 60 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 239001 A2.05 3.9/4.2 Main steam line high radiation
A2.05 Ability to (a) predict the impacts of the following on the MAIN AND REHEAT STEAM SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:
Main steam line high radiation.

Question Source

- New

PROC

- N1-SOP-25.2 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

61

SYSID: 21218

Points: 1.00

The following conditions exist:

- A FUEL SHUFFLE is in progress
- The Reactor Mode Switch in the REFUEL position
- ALL rods are fully inserted into the reactor core
- STEP 45: movement of a fuel assembly from one core location to a different core location was just released in its assigned core location
- The main grapple is raised two (2) feet, moved over the next core location, and is lowered onto the fuel assembly in Step 46 (the grapple hooks are still open)
- STEP 46: requires movement of a fuel assembly from the reactor core location to the spent fuel storage pool

Which one of the following is the CURRENT STATE and CHANGE IN STATE of the Refueling Interlock Rod Block as the next step (step 46) is performed?

With the main grapple lowered onto the fuel assembly in Step 46 and the grapple hooks still open, the rod block is:

- A. Present, and clears when the fuel assembly is raised to the normal-up position.
- B. Present, and clears when the refueling bridge is no longer over the reactor core.
- C. Clear, actuates when the main hoist is loaded, and then clears again when the main hoist is raised to the normal-up position.
- D. Clear, actuates when the main hoist is loaded, and then clears again when the refueling bridge is no longer over the reactor core.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 61 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 61 |
| System ID: | 21218 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

N1-ST-W3

Answer:

d. The refueling interlocks at NMP1 are different from most in that the main hoist not normal-up is not an input for a rod block – in other words if the main hoist were normal-up and not loaded with the refueling bridge over the reactor core, at most plants the refueling interlock rod block would actuate as soon as the main hoist is lowered (not normal-up) but this is not the case for NMP1. The rod block is only present when the refueling bridge is over the reactor core with the main hoist loaded independent of the main hoist position (not normal-up). Therefore, for the conditions presented, when the fuel assembly in step 45 is seated (unloaded) the rod block clears and remains clear until step 46 is latched and raised (loaded). The rod block remains present until the refueling bridge is no longer over the reactor core. When the main hoist is raised to normal-up which is required before transporting the fuel assembly to the spent fuel pool the rod block is still present because the main hoist is loaded with the refueling bridge over the reactor core.

Distractor:

a. b. The refueling interlocks at NMP1 are different from most in that the main hoist not normal-up is not an input for a rod block – in other words if the main hoist were normal-up and not loaded with the refueling bridge over the reactor core, at most plants the refueling interlock rod block would actuate as soon as the main hoist is lowered (not normal-up) but this is not the case for NMP1. The rod block is only present when the refueling bridge is over the reactor core with the main hoist loaded independent of the main hoist position (not normal-up). Therefore, for the conditions presented, when the fuel assembly in step 45 is seated (unloaded) the rod block clears and remains clear until step 46 is latched and raised (loaded). Distracter "a" is also incorrect because the rod block does not clear until the refueling bridge is no longer over the

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Distractor:

reactor vessel with the main hoist loaded.

c. The rod block remains present until the refueling bridge is no longer over the reactor core. When the main hoist is raised to normal-up which is required before transporting the fuel assembly to the spent fuel pool the rod block is still present because the main hoist is loaded with the refueling bridge over the reactor core.

References Provided: NONE

Question 61 Cross References (table item links)

10CFR55

- 41(b)(13)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 234000 A3.02 3.1/3.7 Fuel Handling, Ability to monitor automatic operations of the Fuel Handling Equipment including: Interlock operation

Question Source

- New

PROC

- N1-ST-W3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

62

SYSID: 21062

Points: 1.00

Which one of the following describes the potential consequences, if any, of operating with Feedwater Flow Control Valves 11 and 12 in automatic with feed flow at 2×10^6 lbs/hr per N1-OP-16, Feedwater System Booster Pump to Reactor?

- A. There are no potential consequences when operating in this configuration.
- B. One flow control valve could go full closed causing water hammer and pipe whip.
- C. One flow control valve could go full open causing pump runout and motor damage.
- D. More than one flow control valve in auto may cause unstable system performance.

Answer: D

Associated objective(s):

Development Area (FIO)

Question 62 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 62 |
| System ID: | 21062 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-259-1-01, EO-1.7 |

This question was derived from bank SYSID 12567
References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 62 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 259001 A4.04 3.1/2.9 System valves
A.4.04 Ability to manually operate and/or monitor in the control room:

Question Source

- Bank

PROC

- N1-OP-16, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

63

SYSID: 21063

Points: 1.00

The plant is operating at 100% power. A loss of RPS Bus 12 occurs.

Which one of the following describes the response of the Reactor Building (RB) Ventilation System and Reactor Building Emergency Ventilation (RBEVS)?

- A. RB Ventilation isolates. RBEVS is running.
- B. RB Ventilation continues to operate. RBEVS is running.
- C. RB Ventilation isolates. RBEVS is off but a ½ actuation signal is present.
- D. RB Ventilation continues to operate. RBEVS is off but a ½ actuation signal is present

Answer: A

Associated objective(s):

Development Area (FIO)

Question 63 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 63 |
| System ID: | 21063 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-273-1-01, EO-1.5 |

Answer: a. Although power is lost to only one of the two radiation monitors, which would not in itself cause a RB isolation and RBEVS start, the loss of power to the isolation/actuation logic affects both instruments within the isolation/actuation logic causing the RB isolation and RBEVS start.

Distractor: b,c,d, all are incorrect because either logic channel will cause the other logic channel to trip.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 63 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 272000 K6.01 3/3.2 Reactor protection system
K6.01 Knowledge of the effect that a loss or malfunction of the following will have on the RADIATION MONITORING SYSTEM: Reactor Protection System.

Question Source

- New

PROC

- N1-OP-40 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

64

SYSID: 21064

Points: 1.00

The Reactor Building (RB) differential pressure (d/p) controller has been placed in manual per N1-OP-10, H.7.0, Controller Operation in Manual

- The operator pressed the **A/M** button to change from auto to manual control and confirmed the controller displayed an **M**
- The operator confirmed damper control selected.
- With reactor building d/p at -0.30 psid, the operator presses the controller up arrow (▲) momentarily.

Which one of the following describes the response of the RB ventilation system and the resultant change in RB d/p?

- A. Lower supply flow and improve the RB d/p (more negative).
- B. Raise supply flow and improve the RB d/p (more negative).
- C. Lower supply flow and degrade the RB d/p (less negative).
- D. Raise supply flow and degrade the RB d/p (less negative).

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 64 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 64 |
| System ID: | 21064 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-288-1-01, EO-1.7 |

Answer: d. Increasing output/damper position will increase (raise) supply flow and decrease (lower) reactor building differential pressure (less negative). Decreasing output/damper position will decrease (lower) supply flow and increase building differential pressure (more negative).

Distractor: a. Supply flow raises and d/p degrades.

Distractor: b. With supply flow raising the d/p degrades.

Distractor: c. Supply flow raises not lowers. With supply flow lowering the d/p improves

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 64 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 288000 K5.02 3.2/3.4 Differential pressure control
K5.02 Knowledge of the operational implications of the following concepts as they apply to PLANT VENTILATION SYSTEMS: Differential pressure control.

Question Source

- New

PROC

- N1-OP-10 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

65

SYSID: 21065

Points: 1.00

During the month of MAY, the Control Room Ventilation System chiller alignment is changed as follows:

- Locally at 210.1-119, CONTROL ROOM CHILLER 11, the operator depresses pushbutton Compressor Sequence 1
- Locally at 210.1-120, CONTROL ROOM CHILLER 12, the operator depresses pushbutton Compressor Sequence 1

Per N1-OP-49, Control Room Ventilation System, which one of the following statements is correct regarding the above operator actions?

- A. Mis-operation aligning 60% compressors 111 and 121 for LAG operation.
- B. Mis-operation aligning 40% compressors 112 and 122 for LAG operation.
- C. Correct operation aligning 60% compressors 111 and 121 for LEAD operation.
- D. Correct operation aligning 40% compressors 112 and 122 for LEAD operation.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 65 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 65 |
| System ID: | 21065 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-288-1-03, EO-1.7

Answer:

c. The Control Room Ventilation System chillers are operated with the 60% compressors (111 and 121) in lead during warm months (May - September), and the 40% (112 and 122) compressors in lead during the cool months (November - March). This alignment minimizes unnecessary cycling of the compressors.

7.0 Shifting Chiller Unit Lead Compressors From 40% to 60%

NOTE: This section is used **every spring** to shift lead compressor alignment for summer operation.

7.1 Locally at 210.1-119, CONTROL ROOM CHILLER 11, depress pushbutton **Compressor Sequence 1**

7.2 Locally at 210.1-120, CONTROL ROOM CHILLER 12, depress pushbutton **Compressor Sequence 1**

8.0 Shifting Chiller Unit Lead Compressors From 60% to 40%

NOTE: This section is used **every autumn** to shift lead compressor alignment for winter operation.

8.1 Locally at 210.1-119, CONTROL ROOM CHILLER 11, depress pushbutton **Compressor Sequence 2**

8.2 Locally at 210.1-120, CONTROL ROOM CHILLER 12, depress pushbutton **Compressor Sequence 2**

Distractor: a. Compressors 111 and 121 are aligned for lead operation which is a correct operation for the month of May.

Distractor: b. Compressors 112 and 122 are aligned for lag operation however this is a correct operation for the month of May, not a mis-operation.

Distractor: d. Compressors 111 and 121 are aligned for lead operation not compressors 112 and 122. Compressors 112 and 122 aligned for lead operation is correct for the months of November through March.

References Provided: **NONE**

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 65 Cross References (table item links)

10CFR55

- 41(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 290003 A3.01 3.3/3.5 Initiation/reconfiguration
A3.01 Ability to monitor automatic operations of the CONTROL ROOM HVAC including:
Initiation/reconfiguration.

Question Source

- New

PROC

- N1-OP-49 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

66

SYSID: 21066

Points: 1.00

Following seven (7) days of vacation, an operator works twelve (12) hours on the first day back on shift and then works an additional four (4) hours of overtime.

Assume NO extension is authorized, which one of the following describes the MAXIMUM number of hours this operator can work the next day WITHOUT exceeding the Nine Mile Point working hour limitations?

- A. 4 hours
- B. 8 hours
- C. 12 hours
- D. 16 hours

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 66 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 66 |
| System ID: | 21066 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

Answer:

b. The restrictions are 16 hours in any 24-hour period and 24 hours in any 48-hour period. Since the operator worked 16 hours on the first day, then without any extension the operator is restricted to 8 hours on the second day of work. Question matches K/A in that working hours limitations are contained in/required by the facility license.

Per the Facility Operating License, License NO. DPR-63, item 2.C.(2)

"Technical Specifications" The

Technical Specifications contained in Appendix A, which is attached hereto, as revised through Amendment No.

172 is hereby incorporated into this license. Nine Mile Point Nuclear Station, LLC shall operate the facility in accordance with the Technical Specifications."

Per Tech Spec Admin Section, 6.2.2.d:

"Administrative procedures shall be developed and implemented to limit the working hours of personnel who perform safety related functions (e.g., licensed SROs, licensed Reactor Operators (ROs), key radiation protection personnel, auxiliary operators, and key maintenance personnel). The controls shall include guidelines on working hours that ensure adequate shift coverage shall be maintained without routine heavy use of overtime. Any deviation from the above guidelines shall be authorized in advance by the plant manager or the plant manager's designee, in accordance with approved administrative procedures, with documentation of the basis for granting the deviation. Routine deviation from the working hour guidelines shall not be authorized."

Distractor:

a. Can work 8 hours

Distractor:

c. Can only work 8 hours without an approved extension

Distractor:

d. Can only work 8 hours without an approved extension

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 66 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.10 2.7/3.9 Knowledge of conditions and limitations in the facility license

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

67

SYSID: 21067

Points: 1.00

Regarding cardox valves **EMPC 99-92A** and **HBV 99-92** for ZONE C-2141, EDG 102, and assuming the cardox system responds per design, which one of the following describes their integrated valve operation in response to a valid fire detection system actuation for this zone?

- A. EMPC 99-92A is energized to supply pneumatic pressure, which opens HBV 99-92.
- B. EMPC 99-92A is energized and vents pneumatic pressure, which allows HBV 99-92 to open.
- C. EMPC 99-92A is de-energized to supply pneumatic pressure, which opens HBV 99-92.
- D. EMPC 99-92A is de-energized and vents pneumatic pressure, which allows HBV 99-92 to open.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 67 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 67 |
| System ID: | 21067 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Answer: |

a. EMPC- 99-92A is normally de-energized and must be energized. When energized it repositions to supply cardox (pneumatics) to open HBV 99-92.

The same valid actuation will cause normally energized EMPC 99-97A to deenergize and supply cardox (pneumatics) to open HBV-99-97.

Distractors: b. c. d. See justification above.

References Provided: The following prints are provided for use when answering this question:

- C-18000-C, Piping, Instrument, and Equipment Symbols
- C-18039-C, Cardox Fire Extinguishing System P&I Diagram

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 67 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

DRW

- C-18000-C Rev. na
- C-18039-C Rev. NA

NUREG 1123 KA Catalog Rev. 2

- G2.1.24 2.8/3.1 Ability to obtain and interpret station electrical and mechanical drawings

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

68

SYSID: 21068

Points: 1.00

The plant is preparing to perform a startup with the following conditions:

- You are performing valve lineup of the Backfill System
- Valve 28.1-43 has a Caution Clearance Section tag attached to the valve
- The tag indicates the valve is to remain closed until Backfill is ready to be initiated

Which one of the following describes the actions required to complete this valve lineup?

The operator shall

- A. leave the valve in its present position, notify the CSO and SSS of the discrepancy and note the discrepancy
- B. leave the valve in its present position and indicate the Clearance Section Number in the INITIALS/DATE column
- C. remove the Clearance Section tag, indicate the Clearance Section number on the valve lineup and position the valve
- D. remove the Clearance Section tag and update the Clearance Section Tag Removal Sheet then position the valve

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 68 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 68 |
| System ID: | 21068 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | This question derived from bank SYSID 17196 |

| | |
|-------------|---|
| Answer: | b. indicate Clearance Section Number in INITIALS/DATE is correct - Per N1-VLU-01, Section 5.1.4, the clearance section tag is not to be removed and the valve is not to be manipulated unless the specific conditions for manipulation of the valve are satisfied. |
| Distractor: | a. Notify the CSO/SSS of discrepancy is wrong - Per Section 5.1.2 of N1-VLU-01, valves that are out of expected position with a clearance section tag installed are NOT discrepancies. |
| Distractor: | c. Remove the Clearance Section Tag is wrong - Per GAP-OPS-02 Clearance Section tags are removed using the guidance provided on the Clearance Section Tag Removal Sheet. The presence of the tag is also to be noted on the valve lineup sheet under the INITIALS/DATE column. |
| Distractor: | d. Update the Clearance Section Tag Removal Sheet is wrong - Again, N1-VLU-01 speaks to this in 5.1.4 The valve is absolutely NOT to be repositioned per GAP-OPS-02 until the Clearance Section Holder or their supervisor releases the clearance section. This will be indicated in the Clearance System and a separate lineup performed to restore the system called a RESTORATION LINEUP. |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 68 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.29 3.4/3.3 Knowledge of how to conduct and verify valve lineups

Question Source

- Bank

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

69

SYSID: 21211

Points: 1.00

During the performance of N1-ST-Q8B, Liquid Poison Pump 12 And Check Valve Operability Test, the following data is recorded:

- LP Test Tank Temp at 85°F.
- LP Tank Level at 1450 gallons
- LP Pump 12 discharge pressure at 1285 psig
- LP Pump 12 amperage is 34.4 amps
- LP Pump 12 flow rate is 30.8 gpm
- LP Pump 12 vibration at point 1V and 2V is 1.90 mils

- After recording the vibration readings and BEFORE proceeding to the next step in the procedure, a plant transient occurs that results in aborting this test. The system is returned to a standby lineup.

Which one of the following is the correct action regarding this surveillance test?

- A. The test CANNOT be considered a No-Test. EXIT the TS action entered during performance of the test.
- B. The test CANNOT be considered a No-Test. CONTINUE in the TS action entered during performance of the test.
- C. Consider the test a No-Test and complete the entire test at a later time. EXIT the TS action entered during performance of the test.
- D. Consider the test a No-Test and complete the entire test at a later time. CONTINUE in the TS action entered during performance of the test.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 69 Details

| | |
|-------------------|-----------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 69 |
| System ID: | 21211 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Comment:

GAP-SAT-01; 3.6.4.
N1-ST-Q8B, Section 10.0.

Answer:

b. Per GAP-SAT-01, if a surveillance test is started and cannot be completed, it may be aborted and **considered a no-test provided:**

- the completed portion of the test **has not produced unacceptable results**
- inability to complete the test is not due to failed components within the scope of the test
- the component/system is returned to an operable condition unless otherwise directed by the SM

For the conditions already completed for this test, the LP system is inoperable. Although Point 1V vibration is higher than expected (alert range) and only requires doubling the frequency, and although the pump amps are high, this is not a TS operable condition, the pump flow is just below the acceptable limit (in the required action range) and the system is inoperable.

Distractor: a. The system is inoperable and the TS action entered during the performance of the test must be continued.

Distractor: c. The test **cannot** be considered a No-Test because the completed portion of the test has produced unacceptable results (inoperable pump). The system is inoperable and the TS action entered during the performance of the test must be continued.

Distractor: d. The test **cannot** be considered a No-Test because the completed portion of the test has produced unacceptable results (inoperable pump).

References Provided: N1-ST-Q8B, entire procedure.

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 69 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.12 3/3.4 Knowledge of surveillance procedures

Question Source

- New

PROC

- GAP-SAT-01 Rev. NA
- N1-ST-Q8B, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

70

SYSID: 21070

Points: 1.00

A clearance section tag for a system vent valve must be relocated so the valve can be removed from the system piping.

Which one of the following describes who must authorize the relocation before it occurs?

Tag relocation is required to be authorized by the

- A. on-shift SSS alone.
- B. CSO and CRS together.
- C. CSO or CRS independently.
- D. CSO or delegated licensed RO.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 70 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 70 |
| System ID: | 21070 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | This question was derived from bank SYSID 17214. |

Answer: d. CSO or delegated RO is **correct** - Tag relocation is under the purview of the Controller, defined in section 4.15 of GAP-OPS-02 as the CSO who performs the administrative function of issuing Clearance Sections as the agent for the SSS. The CSO may delegate this authority to another licensed RO per section 2.10.

Distractor: a,b&c Any option mentioning the SSS or CRS is **wrong** - the SSS responsibility as defined in GAP-OPS-02 is to authorize the isolation of equipment, ensure compliance with Tech Specs and verify adequacy of isolation boundaries.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 70 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 1: Items written at a low cognitive level, low importance factor, or requiring only recall (memory) to obtain the answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.13 3.6/3.8 Knowledge of tagging and clearance procedures

Question Source

- Bank

PROC

- GAP-OPS-02 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

71

SYSID: 21071

Points: 1.00

Given the following during a refueling outage:

- Phase 1 core shuffle is just completed
- In vessel work includes withdrawing a control rod to position 48 and uncoupling it to support change out of the control rod blade

Per N1-FHP-27C, Core Shuffle, which one of the following is an administrative requirement to be satisfied PRIOR TO withdrawing this control rod?

- A. Jumpers installed to bypass all refueling interlocks.
- B. Cell has no fuel and a double blade guide installed.
- C. Caution tag posted on the rod motion control switch.
- D. Clearance hung on this control rods hydraulic control unit.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 71 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 71 |
| System ID: | 21071 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-234-1-01, EO-1.7 |

Answer: b. Per N1-FHP-27C; 1.1.5: Attachment 2 is performed to withdraw control rods in core cells that have been offloaded. This check provides a double verification that the **cell is empty** prior to rod withdrawal (i.e. Compliance with T.S.4.5.3), verifies defeat of the Refuel One Rod Permit Rod Block, and tags out the associated HCU per GAP-OPS-02.
Per N1-FHP-27C; Attachment 2: (1) **Cell verified empty**, (2) All other control rods in core cells containing one or more fuel assemblies are fully inserted, (3) All fuel loading operations have been suspended, (4) **Verify Double Blade guide is installed to support control rod during control rod withdraw.**

Distractor: a. Jumpers are installed to bypass the one rod permissive after the rod is withdrawn to position 48 and uncoupled. All refueling interlocks are not bypassed.

Distractor: c. Caution tag is posted on the rod motion control switch during fuel movement, not during control rod maintenance work.

Distractor: d. Clearance is hung on HCU 101 and 102 after control rod is withdrawn to position 48 and uncoupled.

References Provided: **NONE**

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 71 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.26 2.5/3.7 Knowledge of refueling administrative requirements

Question Source

- New

PROC

- N1-FHP-27C Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

72

SYSID: 21072

Points: 1.00

The plant is at 35% power, with the following:

- A normal shutdown is in progress in preparation for an outage
- Chemistry reports no indications of airborne contamination in the containment
- The CRS has directed that containment de-inerting be commenced

Which one of the following identifies the vent path used when purging the drywell?

The purge will be from the drywell vent and purge valves, 201-31 and 201-32 to the ...

- A. Main Stack via fan 201-35
- B. RBEVS via BV 201-10 and 202-37(38)
- C. Main Condenser via BV 201-11
- D. RBVS via BV 201-18 and 202-36

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 72 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 72 |
| System ID: | 21072 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-223-1-04, EO-1.7 |

This questions was derived from bank SYSID 17687
EO-1.7.b

| | |
|-------------|---|
| Answer: | a. "stack..." is correct. The provided plant conditions indicate that the reactor is above 212°F with radioactivity below the limits requiring use of the RBEVS. Per N1-OP-9, Section G.1.0 and C-18014-C Sheet 1, the correct vent path to use is through the vent and purge fan to the stack. |
| Distractor: | b. "RBEVS,," is incorrect as this is not required by the conditions presented. |
| Distractor: | c. "Main Condenser.." is incorrect as this vent path is not permitted under any normal operating procedure and may only be directed by the ED (see EOP bases and SDBD-202). |
| Distractor: | d. "RBVS..." is incorrect as this does not provide adequate flow rate to provide suitable sweeping of nitrogen from the containment during the deinerting process. |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 72 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

DRW

- C-18013-C Rev. NA
- C-18014-C Rev. NA

NUREG 1123 KA Catalog Rev. 2

- G2.3.9 2.5/3.4 Knowledge of the process for performing a containment purge

Question Source

- Bank

PROC

- N1-OP-9 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

73

SYSID: 21210

Points: 1.00

Your team is planning a job to be performed in an area classified as a high-radiation area due to a crud trap.

- The dose rate at the component to be worked is 400 mrem/hour.
- Using a long-handled tool reduces the worker's exposure to $\frac{1}{2}$ the dose rate at the component to be worked.
- The job takes 1 hour without using the long-handled tool
- The job takes $1\frac{1}{2}$ hours if the long-handled tool is used.
- Installing temporary shielding on the crud trap will lower the dose rate at the component to be worked to 200 mrem/hour.
- Installation and removal of temporary shielding adds 225 mrem of exposure.

Which of the following options satisfies the requirement to perform the job with the **LEAST TOTAL EXPOSURE**?

- A. Install shielding. Use the tool.
- B. Install shielding. Do not use the tool.
- C. Do not install shielding. Use the tool.
- D. Do not install shielding. Do not use the tool.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 73 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC RO REPLACEMENT 73 |
| System ID: | 21210 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Answer: c. Do not install shielding. Use the tool. $400 \times 0.5 \times 1.5 = 300 \text{ mrem}$ |
| | Distractor: a. Install shielding. Use the tool. $225 + [(200 \times 0.5) \times 1.5] = 375 \text{ mrem}$ |
| | Distractor: b. Install shielding. Do not use the tool. $225 + (200 \times 1.0) = 425 \text{ mrem}$ |
| | Distractor: d. Do not install shielding. Do not use the tool. $400 \times 1.0 = 400 \text{ mrem}$ |

References Provided: NONE

Question 73 Cross References (table item links)

10CFR55

- 41(b)(12)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.3.10 2.9/3.3 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

74

SYSID: 21074

Points: 1.00

Twenty (20) control rods failed to insert when the reactor was scrammed. They are at position 48.

Assuming the EOP-3.1, Alternate Control Rod Insertion, procedure steps for each method identified below will be successful in control rod movement, which one of the following methods will insert these control rods in the SHORTEST PERIOD of time?

- A. Scramming control rods electrically.
- B. Scramming control rods by venting the scram air header
- C. Driving control rods by venting the over piston volume.
- D. Driving control rods using the reactor manual control system.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 74 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC RO 74 |
| System ID: | 21074 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-11, EO-1.2 |

Answer: a. Performed if any group solenoid or Backup Scram light is lit; consists of pulling fuses in the aux control room to insert all control rods simultaneously. Remove five (5) fuses in cabinet 1S-53 AND remove five (5) fuses in cabinet 1S-55 then all control rods insert.

Distractor: b. Consists of the following:
1. Unlock and Close 113-3091, (Scram Air Header Supply valve, located in the Reactor Building, NW stairwell, between Elev. 237 and 261).
2. Remove the Vent Pipe Cap from 113-230, SCRAM AIR HEADER EMERGENCY VENT VALVE, RB EI 237 (located at northwest corner of HCU Bank).
3. Unlock AND Open 113-230, SCRAM AIR HEADER EMERGENCY VENT VALVE

The fuses in the aux control room can be pulled before obtaining the tools to perform this method.

Distractor: c. The over piston area of the control rods are vented one at a time. This is very time consuming compared to pulling fuses to insert all control rods.

Distractor: d. The control rods are driven one at a time. This is very time consuming compared to pulling fuses to insert all control rods.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 74 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.7 3.1/3.8 Knowledge of event based EOP mitigation strategies

Question Source

- New

PROC

- N1-EOP-3.1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

75

SYSID: 21075

Points: 1.00

A loss of Service Water has occurred, with the following:

- H1-4-2, R BUILDING SW PRESS/SERV W PUMP HDR PRESS LOW is in alarm
- N1-SOP-18.1, Service Water Failure / Low Intake Level is entered
- With both service water pumps running service water header pressure is 20 psig and steady

Per N1-SOP-18.1, which one of the following actions will be directed NEXT by the ASSS?

- A. Start Emergency Service Water pumps.
- B. Place the reactor mode switch to shutdown.
- C. Supply fire water to closed loop cooling heat exchangers.
- D. Lower reactor power to control closed loop cooling temperatures

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 75 Details

Question Type: Multiple Choice
Topic: NRC RO 75
System ID: 21075
User ID:
Status: Active
Must Appear: No
Difficulty: 0.00
Time to Complete: 0
Point Value: 1.00
Cross Reference: LC1 03-01
User Text:
User Number 1: 0.00
User Number 2: 0.00
Comment: Objective: O1-OPS-001-276-1-01, EO-1.7

Answer: a. SW header pressure cannot be restored requiring start of ESW and then a reactor scram

| IF | THEN |
|---|--|
| Neither Service Water pump can be started, OR Service Water Hdr pressure can NOT be restored, AND As directed by SRO, | 1. Start Emergency Service Water pumps. 2. Scram the Reactor. 3. Perform N1-SOP-1 concurrently. 4. Initiate Emergency Condensers. 5. Close MSIVs. 6. Trip all Rx Recirculation Pumps. |

Distractor: b. ESW pumps are started then the reactor scram is inserted.
Distractor: c. This is required if the ESW pumps cannot be started. This condition cannot be determined at this time.
Distractor: d. A reactor scram is required, not just a power reduction. This action is appropriate is service water header pressure returned to normal but it is below the acceptable operating range.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 RO WRITTEN EXAMINATION

Question 75 Cross References (table item links)

10CFR55

- 41(b)(10)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.24 3.3/3.7 Knowledge of loss of cooling water procedures

Question Source

- New

PROC

- N1-SOP-18.1, Rev. NA

Question Setting

- C1 (License class closed reference)

SUBJECTIVE SCORE INSTRUCTOR USE ONLY

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

(T) (F) KEY

| | | | | | |
|----|---|---|---|---|---|
| 1 | A | B | C | D | E |
| 2 | A | B | C | D | E |
| 3 | A | B | C | D | E |
| 4 | A | B | C | D | E |
| 5 | A | B | C | D | E |
| 6 | A | B | C | D | E |
| 7 | A | B | C | D | E |
| 8 | A | B | C | D | E |
| 9 | A | B | C | D | E |
| 10 | A | B | C | D | E |
| 11 | A | B | C | D | E |
| 12 | A | B | C | D | E |
| 13 | A | B | C | D | E |
| 14 | A | B | C | D | E |
| 15 | A | B | C | D | E |
| 16 | A | B | C | D | E |
| 17 | A | B | C | D | E |
| 18 | A | B | C | D | E |
| 19 | A | B | C | D | E |
| 20 | A | B | C | D | E |
| 21 | A | B | C | D | E |
| 22 | A | B | C | D | E |
| 23 | A | B | C | D | E |
| 24 | A | B | C | D | E |
| 25 | A | B | C | D | E |
| 26 | A | B | C | D | E |
| 27 | A | B | C | D | E |
| 28 | A | B | C | D | E |
| 29 | A | B | C | D | E |
| 30 | A | B | C | D | E |
| 31 | A | B | C | D | E |
| 32 | A | B | C | D | E |
| 33 | A | B | C | D | E |
| 34 | A | B | C | D | E |
| 35 | A | B | C | D | E |
| 36 | A | B | C | D | E |
| 37 | A | B | C | D | E |
| 38 | A | B | C | D | E |
| 39 | A | B | C | D | E |
| 40 | A | B | C | D | E |
| 41 | A | B | C | D | E |
| 42 | A | B | C | D | E |
| 43 | A | B | C | D | E |
| 44 | A | B | C | D | E |
| 45 | A | B | C | D | E |
| 46 | A | B | C | D | E |
| 47 | A | B | C | D | E |
| 48 | A | B | C | D | E |
| 49 | A | B | C | D | E |
| 50 | A | B | C | D | E |

FORM NO. 888-E

| IMPORTANT | |
|---|--|
| <p>USE NO. 2 PENCIL ONLY</p> <p>• MAKE DARK MARKS</p> <p>• ERASE COMPLETELY TO CHANGE</p> <p>• EXAMPLE: A B C D E</p> | <p>TO USE SUBJECTIVE SCORE FEATURE:</p> <p>• Mark total possible subjective points</p> <p>• Only one mark per line on key</p> <p>• 163 points maximum</p> <p>EXAMPLE OF STUDENT SCORE:</p> <p>100 90 80 70 60 50 40 30 20 10 9 8 7 6 5 4 3 2 1 0</p> |

SCANTRON

| | | |
|---------|--|----------|
| NAME | | |
| SUBJECT | | TEST NO. |
| DATE | | HOUR |

| TEST RECORD | |
|-------------|--|
| PART 1 | |
| PART 2 | |
| TOTAL | |

PART 1

TO REORDER CALL 1-800-722-6876 CUSTOMER SERVICE DEPARTMENT

NAME: SRO KEY

SS #: _____

COURSE: U1 Initial License Class

DATE: November 23, 2004

GRADE: _____

TRAINING ID: NRC RO/SRO Written Exam

Trainees will be judged to have willfully violated the integrity of an examination if they are found to have:

- Utilized unauthorized documents during the examination
- Secured unauthorized documents for the purpose of accessibility during an examination.
- Solicited examination information from other trainees or any other individuals.
- Provided examination information to other trainees during an examination.
- Reviewed or attempted to review materials that are unauthorized, including the examination prior to implementation, the examination answer key, or the answers developed by any other trainee during the examination.

I have read and understand the above.

SIGNATURE: _____

DATE: _____

25/1004

SUBJECTIVE SCORE INSTRUCTOR USE ONLY

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

(T) (F) KEY

100 2 3 5

51 A B C D E

52 A B C D E

53 A B C D E

54 A B C D E

55 A B C D E

56 A B C D E

57 A B C D E

58 A B C D E

59 A B C D E

60 A B C D E

61 A B C D E

62 A B C D E

63 A B C D E

64 A B C D E

65 A B C D E

66 A B C D E

67 A B C D E

68 A B C D E

69 A B C D E

70 A B C D E

71 A B C D E

72 A B C D E

73 A B C D E

74 A B C D E

75 A B C D E

76 A B C D E

77 A B C D E

78 A B C D E

79 A B C D E

80 A B C D E

81 A B C D E

82 A B C D E

83 A B C D E

84 A B C D E

85 A B C D E

86 A B C D E

87 A B C D E

88 A B C D E

89 A B C D E

90 A B C D E

91 A B C D E

92 A B C D E

93 A B C D E

94 A B C D E

95 A B C D E

96 A B C D E

97 A B C D E

98 A B C D E

99 A B C D E

100 A B C D E

IMPORTANT

USE NO. 2 PENCIL ONLY

MAKE DARK MARKS

ERASE COMPLETELY TO CHANGE

EXAMPLE: (A) (B) (C) (D) (E)

TO USE SUBJECTIVE SCORE FEATURE:

Mark total possible subjective points

Only one mark per line on key

163 points maximum

EXAMPLE OF STUDENT SCORE:

100 2 3 5

PART 2

| | | | |
|---------|--|----------|--|
| NAME | | | |
| SUBJECT | | TEST NO. | |
| DATE | | HOUR | |

TEST RECORD

| | |
|--------|--|
| PART 1 | |
| PART 2 | |
| TOTAL | |

FEED THIS DIRECTION

| QUESTION # | REFERENCE PROVIDED FOR USE |
|------------|--|
| 1 | NONE |
| 2 | NONE |
| 3 | EAL MATRIX |
| 4 | EOP-3 |
| 5 | EOP-4 |
| 6 | EOP-2, EOP-4 |
| 7 | EOP-2 |
| 8 | EAL MATRIX |
| 9 | NONE |
| 10 | DWG C-18015-C, TS 3.1.5, 3.2.9, 3.6.2.a, 3.6.2.b |
| 11 | EOP-2, EOP-5/6 |
| 12 | EOP-5 |
| 13 | NONE |
| 14 | NONE |
| 15 | CORE MAP |
| 16 | TS 3.6.3, 10CFR50.72 |
| 17 | CONTROL ROD SEQUENCE SHEETS RWM GROUPS 1-4, TS 3.1.1.b |
| 18 | TS 3.4.1 |
| 19 | NONE |
| 20 | NONE (OD-3 OPTION 1/CTP LOG PROVIDED FOR USE) |
| 21 | NONE |
| 22 | NONE |
| 23 | NONE |
| 24 | NONE |
| 25 | EPIP-EPP-08, 10 MILE EPZ MAP WITH ERPA AND TOWNSHIPS (COLOR) |

| REFERENCE PROVIDED FOR USE |
|--|
| EAL MATRIX |
| EOP-2 |
| EOP-3 |
| EOP-4 |
| EOP-5 |
| DWG C-18015-C, TS 3.1.5, 3.2.9, 3.6.2.a, 3.6.2.b |
| CORE MAP |
| TS 3.6.3, 10CFR50.72 |
| CONTROL ROD SEQUENCE SHEETS RWM GROUPS 1-4, TS 3.1.1.b |
| TS 3.4.1 |
| NONE (OD-3 OPTION 1/CTP LOG PROVIDED FOR USE) |
| EPIP-EPP-08, 10 MILE EPZ MAP WITH ERPA AND TOWNSHIPS (COLOR) |

U.S Nuclear Regulatory Commission
Site-Specific SRO Written Examination

Applicant Information

Name:

Date:

Facility/Unit: Nine Mile Point Unit 1

Region: I

Reactor Type: 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
Points

____ / ____ / ____

Applicant's Score

____ / ____ / ____ Points

Applicant's Grade

____ / ____ / ____ Points

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

1

SYSID: 21076

Points: 1.00

The plant is at 100% power. The Static Battery Charger (SBC) alignment will be changed as follows:

- SBC 161A will be removed from service for 4 hours for maintenance.
- SBC 161A will be transferred to SBC 161B per N1-OP-47A, Section F.2.0, Shifting from SBC 161A to SBC 161B.

Which one of the following is the correct application of TS 3.6.3 for the above conditions including the justification for the action?

- A. It is not necessary to enter the actions of TS 3.6.3 because MG 167 is available as an alternate battery charger before and after aligning SBC 161B for service.
- B. Enter TS 3.6.3 because this battery system is inoperable for the time period from when SBC 161A is disconnected until SBC 161B is connected for service.
- C. Enter TS 3.6.3 for a loss of battery system and continue in the TS action once the transfer is complete. Restore SBC 161A to operable within 24 hours to avoid a plant shutdown.
- D. It is not necessary to enter the actions of TS 3.6.3 because SBC 161B is connected to this battery system before disconnecting SBC 161A maintaining this battery system operable.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 1 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 1 |
| System ID: | 21076 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-263-1-01, EO-1.8.a

- Answer: b. The transfer from SBC 161A to SBC 161B requires disconnecting SBC 161A from the battery system before connecting SBC 161B to the battery system. Per T.S. 3.6.3 bases a battery system shall have a minimum of 106 volts at the battery terminals to be considered operable. With no battery charger connected this requirement is determined not met. With no battery charger in service (both disconnected from the battery system) the battery system is considered inoperable and TS 3.6.3 applies. Once SBC 161B is in service, TS 3.6.3 LCO can be exited.
- Distracter: a. Although MG 167 can be used as a battery charger, it is not safety related and cannot be used to avoid entry into TS 3.6.3 LCO.
- Distracter: c. This is the correct action if both SBC 161A/B or 171A/B are removed from service: Removal of both Static Battery Chargers for a battery system are treated as loss of a battery system. A battery charger must be returned to service within 24 hours per T.S. 3.6.3.h or take the action required by T.S. 3.1.5 which requires reactor coolant pressure be reduced to 110 psig or less and reactor coolant temperature be reduced to saturation temperature or less within 10 hours. Although MG 167 can be used as a battery charger, it is not safety related and cannot be used to exit the LCO.
- Distracter: d. The transfer from SBC 161A to SBC 161B requires disconnecting SBC 161A from the battery system before connecting SBC 161B to the battery system. Momentary TS 3.6.3 entry is required

References Provided: None

N1-OP-47A; F.3.0, D.9.0

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 1 Cross References (table item links)

10CFR55

- 43(b)(2)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295004 AA2.03 2.8/2.9 Battery voltage
AA2.03 Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER: Battery voltage.

Question Source

- New

PROC

- N1-OP-47A Rev. NA

TECHSPEC

- 3.6.3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

2

SYSID: 21077

Points: 1.00

The plant is in a refueling outage ready to start the first fuel shuffle. Before starting fuel movement, Shutdown Cooling (SDC) is lost.

Which one of the following is required if actual temperature measurements indicate reactor water temperature is projected to exceed 140°F?

- A. Perform a time to boil estimation.
- B. Perform a feed and bleed to/from the Fuel Pool.
- C. Establish conditions for entering Hot Shutdown.
- D. Establish conditions for returning to Cold Shutdown.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 2 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 2 |
| System ID: | 21077 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-205-1-01, EO-1.8.a |

| | |
|-------------|--|
| Answer: | a. Per N1-SOP-20, with safety assessment level for DHR <N+1 and temperature of the reactor projected to exceed 140°F, perform a time to boil estimation per N1-ODP-OPS-0108. |
| Distracter: | b. If ready to start first fuel shuffle then communication between Rx. cavity and SFSP is established. Feed and bleed is therefore appropriate but from the Rx. vessel and back to the Rx. vessel <u>NOT</u> from the SFSP and back to the SFSP. |
| Distracter: | c. Hot shutdown equates to reactor water temperature > 212°F. This is not a concern at this time and is not the appropriate action per N1-SOP-20. |
| Distracter: | d. The main difference between refueling and cold shutdown is the reactor mode switch can be in either shutdown or refuel for cold shutdown and must be in refuel for the Refueling Condition. For the cold shutdown condition the reactor mode switch can be placed to startup to perform the shutdown margin demonstration. There is no benefit to returning to cold shutdown and this is not the appropriate action per N1-SOP-20 |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 2 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295021 AA2.04 3.6/3.5 Reactor water temperature
AA2.04 Ability to determine and/or interpret the following as they apply to LOSS OF SHUTDOWN COOLING: Reactor water temperature.

Question Source

- New

PROC

- N1-SOP-20 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

3

SYSID: 21078

Points: 1.00

Assume the design **REFUELING ACCIDENT** as described in UFSAR Chapter XV occurs on Unit One (1).

Which one of the following **EFFECTS OF THE ABOVE EVENT** results in the event being reportable per 10CFR50.72?

- A. Lowering fuel pool level cannot be restored above 338 feet.
- B. Rising Source Range Monitor count rate indicates criticality.
- C. Lowering reactor cavity level causes the uncovering of irradiated fuel.
- D. Rising refuel floor radiation levels cause upscale instrument readings.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 3 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 3 |
| System ID: | 21078 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-234-1-01, EO-1.7.d |

| | |
|-------------|--|
| Answer: | d. The REFUELING ACCIDENT constitutes a dropped irradiated fuel assembly from the highest elevation that it can be dropped from using refueling equipment (~30feet) resulting in the perforation of approximately 105 fuel rods. Rising refuel floor radiation levels result from the fuel damage. EAL Matrix classification 1.4.1, 1.4.2. |
| Distractor: | a. Lowering fuel pool level is not the accident sequence for the REFUELING ACCIDENT. However it is addressed on the EAL Matrix: 1.5.1. |
| Distractor: | b. Inadvertent criticality is not the accident sequence for the REFUELING ACCIDENT. However, it is a concern during refueling and likely that it could be considered to be a refueling accident. |
| Distractor: | c. Lowering reactor cavity and uncover of irradiated fuel is not the accident sequence for the REFUELING ACCIDENT. However it is addressed on the EAL Matrix: 1.5.2 |

References Provided: EAL MATRIX

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 3 Cross References (table item links)

10CFR55

- 43(b)(1)
- 43(b)(4)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.30 2.2/3.6 Knowledge of which events related to system operations/status should be reported to outside agencies
- 295023 Refueling Accidents

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

4

SYSID: 21079

Points: 1.00

The plant was at 100% power when a manual reactor scram was inserted but many control rods failed to insert. Conditions are:

- Bypass valves are controlling reactor pressure
- LP is initiated and injecting
- All RPV injection is prevented, except for CRD and LP
- RPV injection is reestablished with a band of -54 to -90 inches (Fuel Zone)
- Reactor Power is currently 10%
- Reactor pressure is 920 psig

Subsequently, a loss of vacuum occurs.

- ERVs are open
- Torus water temperature is 114°F

Per N1-EOP-3, FAILURE TO SCRAM, which one of the following is the required EOP level control step (indicate the step number) to be performed at this time?

- A. Go to point ③ and perform the actions of step L-7.
- B. Continue at point ③ and perform the actions of step L-9.
- C. Re-enter at point ⑥ and continue the current actions of step L-6.
- D. Re-enter at point ⑦ and continue the current actions of step L-6.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 4 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 4 |
| System ID: | 21079 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-344-1-03, EO-1.2 |

| | |
|-------------|--|
| Answer: | a. ERV opening completes the requirements to enter ⑧. Terminate and prevent injection until ERVs are closed or reactor power is below 6% or RPV level lowers to TAF. |
| Distractor: | b. Based on the conditions provided, this is the step being performed before Torus water temperature exceeds 110°F. |
| Distractor: | c. Overrides are continually evaluated, they are not re-entered, must go to ⑧. |
| Distractor: | d. Overrides are continually evaluated, they are not re-entered, must go to ⑧. |

References Provided: EOP-3

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 4 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 4: Highest order knowledge item requiring use of problem solving skills, judgement, and maximum task complexity as well as applying procedures to determine correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.6 3.1/4 Knowledge symptom based EOP mitigation strategies
- 295025 High Reactor Pressure

Question Source

- Bank

PROC

- N1-EOP-3 Rev. NA
- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

5

SYSID: 21080

Points: 1.00

A steam leak in the drywell has occurred. Primary containment parameters for the past four (4) minutes are as follows:

| | | |
|--------|---------------------|-----------|
| 08:01: | Drywell Pressure | 6.0 psig |
| | Torus Pressure | 5.0 psig |
| | Drywell Temperature | 225°F |
| 08:02: | Drywell Pressure | 8.0 psig |
| | Torus Pressure | 7.0 psig |
| | Drywell Temperature | 250°F |
| 08:03: | Drywell Pressure | 11.0 psig |
| | Torus Pressure | 10.0 psig |
| | Drywell Temperature | 276°F |
| 08:04: | Drywell Pressure | 14.0 psig |
| | Torus Pressure | 13.0 psig |
| | Drywell Temperature | 302°F |

Which one of the following is the EARLIEST TIME at which containment spray can be initiated?

- A. 08:01
- B. 08:02
- C. 08:03
- D. 08:04

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 5 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 5 |
| System ID: | 21080 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-006-344-1-04, EO-1.5

- Answer: b. At 250°F, drywell pressure must be above @7.3 psig to spray. This requirement is met for these conditions. Torus pressure is not used in the spray determination. If use torus pressure would determine still in the "no spray" region and select answer "c" or "d" rather than this answer. Although it could be inferred that although in the safe region of the drywell spray initiation limit, that spray cannot be initiated until torus pressure reaches 13 psig which is a condition requiring containment spray, this is incorrect because required to spray prior to reaching 300°F.
- Distractor: a. At 225°F, drywell pressure must be above @6.8 psig to spray. Torus pressure is not used in the spray determination but could be inadvertently used but should determine still in "no spray" region
- Distractor: c. At 276°F, drywell pressure must be above @7.8 psig to spray. This requirement is not met for drywell pressure but if torus pressure is inadvertently used could determine in "okay to spray" region.
- Distractor: d. At 302°F, drywell pressure must be above @8.4 psig to spray. This requirement is met for these conditions however the "okay to spray" region was entered earlier. Torus pressure is not used in the spray determination. It could be inferred that although in the safe region of the drywell spray initiation limit, that spray cannot be initiated until torus pressure reaches 13 psig which is a condition requiring containment spray,

References Provided: EOP-4

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 5 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295028 EA2.01 4.0*/4.1* Drywell temperature
Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE:
Drywell temperature.

Question Source

- New

PROC

- N1-EOP-04 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

6

SYSID: 21224

Points: 1.00

Following a seismic event:

- RPV blowdown directed
- RPV is depressurized
- Core Spray Pumps 111 and 112 are injecting at 230×10^4 lbm/hr
- RPV level is -124 inches and rising twenty (20) inches/minute
- Drywell pressure is 5 psig
- Torus pressure is 3.5 psig
- Torus temperature is 175°F
- Torus water level is 8.5 feet and is now lowering six (6) inches/minute
- Containment sprays are secured

Which one of the following is the correct DIRECTION regarding Core Spray system flow as level is restored to TAF?

- A. Maintain current injection, flow is near max allowable.
- B. Immediately take action to raise the injection flow.
- C. Immediately lower the injection by 60×10^4 lbm/hr.
- D. Lower the injection by 60×10^4 lbm/hr within 1 minute and no longer.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 6 Details

| | |
|-------------------|---------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 2nd REPLACEMENT 6 |
| System ID: | 21224 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

EOP-2 or EOP-4 Figure N1 (EOP-2) and mitigation strategy for NPSH requirements.
EOP-2 and mitigation strategy for restoring and maintaining level above TAF.

Answer:

b. Matches the K/A because a lowering torus water level affects the EOP mitigation strategy regarding use of core spray (NPSH).

Per EOP FIGURE N1:

$\text{Torus Overpress} = \text{Torus Press} + 0.433(\text{Torus Level} - 4.5)$

$\text{Torus Overpress} = 3.5 + 0.433(8.5 - 4.5)$

$\text{Torus Overpress} = 3.5 + 0.433(4)$

$\text{Torus Overpress} = 3.5 + 1.7 = 5.2 \text{ psig}$
for 8.5 feet torus level

$\text{Torus Overpress} = 3.5 + 1.5 = 5.0 \text{ psig}$
for 8 feet torus level

So, the 5 psig curve is used on Detail N1 (EOP-2) for the next one (1) minute at which point RPV level is at -104 inches. With two subsystems available, the max flow is about 460.

Distractor:

a. They may incorrectly determine the one-subsystem value is to be used not two while using the correct curve, resulting in flow being very close to the limit.

Distractor:

c. They may determine the one-subsystem value is to be used not two, and incorrectly apply the 0 psig curve rather than the 5 psig for torus water level for the current time requiring a reduction in flow rate.

Distractor:

d. They may determine the one-subsystem value is to be used not two, and incorrectly apply the 0 psig curve rather than the 5 psig for torus water level one minute later. The torus water level one minute later still permits using the 5 psig curve.

References Provided: EOP-2, EOP-4

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 6 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.6 3.1/4 Knowledge symptom based EOP mitigation strategies
- 295030 Low Suppression Pool Water Level

Question Source

- New

PROC

- N1-EOP-2 Rev. NA
- N1-EOP-4 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

7

SYSID: 21225

Points: 1.00

Given the following conditions during an emergency:

- One (1) control rod is at position 48
- RPV level at -105 inches (fuel zone) and lowering at six (6) inches per minute
- Preferred injection systems cannot be started
- Alignment of alternate injection systems has been directed but none of the these systems are reported as aligned
- It is expected that containment spray raw water valved to core spray will be aligned in three (3) minutes

Which one of the following is the correct EOP to be executed at this time based on the above conditions?

- A. EOP-2 is required.
- B. EOP-7 is required.
- C. EOP-8 is required.
- D. EOP-9 is required.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 7 Details

| | |
|-------------------|---------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 2nd REPLACEMENT 7 |
| System ID: | 21225 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | EOP-2; L-14 and L-15 |

Answer: d. Under the conditions presented, steam cooling (EOP-9) is required (EOP-2 L-14 and L-15). In the steam cooling RPV blowdown will be required in the next 2 minutes (-121 inches) before the alternate injection system is aligned.

Distractor: a. EOP-2 is exited because no injection sources are aligned with a pump running. EOP-9 is entered. Plausible because the candidate may determine that it is okay to defer blowdown and steam cooling while the alternate injection system is aligned. Also plausible because EOP-8 requires re-entry into EOP-2 after the blowdown is performed.

Distractor: b. EOP-7, RPV flooding is not required because there is no reason to believe that RPV water level is not known. The indicated RPV water level is valid and even if the candidate believes they are in EOP-3 (ATWS) RPV level is still valid since reactor power level would be less than 6% for the control rod position specified.

Distractor: c. If the candidate determines that EOP-3 is appropriate and EOP is exited based on the control rod positions then RPV blowdown is appropriate. However, EOP-3 is not entered because the reactor will remain shutdown under all conditions without boron based on the shutdown margin definition and bases for EOP-2 Step 3.

References Provided: EOP-2, EOP-3, EOP-7, EOP-8

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 7 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295031 EA2.04 4.6*/4.8* Adequate core cooling
Ability to determine and/or interpret the following as they apply to REACTOR LOW WATER LEVEL

Question Source

- New

PROC

- N1-EOP-2 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

8

SYSID: 21083

Points: 1.00

The plant is operating at 100% power when the Fire Detection System senses a fire in Hazard C-2123, Power Board Room 102. The following Alarm Detection Zones are received at the Main Fire Control Panel:

- DX-2123A
- DX-2123B

An AO reports:

- Local horn and light actuate
- Thirty (30) seconds later CO2 discharges into the area

In response to the above conditions, which one of the following is required at this time?

- A. Direct the CSO to implement EPIP-EPP-28, Attachment 1, CSO Fire Fighting Checklist.
- B. Declare an unusual event per EAL 8.2.1 and enter EPIP-EPP-18, Activation and Direction of the Emergency Plans.
- C. Dispatch a single fire brigade member to the alarm location to verify the fire condition before dispatching the fire brigade.
- D. Direct the CSO to immediately scram the reactor because the ability to establish the safe shutdown condition is lost.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 8 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 8 |
| System ID: | 21083 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-286-1-05, EO-1.7.d

EPIP-EPP-28, 3.2.1.a, 4.1

Answer: a. When credible evidence exists of a fire condition within the protected area, then per EPIP-EPP-28, direct the CSO to implement the CSO fire fighting checklist.

The definition of CONFIRMED FIRE is a condition in which credible evidence exists that a fire is actually occurring. A fire may be considered as confirmed given any of the following: fire alarm/annunciator AND suppression system activation accompanied by actual flow or discharge, or Fire Brigade/Leader report, or SSS judgement.

Distractor: b. An unusual event is not declared until confirmed fire not extinguished within 15 minutes of control room notification. There is no evidence that the fire is not extinguished and 15 minutes have not expired.

Distractor: c. This is the correct action if alarms are not associated with the actuation of an automatic suppression system within the protected area. Because automatic suppression occurred, the fire brigade (not just a single member) is dispatched to the scene.

Distractor: d. Per N1-SOP-21.1, if either of the following conditions exist due to the fire: spurious valve operation or loss of equipment control or fire not under control within 15 minutes or fire endangers safe shutdown capability, the initiate a reactor scram and enter SOP-1 and EOP-2. None of these conditions are met or can be determined conclusively at this time.

References Provided: EAL Matrix

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 8 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.2 3/4 Knowledge of operator responsibilities during all modes of plant operation
- 600000 Plant Fire On Site

Question Source

- New

PROC

- EPIP-EPP-28 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

9

SYSID: 21084

Points: 1.00

A reactor startup is in progress. N1-ST-C2, Solenoid-Actuated Pressure Relief Valves Operability And Flow Verification Test will be performed. Torus average temperature prior to the start of the test is 82°F.

Which one of the following is the threshold torus average temperature that if exceeded during the test requires declaring the Tech Spec LCO Statement NOT met and entering a TS Action Statement?

- A. 85°F.
- B. 90°F.
- C. 92°F.
- D. 95°F.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 9 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 9 |
| System ID: | 21084 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-226-1-01, EO-1.11 |

| | |
|-------------|--|
| Answer: | d. Per TS 3.3.2.d, during testing of relief valves that add heat to the torus the operating limit of 85°F is raised 10°F to 95°F. |
| Distractor: | a. This is the normal operating limit without testing of relief valves that add heat to the torus. The operating limit of 85°F is raised 10°F to 95°F during this testing. |
| Distractor: | b. Could add 5°F to the operating limit and determine the limit to be 90°F. The 5°F value could be confused with the requirement to monitor torus water temperature every 5 minutes during the test. |
| Distractor: | c. The operating limit is raised 10°F to 95°F during this testing. Could add 10°F to the starting temperature and determine the limit to be 92°F. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 9 Cross References (table item links)

10CFR55

- 43(b)(2)

Cognitive Level

- 1

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.22 3.4/4.1 Knowledge of limiting conditions for operations and safety limits
- 295013 High Suppression Pool Temp

Question Source

- New

TECHSPEC

- 3.3.2.D Rev.

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

10

SYSID: 21208

Points: 1.00

Given the following at 100% power:

00:00 Reactor vessel instrument 36-07A fails high.
Reactor power remains at 100% power and is stable.
NO operator actions have been taken.

Which one of the following is the correct action in response to the above failure?

- A. Reactor coolant pressure shall be reduced to 110 psig or less within 10 hours.
- B. Restore the instrument to operable status within 12 hours or insert all control rods.
- C. Ensure one instrument channel for two separate parameters are each tripped within 12 hours.
- D. Ensure one instrument channel is tripped within 12 hours and a different instrument channel is tripped within 24 hours.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 10 Details

| | |
|-------------------|-------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #10 |
| System ID: | 21208 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

TS 3.6.2.a and Table 3.6.2.a and Table 3.6.2.b
C-18015-C

Answer:

c. Using drawing C-18015-C, determine the affected condition and action: vessel pressure (H) – Scram Reactor and vessel pressure (L) – Close MSIVs (run mode only). TS 3.6.2.a and Table 3.6.2.a (parameter 2) are to be referenced for the high reactor pressure scram function. TS 3.6.2.b and Table 3.6.2.b (parameter 5) are to be referenced for the low main steam line pressure function. Per TS 3.6.2.a and Table 3.6.2.a (parameter 2) the minimum number of operable instrument channels per operable trip system is required to be 2 but one channel is inoperable and the requirement is not met. Therefore reference note "o" for the applicable action. Per note "o" with one channel required by Table 3.6.2.a inoperable in one or more parameters, place the inoperable channel and/or that trip system in the tripped condition* within 12 hours. Per plant design the channel automatically tripped causing a ½ scram on RPS channel 11 when the instrument failed upscale so the channel is already in the tripped condition. *An inoperable channel need not be placed in the trip condition where this would cause the trip function to occur, but in these cases if the inoperable channel is not restored to operable status within the required time the action required by 3.6.2.a for the parameter shall be taken. **Per 3.6.2.a(1) action this requires the control rods to be inserted if not restored to operable status within 12 hours. (Distracter b).** Per TS 3.6.2.b and Table 3.6.2.b (parameter 5) the minimum number of operable instrument channels per operable trip system is required to be 2 but one channel is inoperable and the requirement is not met. Therefore reference note "f" for the applicable action. **Per note "f" with one channel required by Table 3.6.2.b inoperable in one or more parameters, place the inoperable**

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

channel and/or that trip system in the tripped condition within 12 hours for parameters common to scram instrumentation and 24 hours for parameters not common to scram instrumentation (distracter d.). This instrument is common to scram instrumentation. Because the instrument failed upscale and not downscale a MSIV ½ isolation is not present and action must be taken. An option is to take action required by 3.6.2.a any time within the 12 hours because this is instrumentation common to reactor scram and must be taken before the 12 hours expires. The option is per 3.6.2.a(2) action is the MSIVs must be closed or the valves shall be considered inoperable and TS 3.2.7 and 3.2.4 shall apply. Allows four additional hours to close one MISV in the affected line.

Distractor:

a. This is the action required if it is incorrectly determined that the pressure relief function is affected rather than the high pressure reactor scram and MSIV functions or determined in addition to these functions. Per TS 3.1.5 (ADS function) and TS 3.2.9 (pressure relief function) for an inoperable ERV which did not open when required (instrument failed high) then one ERV is inoperable and a 10 hour shutdown would be required.

Distractor:

b. *An inoperable channel need not be placed in the trip condition where this would cause the trip function to occur, but in these cases if the inoperable channel is not restored to operable status within the required time the action required by 3.6.2.a for the parameter shall be taken. Per **3.6.2.a(1) action this requires the control rods to be inserted if not restored to operable status within 12 hours. (Distracter b).**

Distractor:

d. Per TS 3.6.2.b and Table 3.6.2.b (parameter 5) the minimum number of operable instrument channels per operable trip system is required to be 2 but one channel is inoperable and the requirement is not met. Therefore reference note "F" for the applicable action. **Per note "F" with one**

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

channel required by Table 3.6.2.b inoperable in one or more parameters, place the inoperable channel and/or that trip system in the tripped condition within 12 hours for parameters common to scram instrumentation and 24 hours for parameters not common to scram instrumentation (distracter d.).

References Provided: DRAWING C-18015-C, TS 3.1.5, TS 3.2.9, TS 3.6.2.A, 3.6.2.B

Question 10 Cross References (table item links)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

DRW

- C-18015-C Rev. NA

NUREG 1123 KA Catalog Rev. 2

- G2.2.22 3.4/4.1 Knowledge of limiting conditions for operations and safety limits
- 295007 High Reactor Pressure

Question Source

- New

TECHSPEC

- 3.6.2.A Rev.
- 3.6.2.B Rev. na
- TABLE 3.6.2a. Rev. NA.

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

11

SYSID: 21086

Points: 1.00

The plant is at 100% power with fuel leaks identified:

15:00 K1-1-2, EMER COND VENT 11 RAD MONITOR, alarms
15:01 EMERG COND RMON 111 and 112 on J panel are both in alarm
15:02 CRS directs EC 11 be isolated but it CANNOT be isolated
15:05 EMERG COND RMON 111 and 112 are steady at 28 mrem/hr
15:06 Manual reactor scram inserted
15:07 EMERG COND RMON 111 and 112 are at 15 mrem/hr and lowering slowly

Which one of the following is the required action AT THIS TIME?

- A. Cooldown at a rate below 100°F/hr as directed by EOP-2.
- B. Cooldown at a rate above 100°F/hr as directed by EOP-2.
- C. Perform a RPV Blowdown per EOP-8 as directed by EOP-5.
- D. Perform a RPV Blowdown per EOP-8 as directed by EOP-6.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 11 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 11 |
| System ID: | 21086 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-207-1-01, EO-1.8.b

Answer:

a. Reduce reactor pressure to lower the release. No conditions present at this time that warrant actions beyond a normal cooldown.

Distractor:

b. Acceptable to exceed 100°F/hr if anticipating emergency depressurization. Conditions do not warrant exceeding the TS cooldown rate at this time. If the radiation monitor readings continued to rise, then it might be reasonable to determine that alert release rate would be exceeded and higher (site area emergency and general emergency) classifications may be challenged. RPV blowdown is anticipated. As conditions which will require a blowdown are approached it is appropriate to rapidly reject as much heat energy as possible from the RPV to a heat sink other than the torus. Such action preserves the heat capacity of the torus for as long as possible, until a requirement for a blowdown actually exists. "Anticipated" implies an expectation, based on an evaluation of plant conditions and extrapolation of parameter trends, that a blowdown requirement will soon be reached and cannot be averted by actions prescribed in the EPGs. Before this conclusion can be drawn, however, the effectiveness of the steps preceding the blowdown requirement must be evaluated. For example, if drywell temperature is increasing, a blowdown should not be "anticipated" in the Drywell Temperature branch of EOP-4 until the steps addressing operation of drywell cooling and drywell sprays have been performed.

Distractor:

c. EOP-5 is likely entered based on "shine" causing ARM on west end of shield wall 340' elevation to exceed the EOP-5 entry set point. However, a primary system is not discharging into the reactor building. It is discharging outside the reactor building, therefore, cannot achieve blowdown requirement from EOP-5 based on the conditions presented.

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Distractor: d. EOP-6 is not entered until the ALERT level is achieved within the e-plan. Both radiation monitors rise above the unusual event level and challenge the alert release level then lower when the reactor is scrammed. Additionally, because this is an unmonitored release, need field survey data before determining a blowdown required per EOP-6.

References Provided: EOP-2, EOP-5/6

Question 11 Cross References (table item links)

10CFR55

- 43(b)(4)
- 43(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 4: Highest order knowledge item requiring use of problem solving skills, judgement, and maximum task complexity as well as applying procedures to determine correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295017 AA2.01 2.9*/4.2* Off-site release rate: Plant-Specific
AA2.01 Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE : Off-site release rate.

Question Source

- New

PROC

- N1-EOP-02 Rev. NA
- N1-EOP-05 Rev. NA
- N1-EOP-06 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

12

SYSID: 21203

Points: 1.00

The plant is at power when the following occur:

- A leak occurs in the Reactor Water Cleanup System
- Cleanup 33-01 is closed (CU RETURN ISOLATION VALVE I)
- Cleanup 33-02 will not close (CU SUPPLY ISOLATION VALVE II)
- Cleanup 33-04 will not close (CU SUPPLY ISOLATION VALVE I2)
- Cleanup Pump area temperature is 191°F
- Cleanup Pump area radiation level is 9 Rem/hr

Based on the above conditions, which one of the following is the correct action at this time?

- A. Initiate a normal shutdown per OP-43C, Section G as required by EOP-5.
- B. Initiate a 10-hour shutdown per OP-43C, Section H.1.0 as required by Tech Specs.
- C. Scram the reactor. An RPV Blowdown per EOP-8 is not required.
- D. Scram the reactor. Immediately enter EOP-8, RPV Blowdown.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 12 Details

| | |
|-------------------|-------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #12 |
| System ID: | 21203 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

N1-EOP-5

Technical Specifications 3.2.7

N1-ODP-OPS-0305, EOP Bases Document

Answer:

c. Cleanup is not isolated; therefore there is a primary system discharging into the reactor building. 33-01 and a check valve are the isolations for the return to the RPV and 33-02 and 33-04 are the isolations for the supply from the RPV.

A scram is required before an area is above Max Safe.

Distractor:

a. If it is incorrectly determined that Cleanup is isolated, then this path in EOP-5 includes this action. However, this action is not correct because cleanup did not isolate and because if it had isolated and this path was entered, two area are not above max safe for the same parameter as required. I.e., two area temperatures or two area radiation levels above max safe not one area temperature and one area radiation level above max safe.

Distractor:

b. Technical Specifications 3.2.7, Reactor Coolant Isolation Valves requires a shutdown within be initiated with 1 hour and completed within 10 hours. For this shutdown the reactor is not scrammed until above 7 hours into the shutdown. A reactor scram is required based on the conditions presented.

Distractor:

d. RPV Blowdown is not required until a second area is above Max Safe for the same parameter. I.e., two area temperatures or two area radiation levels above max safe not one area temperature and one area radiation level above max safe).

References Provided: EOP-5

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 12 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 295033 EA2.01 3.8/3.9 Area radiation levels

Question Source

- New

PROC

- N1-EOP-5 Rev. NA
- N1-ODP-OPS-0305, Rev. NA

TECHSPEC

- 3.2.7 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

13

SYSID: 21088

Points: 1.00

The plant is at 100% power with the following inoperable equipment:

- EC 11 is not restored to operable status within the 7 days permitted by TS 3.1.3.b.
- At 12:00 you enter the action of TS 3.1.3.e which states "a normal orderly shutdown shall be initiated within one hour, and the reactor shall be in the cold shutdown condition within 10 hours."
- At 12:30, recirc flow has been reduced to 41×10^6 lbm/hr, cram rods have been inserted, and the crew has commenced inserting control rods per the Control Rod Sequence.

Which one of the following actions is required to achieve cold shutdown as required by TS 3.1.3.e without violating any procedure or TS limits?

- A. Insert a manual scram no later than 15:00 and establish Shutdown Cooling permissives no later than 19:00.
- B. Insert a manual scram no later than 15:30 and establish Shutdown Cooling permissives no later than 21:00.
- C. Authorize cool down rates up to 100°F/hr to avoid a reactor scram and establish shutdown cooling permissives no later than 19:30.
- D. Authorize cool down rates up to 100°F/hr to avoid a reactor scram and establish shutdown cooling permissives no later than 22:00

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 13 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 13 |
| System ID: | 21088 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-006-APS-1-01, EO-1.2 and O1-OPS-008-362-1-03, EO-1.11 |

N1-OP-43C, D.19

| | |
|-------------|--|
| Answer: | a. When required to shutdown and cool down to meet a 10-hour LCO requirement, it is necessary insert a manual scram approximately 3 hours into the LCO. It is also necessary to have SDC permissives met approximately 7 hours into the LCO to achieve cold shutdown in 10 hours. |
| Distractor: | b. SDC at 21:00 only leaves 1 hour to reduce temperature about 140 degrees exceeding the cooldown rate. The scram is to occur within 3 hours of the TS3.1.3.e entry, not the 12:30 conditions stated |
| Distractor: | c & d, cold shutdown cannot be achieved within 10 hours without performing the reactor scram to accelerate the shutdown. Without a manual reactor scram, limits would be violated to meet the 10-hour requirement. Raising the cooldown rate above the administrative limit up to the TS limit does not aid in obtaining cold shutdown within 10 hours of entering TS 3.1.3.e. |

References Provided: None

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 13 Cross References (table item links)

10CFR55

- 43(b)(5)
- 43(b)(6)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.22 3.4/4.1 Knowledge of limiting conditions for operations and safety limits
- 207000 Isolation (Emergency) Condenser

Question Source

- New

PROC

- N1-OP-43C Rev. NA

TECHSPEC

- 3.1.3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

14

SYSID: 21089

Points: 1.00

Unit One (1) is at 100% power. At 08:00 (12/1/2004), K1 2-1, LIQ POISON EXPLOSIVE VALVE 11-12 CONTINUITY, alarms. The following are verified for the Liquid Poison (LP) System:

- LP System 11 explosive valve light on Panel K is OFF.
- LP System 11 ammeter located at 1S-65 indicates 0 milliamps
- LP System 12 explosive valve light on Panel K is ON.
- LP System 12 ammeter located at 1S-65 indicates 0.95 milliamps.

Per Technical Specifications, which one of the following is a required action in response to the conditions above?

- A. Initiate an orderly shutdown no later than 09:00 on 12/1/2004
- B. Complete N1-ST-M1B, Liquid Poison Pump 12 Operability Test, no later than 08:00 on 12/2/2004.
- C. Immediately verify the redundant component is operable and verify it remains operable once every 24 hours thereafter.
- D. Immediately verify the liquid poison solution parameters are within the equivalency equation and TS Figure 3.1.2.b.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 14 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 14 |
| System ID: | 21089 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-001-211-1-01, EO-1.11

Answer:

c. Per TS 3.1.2.b, if a redundant component becomes inoperable, specification 3.1.2.a shall be considered fulfilled, provided that the component is returned to an operable condition within 7 days and the additional surveillance required is performed.

Per the TS bases, the explosive valves are considered redundant components. The functional test and other surveillances on components, along with monitoring instrumentation, demonstrates system operability. The continuity check of the firing circuit on the explosive valves is one of the means to ensure system operability. Per Technical Specification 4.1.2.c, SURVEILLANCE WITH INOPERABLE COMPONENTS, when a component becomes inoperable its redundant component shall be verified to be operable immediately and daily thereafter.

TS 3.1.2.b actions apply because the explosive valve is a redundant component. The TS requirement is to restore it to operable in 7 days and to immediately check the redundant component (the other explosive valve) immediately and then daily until the LCO statement is met.

Distractor:

a. TS 3.1.2.b actions apply because the explosive valve is a redundant component. If not a redundant component, then TS 3.1.2.e actions would be entered.

Distractor:

b. Monthly surveillance only tests the pump and not the explosive valve. The requirement is to test the redundant component. Additionally, the monthly surveillance results in LP System 12 being inoperable and a TS 3.0.1 entry which is not prudent; intentional entry into TS 3.0.1 is prohibited.

Distractor:

d. The solution parameters are not required to be verified; only the redundant component. If both valves inop, then this would be required.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 14 Cross References (table item links)

10CFR55

- 43(b)(2)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.25 2.5/3.7 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits
- 211000 SLC

Question Source

- New

TECHSPEC

- 3.1.2 Rev. NA
- 3.1.2b Rev.
- 4.1.2.c, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

15

SYSID: 21090

Points: 1.00

Phase II core shuffle in progress.

- The next step (step 226) requires movement of the fuel assembly at core location 28-19 to core location 24-39.
- Before latching step 226, SRM 11 and SRM 13 are declared inoperable.

Which one of the following statements is correct in response to the above conditions?

- A. The fuel assembly would be moved to a core quadrant with an inoperable SRM.
- B. The fuel assembly would be removed from a core quadrant with an inoperable SRM.
- C. An SRM must be operable in each of the four (4) core quadrants when core alterations are in progress.
- D. An SRM must be operable in one (1) of the core quadrants adjacent to the locations of the core alterations.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 15 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 15 |
| System ID: | 21090 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-234-1-01, EO-1.11, EO-1.7.d |

Answer: d. Per Tech Spec 3.5.3.b, 3 SRMs are required to be operable for core alterations. One in the quadrant where fuel is being moved and one in an adjacent quadrant. Operable SRM is required in the quadrant where the core alteration occurs and in an adjacent quadrant. The fuel assembly at core locations 28-19 is in the SE quadrant that contains operable SRM 14. It will be moved to core location 24-39, which is in the NW quadrant that contains operable SRM 12. However, an SRM in an adjacent quadrant must also be operable (either SRM 11 or SRM13)

Distractor: a. The fuel assembly will be moved to core location 24-39, which contains operable SRM 12.

Distractor: b. The fuel assembly at core location 28-19, contains operable SRM 14.

Distractor: c. Per Tech Spec 3.5.3.b: SRMs are required to be operable in the quadrant where fuel is being moved and in an adjacent quadrant. All four SRMs are not required to be operable. If full core offload or reload then 4 SRMs are required.

References Provided: CORE MAP

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 15 Cross References (table item links)

10CFR55

- 43(b)(2)
- 43(b)(6)
- 43(b)(7)

Cognitive Level

- 3

Difficulty Level

- Level 4: Highest order knowledge item requiring use of problem solving skills, judgement, and maximum task complexity as well as applying procedures to determine correct answer.

NUREG 1123 KA Catalog Rev. 2

- 215004 A2.02 3.4/3.7 SRM inop condition

Ability to (a) predict the impacts of the following on the SOURCE RANGE MONITOR (SRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those abnormal conditions or operations: SRM inop condition.

Question Source

- New

PROC

- N1-FHP-27C Rev. NA

TECHSPEC

- 3.5.3.b. Rev. NA

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

16

SYSID: 21207

Points: 1.00

The plant is at 90% power. A grid disturbance causes the following conditions:

- FREQUENCY at 58.8 hz, VOLTAGE at 113.6 KV
- Computer points F432, F433, F434 indicate 113.6 KV
- Load flow computer not available

Which one of the following is the LATEST time that this event is to be reported to the NRC?

- A. Within 15 minutes of discovery of the degraded conditions.
- B. Within 15 minutes of initiating the most limiting Tech Spec action.
- C. Within 4 hours of discovery of the degraded conditions.
- D. Within 4 hours of initiating the most limiting Tech Spec action.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 16 Details

| | |
|-------------------|-------------------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #16 |
| System ID: | 21207 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | TS 3.6.3 10CF50.72 NUREG 1022 |

Answer: d. Per 10CFR50.72, initiation of a plant shutdown required by TS is a 4-hour report. However, this clock starts when the plant shutdown is actually initiated, not when the TS action for the required plant shutdown is entered as outlined in NUREG 1022, Rev 2, specific reporting criteria section 3.2.1. For the conditions presented both offsite circuits are inoperable requiring the initiation of a plant shutdown within one hour. The report is required within 4 hours of initiation of this TS required plant shutdown, which is the limiting Tech Spec action.

Distractor: a. There is no requirement met for an emergency plan classification based on these conditions. For the purpose of emergency classification offsite power is not lost. If it is incorrectly determined that offsite power is lost then the incorrect determination could be made.

Distractor: b. The report is a 4-hour report not a 15-minute report that starts from when the limiting Tech Spec action is initiated.

Distractor: c. The 4-hour report is the correct time to be applied for these conditions however the time is incorrectly applied to the initiating event – declaring both offsite circuits inoperable – not the initiation of the Tech Spec required shutdown.

References Provided: TS 3.6.3, 10CFR50.72

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 16 Cross References (table item links)

10CFR55

- 43(b)(1)

CFR

- 10CFR50.72 Rev. NA

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.30 2.2/3.6 Knowledge of which events related to system operations/status should be reported to outside agencies
- 262001 AC Electrical Distribution

OTHER REFS

- (GUIDE) NUREG 1022, Rev. NA

Question Source

- New

TECHSPEC

- 3.6.3 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

17

SYSID: 21204

Points: 1.00

Given the following:

- Upon completion of a 5 day forced outage, control rod withdrawal for the subsequent startup has been commenced using control rod sequence A2.
- When control rod 30-27 is being withdrawn, a RWM ERROR alarm is received at the E Panel and is also printed on the alarm typer.
- Control rod 30-27 motion is stopped at position 24.

Which one of the following is the correct action in response to the above conditions?

- A. Bypass the RWM and continue control rod withdrawal since additional staff is NOT required to be stationed.
- B. Bypass the RWM and station an additional RO or SRO to verify control rod movements before continuing the startup.
- C. Fully insert this control rod then the previously withdrawn control rods in reverse order since continuing the startup is prohibited.
- D. Contact Reactor Engineering to perform a change in the loaded control rod sequence per N1-REP-20, Control Rod Sequence Exchange.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 17 Details

| | |
|-------------------|-------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #17 |
| System ID: | 21204 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

N1-OP-37

TS 3.1.1.b(3)(b)

Control Rod Sequence Sheet for RWM Group 1

Answer:

c. A RWM error alarm indicates a problem with the RWM; a rod block will be generated. There is a fault within the RWM input buffer or output buffer. If there was a sequence loading error the control rod motion would have been interrupted before reaching position 24. With the RWM failure it is inoperable. Since the first 12 control rods of the control rod sequence are not completely withdrawn, control rods shall be inserted in reverse order. The control rod whose motion is stopped at position 24 (control 30-27) is the 12th rod but must be at position 48 to continue the startup. If the first 12 control rods were fully withdrawn, then control rod withdrawal could continue per TS. Also since the startup requires additional personnel in the control room for the startup including verification of control rod movements, the TS requirement for additional personnel to verify rod movements is already met and additional staff is not required.

Distractor:

a. Since the first 12 control rods of the control rod sequence are not completely withdrawn, control rods shall be inserted in reverse order. If the first 12 control rods were fully withdrawn, then control rod withdrawal could continue per TS. Also since the startup requires additional personnel in the control room for the startup including verification of control rod movements, the TS requirement for additional personnel to verify rod movements is already met and additional staff is not required.

Distractor:

b. Since the first 12 control rods of the control rod sequence are not completely withdrawn, control rods shall be inserted in reverse order. If the first 12 control rods were fully withdrawn, then control rod withdrawal could continue per TS. Also since the startup requires additional personnel in the control room for the startup including verification of control rod

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Distractor: movements, the TS requirement for additional personnel to verify rod movements is already met and additional staff is not required.

d. A RWM error alarm indicates a problem with the RWM; a rod block will be generated. There is a fault within the RWM input buffer or output buffer. If there was a sequence loading error the control rod motion would have been interrupted before reaching position 24 and a SELECT ERROR would have been received. Procedure N1-REP-20, Control Rod Sequence Exchange, is for control rod sequence exchanges at power.

References Provided: CONTROL ROD SEQUENCE SHEETS FOR RWM GROUPS 1-4, TS 3.1.1.B. (PAGES 31-33)

Question 17 Cross References (table item links)

10CFR55

- 43(b)(6)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- 201006 A2.07 2.5/2.8 RWM hardware/software failure: P-Spec(Not-BWR6)

Question Source

- New

PROC

- N1-OP-37 Rev. NA

TECHSPEC

- 3.1.1.b Rev.

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

18

SYSID: 21093

Points: 1.00

During plant operations at 100% power high temperatures have occurred in the Reactor Building. A temporary cooler has been brought into the Reactor Building Track Bay and the Inner Track Bay Door opened

When N1-ST-C5, SECONDARY CONTAINMENT AND REACTOR BUILDING EMERGENCY VENTILATION SYSTEM OPERABILITY TEST is performed to check the Reactor Building to Yard Outside Airlock Swing Away Door (Peele Door) the following data is recorded:

- Wind Speed at 30 feet 10 mph
- Rx Bldg to Atmos dP -0.27 inches H₂O
- RBEV flow as indicated on 202-49B 1590 cfm

Regarding this specific data and Technical Specification 3.4.1 which one of the following actions is required?

- A. Continue plant operations, but the test must be run again when wind speed is below 5 mph.
- B. Within 4 hours close the inner door and verify reactor building leakage is restored to within Tech Spec limits.
- C. Operate the temporary cooler for 3 hours to lower building temperatures then run the surveillance again.
- D. Notify plant management of the test failure and initiate actions to perform a normal plant shutdown within 4 hours.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 18 Details

| | |
|-------------------|---|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 18 |
| System ID: | 21093 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-223-1-03, EO-1.11 |

Answer: b. This test is designed to measure reactor building in-leakage. The test was not successful and reactor building leakage must be established within limits within 4 hours, the inner door must be closed.

Distractor: a. The surveillance was NOT successful, action must be taken within 4 hours to restore secondary containment.

Distractor: c. Running the coolers may lower temperatures in the reactor building but they won't help a leaking door. Of the choices provided only b. is required.

Distractor: d. The conditions required by T.S. 4.4.1 were NOT met but can be restored by closing the inner door, a shutdown should NOT be performed.

References Provided: Technical Specifications 3.4.1 including Figure 3.4.1

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 18 Cross References (table item links)

10CFR55

- 43(b)(2)

Cognitive Level

- 3

DER

- NM-2004-2971, Rev. NA

Difficulty Level

- Level 4: Highest order knowledge item requiring use of problem solving skills, judgement, and maximum task complexity as well as applying procedures to determine correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.33 3.4/4 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications
- 290001 Secondary CTMT

Question Source

- Bank

PROC

- N1-ST-C5 Rev. NA

TECHSPEC

- 3.4.1 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

19

SYSID: 21094

Points: 1.00

With the plant at 100% power, you discover the last performance of N1-ST-M1A, Liquid Poison Pump 11 Operability Test, was completed thirty-five (35) days ago.

Which one of the following is the implication of this discovery?

- A. The surveillance interval of TS SR 4.0.2 is NOT exceeded and the LCO is still met. TS SR 4.0.3 does not apply.
- B. The surveillance interval of TS SR 4.0.2 is exceeded and the applicable tech spec actions must be entered. TS SR 4.0.3 does not apply.
- C. TS SR 4.0.3 applies for a missed ST. The LCO must be declared not met and the applicable tech spec actions entered.
- D. TS SR 4.0.3 applies for a missed ST. Declaring the LCO statement not met can be delayed up to 24 hours to perform the test.

Answer: A

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 19 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 19 |
| System ID: | 21094 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-008-362-1-03, EO-1.1 |

GAP-PSH-02, 4.4

- Answer: a. Although the "monthly" interval of 31 days is exceeded, the surveillance interval of TS SR 4.0.2 (extension not to exceed 25%) is not exceeded. This equates to 38.75 days. The LCO is still met and adequate time exists to complete the surveillance.
- Distractor: b. The surveillance interval of 38.75 days is not exceeded. If not aware of a 25% extension, then would determine surveillance interval is exceeded and may declare the LCO not met rather than declare the surveillance missed.
- Distractor: c. TS SR 4.0.3 applies if a surveillance is missed which is not the case. The surveillance remains within the specified interval. If TS SR 4.0.3 did apply, then declaring the LCO not met can be delayed from the time of discovery up to 24 hours to perform the ST.
- Distractor: d. TS SR 4.0.3 applies if a surveillance is missed which is not the case. The surveillance remains within the specified interval.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 19 Cross References (table item links)

10CFR55

- 43(b)(1)

Cognitive Level

- 2

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.1.10 2.7/3.9 Knowledge of conditions and limitations in the facility license

Question Source

- New

PROC

- GAP-PSH-02 Rev. NA

TECHSPEC

- 4.0.2, Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

20

SYSID: 21205

Points: 1.00

The plant was at 100% with Cleanup removed from service for maintenance. When the maintenance was complete:

- Reactor power was lowered.
- Cleanup was returned to service with one pump in operation.
- Reactor power was returned to 1850 Mwth using computer point C875, NSSS CTP.

One (1) hour later, you request an OD-3 Option 2 (attached). Evaluate the plant conditions based on this process computer report.

- A. The heat balance is inaccurate. Actual reactor power is LOWER than 1850 Mwth.
- B. The heat balance is inaccurate. Actual reactor power is HIGHER than 1850 Mwth.
- C. The heat balance is accurate. However, main generator output is HIGHER than when Cleanup was shutdown.
- D. The heat balance is accurate. However, main generator output is LOWER than when Cleanup was shutdown.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 20 Details

| | |
|-------------------|-------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #20 |
| System ID: | 21205 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

N1-EOP-3, N1-REP-1, N1-REP-8

Answer:

b. Per N1-OP-3, D.8.0, Failure to verify NSSS computer points in service following cleanup system lineup changes may result in invalid inputs to the core thermal power calculation. Per N1-OP-3, if the reactor is operating at power, then verify cleanup flow and thermal power input to the Core Thermal Power heat balance are accurate for the indicated parameters following changes in cleanup system alignments. Evaluation of the OD-3 Option 2 report shows the cleanup input value for the heat balance remained at zero but should have automatically updated to indicate one pump in service. With this value at zero rather than at the expected value, and with reactor power adjusted to computer point C875, the actual reactor power is HIGHER than 1850 Mwth indicated on C875. License thermal power limit of 1850 Mwth is being exceeded.

Distractor:

a. With this value at zero rather than at the expected value, and with reactor power adjusted to computer point C875, the actual reactor power is HIGHER than 1850 Mwth indicated on C875 not lower.

Distractor:

c. With this value at zero rather than at the expected value, and with reactor power adjusted to computer point C875, the actual reactor power is HIGHER than 1850 Mwth indicated on C875. License thermal power limit of 1850 Mwth is being exceeded.

Distractor:

d. With this value at zero rather than at the expected value, and with reactor power adjusted to computer point C875, the actual reactor power is HIGHER than 1850 Mwth indicated on C875. License thermal power limit of 1850 Mwth is being exceeded. Main generator output would be higher not lower.

References Provided: OD-3 Option 2/CTP LOG

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 20 Cross References (table item links)

10CFR55

- 43(b)(2)
- 43(b)(5)

Cognitive Level

- 2

NUREG 1123 KA Catalog Rev. 2

- G2.1.19 3/3 Ability to use plant computer to obtain and evaluate parametric information on system or component status

Question Source

- New

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

21

SYSID: 21096

Points: 1.00

A Type 1 Procedure Change Evaluation (PCE) was generated for a Unit One (1) Operating Procedure. The Technical Verifier, QTR Review, and RPO Review are complete.

Per NIP-PRO-04, Procedure Change Evaluations and Future Procedure Enhancements, which one of the following "approvals" satisfies ALL approval requirements to consider this PCE complete?

- A. SM or CRS approves the PCE before implementing it. No other approval is required to consider this PCE complete.
- B. Manager Operations or GSO approves the PCE within 14 days of its performance. No other approval is required to consider this PCE complete.
- C. CRS approves the PCE before implementing it AND GSO approves the PCE within 14 days of the CRS approval. No other approval is required to consider this PCE complete.
- D. WEC SRO approves the PCE before performing it AND CRS approves the PCE within 14 days of the WEC SRO approval. No other approval is required to consider this PCE complete.

Answer: C

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 21 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 21 |
| System ID: | 21096 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-008-362-1-03, EO-1.9 |

NIP-PRO-04, 3.4.1, Item 2F, NIP-PRO-04, 3.4.4

| | |
|-------------|--|
| Answer: | c. Per NIP-PRO-04, 3.4.1, Item 2F: SRO review is required before implementing each Type 1 PCE. After SRO approval the PCE may be implemented. Per NIP-PRO-04, 3.4.4: Manager, Director, or General Supervisor shall review each type 1 PCE within 14 days of SRO approval. |
| Distractor: | a. SRO review is required before implementing each Type 1 PCE. Both the SS and CRS may perform this approval. However, Manager, Director, or General Supervisor shall review each type 1 PCE within 14 days of SRO approval. This would also be correct for a procedure change that "changes the intent" of the procedure. |
| Distractor: | b. Manager Operations <u>or</u> GSO are both authorized to approve a Type 1 PCE within 14 days of the SRO approval, however, there is no SRO approval prior to implementing the Type 1 PCE as required. |
| Distractor: | d. SRO review is required before implementing each Type 1 PCE and the WEC SRO is authorized to make this approval, however, the CRS is not authorized to perform the 14 day approval. Manager, Director, or General Supervisor shall review each type 1 PCE within 14 days of SRO approval |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 21 Cross References (table item links)

10CFR55

- 43(b)(3)

Cognitive Level

- 1

DER

- NM-2004-2533, Rev. NA

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.6 2.3/3.3 Knowledge of the process for making changes in procedures as described in the safety analysis report

Question Source

- New

PROC

- NIP-PRO-04 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

22

SYSID: 21097

Points: 1.00

The phase 1 core shuffle is in progress. Which one of the following conditions meets the Fuel Handling Procedure (FHP) criteria for stopping fuel movement?

- A. Last performance of the Refueling Platform Interlocks Test was completed twenty-four (24) hours ago.
- B. Air bubbles are observed from the vicinity of the grapple head when a fuel assembly is latched or disengaged.
- C. The fuel assembly nose piece is lowered to two (2) feet above the core top guide before establishing the correct orientation.
- D. A fuel assembly is moved to the spent fuel pool and the rod block interlock light clears when the bridge is clear of the reactor core.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 22 Details

| | |
|-------------------|--|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 22 |
| System ID: | 21097 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |
| Comment: | Objective: O1-OPS-001-234-1-02, EO-1.8.b |

N1-FHP-25, Attachment 4

| | |
|-------------|---|
| Answer: | b. Air leakage on the fuel grapple requires stopping fuel movement. Evidence of air bubbles indicates air leakage. |
| Distractor: | a. This interval for this surveillance is 7 days. The surveillance is current. A similar surveillance N1-PM-SO, Refuel Platform and Grapple Inspection, is required to be completed every 12 hours. |
| Distractor: | c. It is acceptable to lower the fuel assembly before establishing the correct orientation, however, the correct orientation is to be established before lowering the fuel assembly into the assigned core location. |
| Distractor: | d. This is correct operation of the refueling interlocks. The rod block interlock light is lit when the refueling bridge is over the reactor core and the main hoist is loaded. When clear of the reactor core (proximity switch) the rod block clears. |

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 22 Cross References (table item links)

10CFR55

- 43(b)(7)

Cognitive Level

- 2

Difficulty Level

- Level 2: System operation and response; requiring system/plant interrelationship knowledge to assess the situation and determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.2.29 1.6/3.8 Knowledge of SRO fuel handling responsibilities

Question Source

- New

PROC

- N1-FHP-25 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

23

SYSID: 21073

Points: 1.00

Given the following conditions:

- Your year-to-date exposure is 1800 mRem Total Effective Dose Equivalent (TEDE)
- You will be entering a Locked High Radiation Area
- The work will take forty-five (45) minutes to complete
- Work area radiation level is 1.6 Rem/hour
- The transient time EACH WAY is one (1) minute
- Transit path radiation level is 1.2 Rem/hour

Per GAP-RPP-07, Internal and External Dosimetry Program, which one of the following is the HIGHEST LEVEL OF AUTHORITY required to approve the dose extension to perform the work?

NOTE: Approvals are listed from lowest level to highest level of authority.

- A. Station Shift Supervisor.
- B. Rad Protection Manager
- C. Plant General Manager.
- D. Site Vice President.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 23 Details

| | |
|-------------------|------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT 23 |
| System ID: | 21073 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O3-OPS-006-343-3-40, EO-3.8

Answer: d. $[(1600 \text{ mRem/hr}) \times (0.75 \text{ hr})] + [(1200 \text{ mrem/60 min}) \times (2 \text{ min})] = 1240 \text{ mRem}$
1240 mRem (projected exp.) + 1800 mRem (current exp.) = 3040 mRem
This is above 3000 mRem which requires site vice president approval. Per GAP-RPP-07, 3.2.5: The following dose control levels have been established to prevent personnel from exceeding the administrative dose limits, and ensure equitable distribution of dose amongst workers who perform similar jobs. Appropriate station supervision and radiological protection management approval should be obtained to increase a worker's dose control level.

(1) 2,000 mrem per year--Radiological protection and line supervision approval and documented current year dose history are required to have the level increased.

(2) 2,500 mrem per year--The above approvals plus Radiation Protection Manager and Plant General Manager approval are required to have the level increased.

(3) 3,000 mrem per year--The above approvals plus notification of Site Vice President are required to have the level increased.

Distractor: a. Line supervisor is required for exposure from 2000-2499 mrem.

Distractor: b. Line supervisor is required for exposure from 2000-2499 mrem.

Distractor: c. Plant Manager is required for exposure from 2500-2999 mrem.

References Provided: NONE

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 23 Cross References (table item links)

10CFR55

- 41(b)(12)

Cognitive Level

- 3

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.3.4 2.5/3.1 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized

Question Source

- New

PROC

- GAP-RPP-07 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

24

SYSID: 21099

Points: 1.00

Per N1-ODP-PRO-0305, EOP/SAP Technical Bases, which one of the following describes when and why EOP-1, Attachment 2, MSIV LO/LO ISOL. BYPASS is performed with relation to performance of the step to "terminate and prevent all RPV injection except boron and CRD?"

- A. Must be completed PRIOR TO this action to prevent a loss of primary containment.
- B. Can be PERFORMED CONCURRENT WITH this action to prevent core wide power oscillations.
- C. Must be completed PRIOR TO this action to prevent an unintended addition of heat to the torus.
- D. Can be PERFORMED CONCURRENT WITH this action to prevent an unintended loss of the main condenser.

Answer: D

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 24 Details

| | |
|-------------------|-----------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO 24 |
| System ID: | 21099 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

Objective: O1-OPS-006-344-1-03, EO-1.3

Answer:

d. The MSIV low-low RPV water level isolation is bypassed since later steps in the Level branch may lower RPV water level to below the isolation setpoint. Defeating the low level isolation anticipates the possible level reduction and prevents unintended loss of the main condenser. Other MSIV isolations, such as high main steam line flow, are not defeated since they provide automatic protection for conditions requiring main steam line isolation.

The direction to bypass the isolation is prescribed as a concurrent step. The isolation may be bypassed immediately following entry of EOP-3, but lowering RPV water level to reduce reactor power or prevent power oscillations is of greater importance than maintaining the main condenser as a heat sink. Core instabilities may occur in a BWR when the reactor is operated at a relatively high power-to-flow ratios and recirculation flow is reduced. The potential for instabilities is largely dependent upon core inlet subcooling. The greater the subcooling, the more likely that power oscillations will occur and increase in magnitude.

Distractor:

a. The direction to bypass the isolation is prescribed as a concurrent step because lowering RPV water level to reduce reactor power or prevent power oscillations is of greater importance than maintaining the main condenser as a heat sink. MSIV closure is a PCIS isolation but is not the concern. From a primary containment viewpoint the concern in this situation is the heat addition to the torus and possible HCTL challenge.

Distractor:

b. The direction to bypass the isolation is prescribed as a concurrent step because lowering RPV water level to reduce reactor power or prevent power oscillations is of greater importance than maintaining the main condenser as a heat sink. The MSIV bypass is not performed to avoid power oscillations, this is avoided or minimized by lowering RPV water level

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Distractor:

to suppress reactor power.
c. The direction to bypass the isolation is prescribed as a concurrent step because lowering RPV water level to reduce reactor power or prevent power oscillations is of greater importance than maintaining the main condenser as a heat sink. If the main condenser is available as a heat sink and the isolation is not bypassed, then heat energy would be added to the torus when RPV water level is deliberately lowered.

References Provided: NONE

Question 24 Cross References (table item links)

10CFR55

- 43(b)(5)

Cognitive Level

- 1

Difficulty Level

- Level 3: Higher order knowledge item requiring anticipation, prediction, comprehension, and application of prior knowledge to determine the correct answer.

NUREG 1123 KA Catalog Rev. 2

- G2.4.18 2.7/3.6 Knowledge of the specific bases for EOPs

Question Source

- New

PROC

- N1-ODP-PRO-0305 Rev. NA

Question Setting

- C1 (License class closed reference)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

25

SYSID: 21206

Points: 1.00

Emergency events are in progress:

- (08:00) General emergency declared.
- (08:12) Notification sent with wind direction from 304°.
- (08:42) EOF is manned including county and state representatives.
- (08:52) Radiological Assessment Manager reports radiation levels up to 1 REM TEDE are projected outward to 10.2 miles from the site.
- (08:52) Wind direction HAS SHIFTED and is now from 278°.

Which one of the following is the correct information to be communicated to the EOF regarding protective action recommendations?

- A. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional Evacuations are not required.
- B. Continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships. Additional evacuations are being recommended for MEXICO and RICHLAND townships.
- C. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional Evacuations are not required.
- D. Some evacuations in SCRIBA Township will be discontinued. Continue the previously recommended evacuations in NEW HAVEN Township. Additional evacuations are being recommended for MEXICO and RICHLAND townships.

Answer: B

Associated objective(s):

Development Area (FIO)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Question 25 Details

| | |
|-------------------|-------------------------|
| Question Type: | Multiple Choice |
| Topic: | NRC SRO REPLACEMENT #25 |
| System ID: | 21206 |
| User ID: | |
| Status: | Active |
| Must Appear: | No |
| Difficulty: | 0.00 |
| Time to Complete: | 0 |
| Point Value: | 1.00 |
| Cross Reference: | LC1 03-01 |
| User Text: | |
| User Number 1: | 0.00 |
| User Number 2: | 0.00 |

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

Comment:

EPIP-EPP-08, Attachment 1, Table 1.2
EPIP-EPP-08, Attachment 5, 2.3.4, 2.3.5

Answer:

b. If dose at 10 miles is projected to meet or exceed 1 rem TEDE or 5 rem CDE (Thyroid), then make protective action recommendations and recommend evacuation to that distance in the affected areas. Also, PARs made previously must be accounted for when revised. For example, if a PAR to evacuate an ERPA was previously made and that PAR does not appear on a revised map (ERPAs change) that PAR must still be included in the revised recommendations to the State/County. Once a PAR is transmitted to State/County, it shall not be changed.

Therefore, continue the previously recommended evacuations in SCRIBA and NEW HAVEN Townships for ERPA 1,2,3,4,5,7,9,10 although the new ERPAs based on the windshift are 1,2,3,4,7 and NOT 5 and 9. Additional evacuations are to be recommended out to 10 miles which includes areas in NEW HAVEN, MEXICO, and RICHLAND townships. If projected doses exceed 1 REM TEDE for distances greater than 10 miles, PARs shall be made using convenient geographical boundaries (such as townships).

Distractor:

a. Additional evacuations are to be recommended for affected areas out to 10 miles.

Distractor:

c. PARs made previously must be accounted for when revised. For example, if a PAR to evacuate an ERPA was previously made and that PAR does not appear on a revised map (ERPAs change) that PAR must still be included in the revised recommendations to the State/County. Once a PAR is transmitted to State/County, it shall not be changed. Additional evacuations are to be recommended for affected areas out to 10 miles.

Distractor:

d. Additional evacuations are to be recommended for affected areas out to 10 miles.

References Provided: EPIP-EPP-08 (entire)

EXAMINATION ANSWER KEY

NRC 2004 UNIT 1 SRO WRITTEN EXAMINATION

procedure), Ten Mile Emergency Planning Zone (COLOR) map with ERPAs and Townshielines.

Question 25 Cross References (table item links)

10CFR55

- 43(b)(4)

Cognitive Level

- 3

NUREG 1123 KA Catalog Rev. 2

- G2.4.44 2.1/4 Knowledge of emergency plan protective action recommendations
- 295038 High Offsite Release Rate

Question Source

- New

PROC

- EPIP-EPP-08 Rev. NA

Question Setting

- C1 (License class closed reference)