U.S. Nuclear Regulatory Commission

15-01 BFN SRO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit: BFN / U1- U2 – U3
Region: I ☐ II ☒ III ☐ IV ☐	Reactor Type: W ☐ CE ☐ BW ☐ GE ☒
Start Time:	Finish Time:

Instructions

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

Applicant Certification

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

_____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	75/25/100 Points
Applicant's Scores	/ / Points
Applicant's Grade	/ / Percent

QUESTION 76 Rev 1

All three units are operating at full power when 0-AOI-57-1E, Grid Instability is entered:

- Efforts thus far have failed to stabilize the grid
- The Transmission Operator requests that BFN carry maximum outgoing VARs.
- Units 2 and 3 were successful in attaining 300 Outgoing VARs.
- While raising VARs Unit Received Panel 1-9-8 1-XA-55-8A window 9 GEN VOLTS PER HERTZ HIGH alarm and the UO verified that all appropriate Automatic Actions occurred.

Which ONE of the following completes the statements below?

The ODS __ (1) __ required to be notified.

A __ (2) __ hour notification is required to the NRC.

Reference Provided

A. (1) is
(2) one

B. (1) is NOT
(2) one

C. (1) is
(2) four

D. (1) is NOT
(2) four

ANSWER: **C**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295006 G2.4.30	
	Importance Rating		4.1

295006 SCRAM 2.4.30 Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

Explanation: **CORRECT** C, Expected Automatic Actions for GEN VOLTS PER HERTZ HIGH is Generator PCB 214 trips in 3 seconds. ODS notification is required due Generator / Reactor trip and a four hour report to the NRC is required due to the actuation of RPS.

A – incorrect – first part correct, second part incorrect plausible in that EPIP 1 6.3-U is based on a Turbine failure or damage to the Turbine or Generator seals and would require a 1 hour report.

B – incorrect – first part incorrect plausible in that the ODS is not notified for a number items listed in NPG-SPP-03.5 Appendix D, but a plant shutdown is NOT one of them. Second part incorrect see A above

D – incorrect – first part incorrect and second part correct see above

Technical Reference(s): NPG-SPP-03.5

Proposed references to be provided to applicants during examination: **NPG-SPP-03.5 Appendix A**

Learning Objective (As available): OPL171.092 3 and 4

Question Source: Bank: 0610 NRC #100
Modified Bank:
New:

Question History: Previous NRC: 0610 NRC #100

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43 b(5)

QUESTION 77 Rev 2

Unit 3 is shut down due to an LCO 3.0.3 entry condition.

- Mode 4 was entered
- 3D RHR pump is in Shutdown Cooling
- Drywell Equipment Hatch is open

Subsequently plant equipment problems result in the following conditions:

- RHR Pump 3D flow lowers to 3000 gpm
- Reactor Bottom Head temperature is 215 °F

Which ONE of the following completes both statements below?

RHR Shutdown Cooling __ (1) __ considered in-service.
In accordance with EPIP-1, Emergency Plan Implementing Procedure __ (2) __

Reference Provided

A. (1) is
(2) NO Emergency Action Levels are exceeded.

B. (1) is
(2) an Alert EAL is met.

C. (1) is NOT
(2) NO Emergency Action Levels are exceeded.

D. (1) is NOT
(2) an Alert EAL is met.

ANSWER: **D**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295021 AA2.02	
	Importance Rating		3.4

295021 AA2.02 Ability to determine and/or interpret the following as they apply to Loss of Shutdown Cooling: RHR/shutdown cooling system flow

Explanation: **CORRECT D:** first part in accordance with 3-SR-2 and 3-AOI-74-1 RHR Shutdown Cooling Flow has to be great enough so that the RHR Shutdown Cooling Low Flow annunciator is not in alarm, that annunciator alarms at 3700 gpm decreasing. Second part - An Alert is required in accordance with EAL 1.5-A.

A Incorrect first part incorrect plausible in that 3D RHR pump is aligned in SD Cooling and flow is 3000 gpm, second part incorrect plausible in that if Tech Specs did not require Mode 4 conditions, this would be correct answer. LCO 3.0.3 required mode 4 and with the Primary Containment open, Mode 4 conditions are required.

B Incorrect first part Incorrect see A above. Second part Correct

C Incorrect first part Correct. Second part Incorrect see A above

Technical Reference(s): EPIP-1Rev 49, 3-SR-2 Rev 73, 3-AOI-74-1 Rev 24, 3-ARP-9-3D window 11 Rev 28

Proposed references to be provided to applicants during examination: EPIP-1

Learning Objective (As available): OPL171.044 ILT 12.f, 13.e, OPL171.075 ILT 2

Question Source:	Bank: Modified Bank: BFN NRC #79 New:
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X
10 CFR Part 55 Content:	55.43 (b)(5)

BFN NRC 1205
QUESTION 79

Unit 3 is shutdown due to LCO 3.0.3 entry condition, with the following conditions:

- Drywell Equipment Hatch is open
- Reactor Recirculation Pumps are out of service
- RHR Loop II is operating in Shutdown Cooling

SUBSEQUENTLY, Reactor level lowers to (-)7 inches

Which ONE of the following completes the statements below given the attached illustrations?

Reactor Coolant Stratification __(1)__ indicated.

__(2)__ in accordance with EPIP-1, Emergency Plan Implementing Procedure.

Reference and Illustrations Provided

A. (1) is
(2) An Alert is met

B. (1) is
(2) NO Emergency Action Levels are exceeded

C. (1) is NOT
(2) An Alert is met

D. (1) is NOT
(2) NO Emergency Action Levels are exceeded

QUESTION 78 Rev 2

Unit 1, 2, and 3 are currently at 100% power.

- Fuel movement is in progress in Unit 1 Spent Fuel Pool.
- A fuel bundle is severely damaged.

Subsequently:

- Indicated Iodine-131 levels at the Site Boundary have exceeded the General Emergency limit.
- Radiation levels in numerous areas of the Reactor Building are above Max Safe.

What mitigating strategy is required to be performed in accordance with the EOIs and why?

Note: 1-EOI-1, RPV Control
1-EOI-3, Secondary Containment Control
0-EOI-4, Radioactive Release Control
1-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations

A. Enter 1-GOI-100-12A, from 1-EOI-3 and proceed to Cold Shutdown to mitigate the direct threat that exists relative to secondary containment integrity, to equipment located in secondary containment, and to continued safe operation of the plant.

B. Enter 1-GOI-100-12A, from 1-EOI-3 and proceed to Cold Shutdown to limit the release of radioactivity discharging into areas outside the primary and secondary containments.

C. Enter 1-EOI-1 from 0-EOI-4, Scram the Reactor and Emergency Depressurize to mitigate the direct threat that exists relative to secondary containment integrity, to equipment located in secondary containment, and to continued safe operation of the plant.

D. Enter 1-EOI-1 from 0-EOI-4, Scram the Reactor and Emergency Depressurize to limit the release of radioactivity discharging into areas outside the primary and secondary containments

ANSWER: A

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295023 G2.4.21	
	Importance Rating		4.6

295023 Refueling Accident G2.4.21 Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release

Explanation: **CORRECT A**: Entry into GOI-100-12A is correct. The bases according to the EOIPM 0-V-E SC/R-9 & 10 are to mitigate the direct threat that exists relative to secondary containment integrity, to equipment located in secondary containment, and to continued safe operation of the plant.

B – Incorrect – Plausible in that entry into GOI-100-12A is correct however the bases given are for entering EOI-1 from EOI-3 with a primary system discharging into secondary containment and inserting a scram see EOIPM 0-V-E SC/R-6 and 0-V-F RR-5.

C – Incorrect – Plausible in that entry into EOI-1 would be correct if ED is required and the candidate may chose this based on exceeding the GE limits. The bases given are for conducting an orderly shutdown, see A above.

Technical Reference(s): EOI-3 Rev 11, 0-EOI-4 Rev 6, EOI Program Manual Rev 2

Proposed references to be provided to applicants during examination: None

Learning Objective (As available):

Question Source:	Bank: Modified Bank X New:
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X
10 CFR Part 55 Content:	55.43 (b)(5)

QUESTION 79 Rev 3

Unit 1 was at 100% power when one Safety Relief Valve failed open and was unable to be closed. The Reactor Mode Switch was placed in SHUTDOWN.

The following conditions exist:

- Reactor power 20% and lowering due to SLC injection
- Reactor pressure 900 psig and stable
- Suppression pool temperature 190 °F and rising
- Suppression pool level 16.0 ft and slowly rising

Which ONE of the following identifies the required action in accordance with 1-EOI-1 RPV Control and 1-EOI-2, Primary Containment Control?

Reference Provided

A. Lower reactor pressure, must maintain $\leq$ 100 °F/Hr.

B. Emergency depressurize the RPV using the safety relief valves

C. Rapidly depressurize the RPV with the main turbine bypass valves.

D. Lower reactor pressure, OK to exceed 100 °F/Hr.

Answer: **B**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295026 EA2.03	
	Importance Rating		4.0

295026 Ability to determine and/or interpret the following as they apply to Suppression Pool High Water Temperature: Reactor pressure

Explanation: **Answer B – CORRECT:** The conditions given are in the un-safe area of the HCTL curve and emergency depression is required.

A – incorrect – Plausible if the student remembers that lowering Reactor pressure will give more margin to HCTL and that $\leq$ 100°F/Hr is the normal cool down limit in the EOIs.

C – incorrect – plausible that the candidate may rapidly depressurize the RPV in anticipation of an ED using the override step RC/P-3 however this is not allowed since the Reactor is not subcritical and emergency depressurization is required.

D – incorrect – plausible in that this would be correct IAW override step RC/P-7 if conditions were in the safe area of curve 3 HCTL.

Technical Reference(s): 2-EOI-1 Rev 15 and 2-EOI-2 Rev 14

Proposed references to be provided to applicants during examination: Heat Capacity Temperature Limit Curve 3

Learning Objective (As available): OPL171.203 ILT 12 and 13

Question Source:	Bank: X Modified Bank: New:
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X
0 CFR Part 55 Content:	55.43 b(5)

QUESTION 80 Rev 1

An ATWS and LOCA have occurred on Unit 2, resulting in the following plant conditions:

- Suppression Chamber Pressure is 53 psig and rising 1 psig every 2 minutes
- Drywell Temperature is 325°F and rising 1°F every 5 minutes
- Drywell Pressure is 51 psig and rising 1 psig every 2 minutes
- Suppression Pool Level is 18 feet

Which ONE of the following describes the appropriate EOI mitigating strategy(s) in accordance with 2-EOI-2, Primary Containment Control?

A. Vent the Drywell ONLY

B. Initiate Drywell Sprays ONLY

C. Vent the Suppression Chamber ONLY

D. Initiate Drywell Sprays AND vent the Suppression Chamber

ANSWER: D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295028 EA2.05	
	Importance Rating		3.8

295028 Ability to determine and/or interpret the following as they apply to High Drywell Temperature: Torus/suppression chamber pressure: Plant-Specific

Explanation: **CORRECT D:** With Suppression Pool level below 19 feet, Drywell Sprays are available and is an appropriate response. In addition with Suppression Chamber pressure approaching 55 psig venting IAW appendix 13 would also be appropriate to ensure that 55 psig was not exceeded so that Containment Integrity remains intact.
A - Incorrect - Plausible because venting the Drywell is an option if Suppression Chamber venting is NOT available, there are no indication that Suppression Chamber vent path is not available and Suppression Pool level is below 20 feet. Drywell spray is also required.
B – Incorrect – plausible because partially correct, but not the ONLY appropriate response with the given indications.
C- Incorrect – plausible because partially correct, but not the ONLY appropriate response with the given indications.

Technical Reference(s): 2-EOI-2 Rev 14, EOIPM 0-V-D Rev 1

Proposed references to be provided to applicants during examination: NONE

Learning Objective (As available): OPL171.203 ILT 8, 9, and 13

Question Source:	Bank: Modified Bank: BFN NRC 0610 #78 New:
Question History:	Previous NRC:
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis : X
10 CFR Part 55 Content:	55.43 (b)(5)

QUESTION 81 Rev 1

An ATWS has occurred on Unit 2.

- RPV water level was lowered in accordance with 2-C-5, Level / Power Control
- SLC is injecting
- RPV water level is being restored to (+) 2 to (+) 51 inches
- MSRVs are being cycled for pressure control

Subsequently the following indications and alarms are reported:

- RPV water level is (-) 35 inches
- Suppression Pool Temperature is 106 °F
- SLC tank level is 63%
- SRM PERIOD, (2-9-5A, Window 20)
- Multiple Nuclear Instrumentation alarms
- APRM downscale lights extinguished

Which ONE of the following describes the action(s) that is(are) directed in accordance with 2-C-5, Level / Power Control?

A. Continue to raise RPV water level at a slower rate to (+) 2 to (+) 51 inches.

B. Stop raising RPV water level.
Maintain RPV water level with (-) 35 inches as the upper limit.

C. Stop and prevent all injection into the RPV (except RCIC, CRD & SLC).
Re-inject when RPV water level drops below (-) 50 inches.

D. Stop and prevent all injection into the RPV (except RCIC, CRD & SLC).
Re-inject when reactor power is < 5%.

ANSWER: C

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295037 EA2.03	
	Importance Rating		4.4

295037 Knowledge of the interrelations between SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown and the following: SBLC tank level

Explanation: **CORRECT C:** C5-31 directs proceeding to A, the C5-5 override conditions for proceeding to step B are not met so with Reactor power above 5% the requirement is to stop and prevent and lower level to (-) 50 inches.

A – Incorrect Plausible in that Override Step C5-31 directs returning to Step C5-5, if examinee doesn't recall override. When injecting with an ATWS it is directed to raise injection slowly while observing Reactor Power, applicant may believe that decreasing injection rate is all that is required since hot shutdown boron weight has been injected.

B – Incorrect Plausible in that Override Step C5-31 directs returning to Step C5-5, if examinee doesn't recall override. When injecting with an ATWS it is directed to raise injection slowly while observing Reactor Power, applicant may believe that stopping injection is all that is required since hot shutdown boron weight has been injected. Step C5-11 has the Unit Supervisor direct to Stop lowering RPV water level.

D – Incorrect Plausible in that if Suppression pool temperature was greater than 110 °F and Reactor water level was lowered below -50 inches and power was < 5% this would be correct.

Technical Reference(s): 2-C-5 Rev 13

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.205 ILT 6

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43 (b)(5)

QUESTION 82 Rev 1

Unit 2 is operating at 96% power when the following occurred:

- 'A' Recirculation Pump speed started to rise.
- The US directed the recirc pump tripped and reactor scram when recirc pump speed could not be controlled.
- Subsequently the BOP operator reports 2-TIS-1-60C temperature rising rapidly and numerous radiation alarms.
- The US then directs closing the MSIVs.

The following conditions currently exist:

- All control rods are FULL IN and 2-AOI-100-1 is in progress
- Reactor pressure is 780 psig and lowering
- 2-TIS-1-60C indicates 320 degrees F. and rising slowly
- BOP operator reports 'B' MSIV line has failed to isolate
- 2-RE-90-272A indicates 310 R/HR
- 2-RE-90-273A indicates 275 R/HR

Which ONE of the following identifies the correct Emergency Action Level/Designator in accordance with the Emergency Classification Procedure - EPIP-1?

Reference Provided

A. 2.3-A

B. 2.5-U

C. 4.2-U

D. 4.2-S

ANSWER: D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		1
	K/A#	295038 G2.4.41	
	Importance Rating		4.6

295038 High Off-Site Release Rate G2.4.41 Knowledge of the emergency action level thresholds and classifications.

Explanation: **CORRECT D:** Classification applies to MSL break that cannot be isolated by PCIS logic or from MCR.

A – Incorrect - Plausible if applicant reads the radiation readings incorrectly and believes that one of the radiation levels is above the value in the table.

B – Incorrect – Plausible if applicant only addresses the inability to isolate any line exiting containment when isolation is required i.e. indications of loss of primary containment.

C – Incorrect – Plausible if applicant only addresses the main steam line break and not the failure to isolate.

Technical Reference(s): EPIP-1 Rev 49

Proposed references to be provided to applicants during examination: EPIP-1 Section 2 and Section 4

Learning Objective (As available): OPL171.075 Rev. 27, ILT L.O. 2

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge: Comprehension or Analysis: X

SRO-Only: 10CFR55.43 (b)(1) and 55.43(b)(5)

QUESTION 83 Rev 1

Unit 1 has experienced an ATWS with the following conditions:

- 19 Control Rods are at position 48
- Reactor Recirculation Pumps are at minimum speed
- SLC is NOT injecting
- MSIVs are open and Reactor pressure is stable on bypass valves
- 1-EOI-1, RPV Control was entered on low Reactor water level
- ATWS actions are complete

Subsequently, the operator reports that Reactor Power is on range 8 of the IRMs.

Which ONE of the following identifies the required procedure(s) for Reactor Power control?

A. 1-EOI-1, RPV Control, RC/Q ONLY

B. 1-AOI-100-1, Reactor Scram ONLY

C. 1-EOI-1, RPV Control, RC/Q and 1-C-5, Level / Power Control

D. 1-AOI-100-1, Reactor Scram and 1-C-5, Level / Power Control

Answer: C

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295015 AA2.01	
	Importance Rating		4.3

295015 AA2.01 Ability to determine and / or interpret the following as they apply to Incomplete SCRAM: Reactor Power

Explanation: **ANSWER C**: With the reactor NOT subcritical and no boron injected RC/Q is required for power control/control rod insertion. RC/L-3 requires 1-C-5 to be entered for Reactor water level guidance and power control.

A – Incorrect – Plausible because it is partially correct in that RC/Q is the power control leg of EOI-1

B – Incorrect – Plausible in that this is would be partially correct if power was on range 6 or below and RC/Q is exited to AOI-100-1.

D – Incorrect – Plausible in that this would be correct if power was on IRM range 6 or below and RC/Q is exited to AOI-100-1, RC/L-3 directs entering 1-C-5.

Technical Reference(s): 1-EOI-1 Rev 3, 1-C-5 Rev 3, 1-AOI-100-1 Rev 15

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.202 ILT 14

Question Source: Bank:
Modified Bank: BFN Bank
New:

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43(b) (5)

QUESTION 84

Unit 2 is operating at 100% power.

A UNISOLABLE leak has occurred in the RWCU Heat Exchanger Room and its maximum normal operating temperature has been exceeded.

Which ONE of the following completes the statements below?

A level instrument indication that is affected as the RWCU Heat Exchanger Room temperature element, 69-29G, approaches the maximum safe operating temperature is __ (1) __.

The procedure required to be implemented before the room temperature exceeds the maximum safe operating temperature is __ (2) __.

NOTE: 2-EOI-1, RPV Control
2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operations

Reference Provided

A. (1) LI-3-208B
(2) 2-GOI-100-12A

B. (1) LI-3-208B
(2) 2-EOI-1

C. (1) LI-3-60
(2) 2-GOI-100-12A

D. (1) LI-3-60
(2) 2-EOI-1

ANSWER: B

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295032 EA2.02	
	Importance Rating		3.5

295032 Ability to determine and / or interpret the following as they apply to High Secondary Containment Area Temperature: Equipment Operability

Explanation: **CORRECT B:** First part 208B is a panel 2-9-3 Normal range level instrument and affected by temperature per Table 6. Second part due to the high temperature being from a steam leak, ED will reduce the leak the correct procedure is 2-EOI-1, RPV Control

A – Incorrect – First part Correct. Second part Incorrect plausible in that this would be correct if the high temperature was not caused by a primary system discharging into secondary containment.

C – Incorrect – First part Incorrect – Plausible in that this is a normal range level instrument that is unaffected by temperature per Table 6. Second part Incorrect see A above.

D – Incorrect – First part Incorrect see C above, second part Correct

Technical Reference(s): 2-EOI-3 Rev 15, Caution 1 and Table 6

Proposed references to be provided to applicants during examination: **Caution 1 (including Curve 8 and Table 6) ONLY**

Learning Objective (As available): OPL171.003 ILT 9 OPL171.201 ILT 11

Question Source: Bank:
Modified Bank: BFN 1108 NRC #85
New:

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 10CFR55.43(b)(5)

QUESTION 85 Rev 2

Unit 3 is at 100% power when the following annunciators alarm due to **actual** high radiation:

- REFUELING ZONE EXHAUST RADIATION HIGH, 3-9-3A, window 34
- REACTOR ZONE EXHAUST RADIATION HIGH, 3-9-3A, window 21

Subsequently the UO reports:

- REFUELING ZONE EXHAUST RADIATION HIGH, 3-9-3A, window 34 is **RESET**
- REACTOR ZONE EXHAUST RADIATION HIGH, 3-9-3A, window 21 is **RESET**
- 3-RE-90-9A RWCU System Area El. 621 Rx Bldg is in alarm reading 300 mR/hr

Note:

- 3-OI-30B Reactor Zone Ventilation System
- 3-EOI Appendix-8E Bypassing Group 6 Low RPV Level and High Drywell Pressure Isolation Interlocks
- 3-EOI Appendix-8F, Restoring Refuel Zone And Reactor Zone Ventilation Fans Following Group 6 Isolation
- 3-OI-30A Refuel Zone Ventilation System

Based on this information which procedure(s) will the SRO direct the Unit Operator to use to restore Secondary Containment Ventilation?

A. 3-OI-30B **only**

B. 3-EOI-Appendix-8E and 8F

C. 3-OI-30A **and** 3-OI-30B **only**

D. 3-EOI- Appendix-8F **only**

Answer: D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		1
	Group #		2
	K/A#	295034 G2.4.45	
	Importance Rating		4.3

295034 Secondary Containment Ventilation High Radiation G2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm.

Explanation: **CORRECT D:** EOI-3 should be entered based on Reactor and Refuel zone exhaust Rad above 72 mR/hr and based on secondary containment area Radiation above max normal. IAW with EOI-3 (SCC-1) with the Reactor Zone and Refuel Zone Ventilation isolated and Radiation levels below the isolation setpoint you are directed to restart RX and Refuel Zone ventilation IAW Appendix 8F.

A. Incorrect – Plausible in that the OI is used during normal operations to place the Reactor Zone Fans in service and that the secondary containment can be maintained without the Refuel Zone Fans.

B. Incorrect – Plausible in that SC/T-2 allows both appendix 8E and 8F to be performed if defeating interlocks is necessary. In this case no interlocks need to be defeated.

C. Incorrect – Plausible in that the OIs are used during normal operations to place the Reactor Zone and Refuel Zone Fans in service.

Technical Reference(s) 3-EOI-3 Rev 13, 3-EOI Appendix 8F Rev 2, 3-AOI-64-2d Rev 16, 3-OI-30A Rev 30 and B Rev 23.

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.067 ILT 2.b and OPL171.204 ILT 3

Question Source:	Bank: Modified Bank: BFN Bank New:
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis : X

10 CFR Part 55 Content: 10CFR55.43(b)(5)

QUESTION 86 Rev 1

Unit 2 is shutdown with a cooldown is in progress at a Reactor Pressure of 90 psig.

In accordance with Technical Specifications 3.4.7 and 3.5.2 Bases, how many RHR Shutdown Cooling Subsystems are there **and** if RHR Loop I is aligned for Shutdown Cooling can it still be considered an Operable LPCI Subsystem?

A. Two; Yes

B. Four; Yes

C. Two; No

D. Four; No

ANSWER: **B**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	203000 G2.2.37	
	Importance Rating		4.6

203000 Residual Heat Removal /Low Pressure Coolant Injection: Injection Mode (Plant Specific)
Ability to determine operability and/or availability of safety related equipment.

Explanation: **CORRECT B:** With RPV pressure less than 100 psig SDC CAN be aligned and while aligned it CAN still be considered an operable LPCI System. There are four SDC Subsystems, one for each RHR Pump and Heat Exchanger.
A – Incorrect – First part Incorrect plausible in that there would only be two RHR shutdown cooling subsystems, because for LPCI this would be correct that each loop is a subsystem and for SDC since there are only two injection paths it would make sense again that there are only TWO subsystems but for SDC the bases allows a subsystem for each pump and heat exchanger. Second part Correct
C – Incorrect – First part Incorrect see A above. Second part Incorrect plausible that with RHR aligned for SDC Mode that it could not be considered operable for LPCI Mode, this is a tech spec bases allowance. In the Suppression Pool Cooling mode RHR would not be operable for LPCI mode if the 74-59 valve is throttled to far open.
D – Incorrect – First part Correct and Second part Incorrect plausible that with RHR aligned for SDC Mode that it could not be considered operable for LPCI Mode, this is a tech spec bases allowance. In the Suppression Pool Cooling mode RHR would not be operable for LPCI mode if the 74-59 valve is throttled to far open.

Technical Reference(s): TS Bases 3.5.1, 3.9.7, and 3.9.8

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.087 ILT 5

Question Source: Bank:
Modified Bank: BFN 0707 NRC
New:

Question History: Previous NRC: BFN 0707 NRC

Question Cognitive Level: Memory or Fundamental Knowledge: X
Comprehension or Analysis :

10 CFR Part 55 Content: 10 CFR 55.43(b)(2)

QUESTION 87 Rev. 2

Unit 1 reactor is in startup in accordance with 1-GOI-100-1A, UNIT STARTUP. The following conditions currently exist:

- All SRMs are reading between 700 and 1000 cps
- All IRMs are on range 1 or 2
- All Nuclear Instrumentation is OPERABLE

Subsequently at 0800:
SRM C begins to repeatedly spike up to approximately 3000 cps and immediately returns to its previous reading.

In accordance with 1-OI-92 Source Range Monitors the US directs the operator to __ (1) __.

While evaluating SRM C The OATC reports that SRM A failed downscale.

In accordance with Tech Spec 3.3.1.2 the required action(s) is/are __ (2) __.

Reference Provided

A. (1) stop Control Rod withdrawal and bypass SRM C
   (2) restore one of the SRMs to operable status within 4 hours only

B. (1) stop Control Rod withdrawal and bypass SRM C
   (2) suspend Control Rod withdrawal and restore one SRM to operable status within 4 hours

C. (1) bypass SRM C only
   (2) restore one of the SRMs to operable status within 4 hours only

D. (1) bypass SRM C only
   (2) suspend Control Rod withdrawal and restore one SRM to operable status within 4 hours

ANSWER: **A**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	215004 G2.4.47	
	Importance Rating		4.2

215004 Source Range Monitor System G2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.

Explanation: **CORRECT A:** IAW 1-OI-92 When an SRM or IRM first gets noisy stop control rod withdrawal and place the channel in bypass. IAW Tech Spec 3.3.1.2 with one required SRM INOP (3 are required) restore the required SRM to operable within 4 hours.

B – Incorrect – Part 1 correct Part 2 Incorrect plausible that the Tech Spec would require stopping Control Rod withdrawal however this is not required unless 3 required SRMs are INOP.

C – Incorrect – Part 1 incorrect – Plausible that the OI would not stop Control Rod withdrawal since the Tech Spec does not. Part 2 – correct see A above.

D – Incorrect – Part 1 incorrect see C above Part 2 incorrect see B above.

Technical Reference(s): 1-OI-92 Rev 9 and Tech Spec 3.3.1.2 Amendment 234

Proposed references to be provided to applicants during examination: **Tech Spec 3.3.1.2 and table 3.3.1.2-1**

Learning Objective (As available): OPL171.019 Rev. 13, ILT L.O. V.B.10 and 13

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: NO
Question Cognitive Level:	Memory or Fundamental Knowledge: X Comprehension or Analysis :
10 CFR Part 55 Content:	55.43 (b)(2)

QUESTION 88 Rev 2

Unit 3 has entered Mode 1 at **08:00** on June 1st when the following sequence of events occurs:

10:00 APRM 2-Out-Of-4 Voters, **Voter 1** failed its surveillance and did **NOT** generate an output signal to RPS.

11:00 IM report that a review of the surveillance indicates that the 2-Out-Of-4 **Voter 4** also failed acceptance criteria and has been declared INOP.

Which of the following is the most limiting Technical Specification required actions for these conditions?

Reference Provided

A. Required Action A.1 OR A.2 must be performed by 22:00.

B. Required Action B.1 OR B.2 must be performed by 17:00.

C. Required Action C.1 must be performed by 12:00.

D. Required Action G.1 must be performed by 23:00.

Answer: **B**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	215005 A2.04	
	Importance Rating		3.9

215005 Ability to (a) predict the impacts of the following on the AVERAGE POWER RANGE MONITOR/LOCAL POWER RANGE MONITOR SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: SCRAM trip signals

Explanation: **CORRECT B:** Voter 1 inputs to RPS A and Voter 4 inputs to RPS B, RPS trip capability is maintained, however you have a channel inoperable in both trip systems Action B.1 OR B.2
A – Incorrect: Plausible in that this would be correct for the first voter failure and condition A is for one or more required channels inoperable.

C – Incorrect: Plausible in that if voter 1 and 4 input to the same channel of RPS (A or B) then this would be correct.

D – Incorrect: Plausible in that if the candidate goes from function 2.e of table 3.3.1.1-1 to the Conditions Referenced from required action D.1 column of the table then required action G is referenced and this is the correct time frame for condition G from the second failure.

It is a common misconception that voters do not supply any specific RPS Channel but Voter 1 supplies a trip to RPS A1 and Voter 4 trips RPS B2

Technical Reference(s): Tech Spec 3.3.1.1 RPS Instrumentation Amendment 221

Proposed references to be provided to applicants during examination: Tech Spec 3.3.1.1 RPS Instrumentation, NO Bases and only 2.a,b,c,d,e,f of table 3.3.1.1-1 (Setpoints Redacted)

Learning Objective (As available):

Question Source: Bank:
Modified Bank: BFN 1404 NRC #87
New:

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.41 (b)(2)

QUESTION 89 Rev 1

Unit 3 is operating at 100% power, when a LOCA occurs.

30 seconds after the occurrence of the LOCA operators report the following:

- 19 control rods are position 02 and all others are inserted
- RPV water level is less than (-) 122 inches and lowering
- Drywell Pressure is 15 psig and rising
- ADS BLOWDOWN AUX RELAYS ENERGIZED (3-9-3C, window 4) in alarm
- ADS BLOWDOWN TIMERS INITIATED (3-9-3C, window 11) in alarm

One minute later the operators report the following:

- RPV water level lowered to (-) 150 and has recovered to (-) 125 inches
- Drywell Pressure is 21 psig and still rising
- ALL ECCS Systems are operating as expected

Which ONE of the following should the Unit Supervisor direct for the ADS System?

A. Do NOT INHIBIT ADS.

B. INHIBIT ADS in accordance with 3-C-5, Level / Power Control.

C. Reset the ADS timers IAW 3-ARP-9-3C every 95 seconds.

D. INHIBIT ADS in accordance with 3-EOI-1, RPV Control.

ANSWER: **D**

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	218000 A2.02	
	Importance Rating		3.6

218000 ADS Ability to (a) predict the impacts of the following on the ADS System ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Large Break LOCA

Explanation: **ANSWER D**: With level lowering to minus 150 inches and restoring to minus 125 inches (above (-)162 inches) and the timers initiated, direction is given in accordance with 3-EOI-1, RPV Control step RC/L-5 to Inhibit ADS.

A – Incorrect – plausible in that EOIPM O-V-C RC/L-5 states If the timer does not initiate or level does not drop below -120", the ADS logic is not inhibited so that the system will still provide an automatic backup for high pressure injection in small break loss of coolant accidents.

B– Incorrect – plausible because this would be correct if 20 control rods were at position 02 with all other rods fully inserted

C – Incorrect – plausible in that 3-ARP-9-3C window 11 gives direction to reset the timers but only if necessary during performance of a surveillance

Technical Reference(s): 3-EOI-1 Rev 10, EOI Bases 0-V-C Rev 2

Proposed references to be provided to applicants during examination: NONE

Learning Objective (As available): OPL171.043 ILT 6

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43(b) (5)

QUESTION 90 Rev 3

Unit 2 is operating at 100% power when the following event occurs:

6-1-14 at 10:00 2-PIS-64-56B Drywell Pressure High PCIS Instrument fails downscale

The SM has decided not to place the instrument in a tripped condition because another instrument has already failed causing a half scram in RPS A.

If 2-PIS-64-56B is not returned to operable status or tripped within the allowable time frame, when is Unit 2 **required** to be in Cold Shutdown in accordance with Tech Spec 3.3.6.1.

Reference Provided

A. 6-2-14 at 22:00

B. 6-2-14 at 23:00

C. 6-3-14 at 10:00

D. 6-3-14 at 22:00

Answer: C

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		1
	K/A#	223002 A2.07	
	Importance Rating		3.2

223002 A2.07 Ability to (a) predict the impacts of the following on the Primary Containment Isolation System/Nuclear Steam Supply Shutoff; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Various Process instrumentation failures.

Explanation: **CORRECT C**: PIS 64-56B is one of four High Drywell Pressure switches for the Group 6 isolation. With one inoperable, T.S. 3.3.6.1 table states two per trip system are required, so Condition A.1 is entered at 10:00 on 6-1-14. Condition A.1 has a place the channel in trip within 12 time completion, so at the end of that time (6-1-14 at 22:00), Condition C.1 states Enter the Condition referenced in the Table immediately (6-1-14 at 22:00). That condition is G. G.1 states be in Hot Shutdown within 12 hours (6-2-14 at 10:00) and G.2 says be in Cold Shutdown within 36 hours (6-3-14 at 10:00).

A. incorrect because this is the time to be in Cold Shutdown if the twelve hours is not taken for Condition A.1. 6-1-14 at 10:00 plus 36 hours to be in Cold Shutdown is 6-2-14 at 22:00.

B. incorrect because this is the time to be in Cold Shutdown if the B.1 one hours is applied and not the 12 hours allowed by Condition A.1. 6-1-14 at 10:00 plus 1 hour plus 36 hours to be in Cold Shutdown is 6-2-14 at 2300.

D. incorrect because this is the time to be in Cold Shutdown if the twenty four hours is applied and not the

Technical Reference(s): Tech Spec 3.3.6.1 Amendment 253

Proposed references to be provided to applicants during examination: **Unit 2 Tech Spec 3.3.6.1 and Table 3.3.6.1-1 with all Allowable Values redacted.**

Learning Objective (As available): OPL171.017 A.4

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: NO
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis : X
10 CFR Part 55 Content:	55.43 (b)(2)

QUESTION 91 Rev 2

Unit 3 is operating at 100% power,
The following alarm was received:

- CONTROL ROD DRIVE UNIT TEMP HIGH (3-9-5A, window 17)
- Control Rod 34-19 is the cause of the alarm and is greater than 350 °F.

The actions of 3-ARP-9-5A window 17 have been performed:

- CRD flushing in accordance with 3-TI-393, Evaluation of CRD Temperature Alarms and 3-OI-85, Control Rod Drive System is completed.
- Control Rod mechanism 34-19 temperature remains greater than 350 °F

Control Rod 34-19 is Declared SLOW

- **SEE THE ATTACHED ILLUSTRATION for CONTROL RODS PREVIOUSLY DECLARED SLOW**

Which ONE of the following completes the statements below?

The Tech Spec required action is __ (1) __.

In accordance with Tech Spec 3.4.1 Bases __ (2) __ would allow exiting the Tech Spec required action listed above?

Reference and Illustration Provided

A. (1) be in Mode 3 in 12 hours
(2) declare Control 34-19 INOP and fully insert it within 3 hrs only

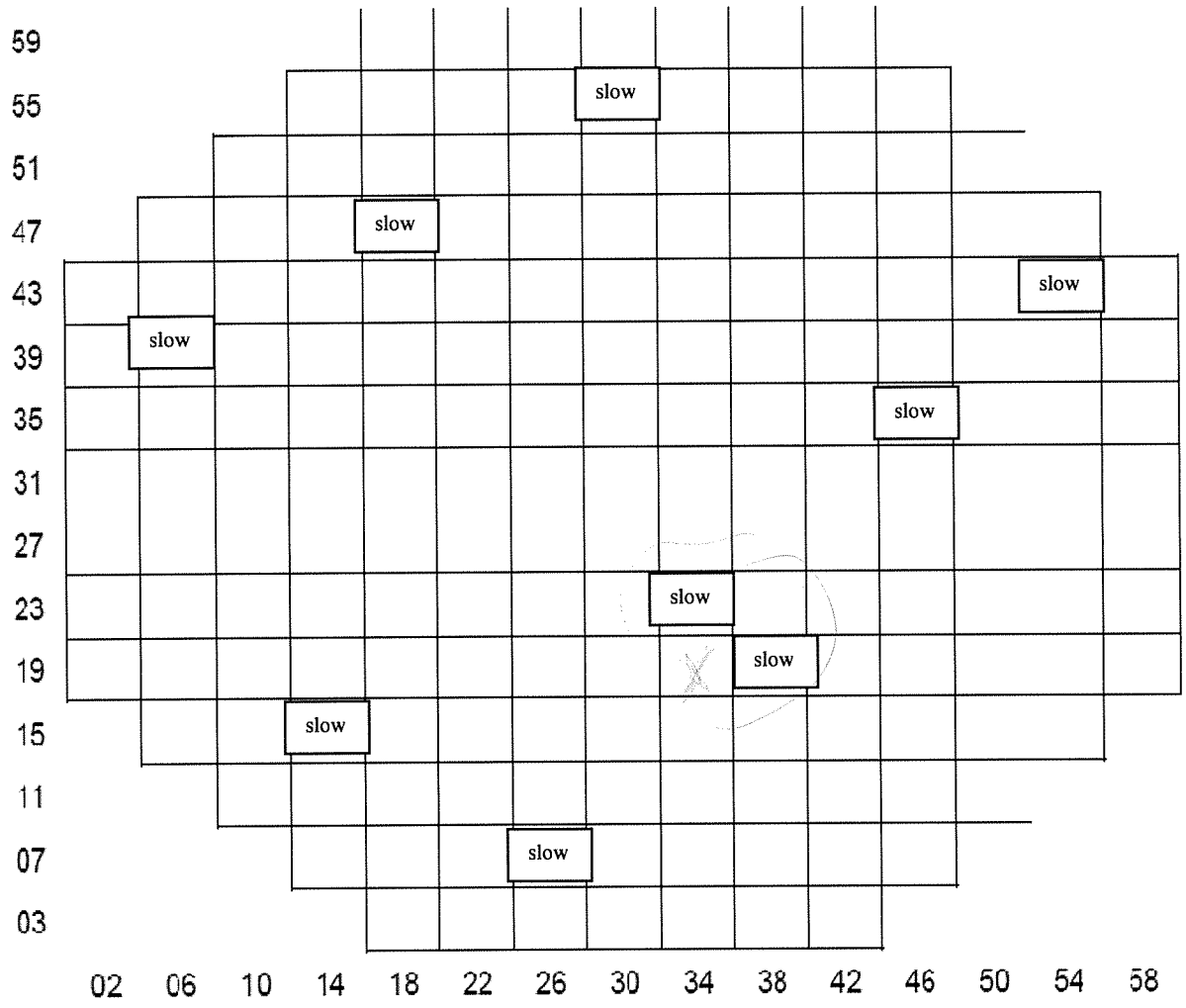
B. (1) be in Mode 3 in 12 hours
(2) declare Control 34-19 or 34-23 or 38-19 INOP, fully insert it within 3 hours and disarm it within 4 hours

C. (1) declare Control Rod 34-19 INOP only
(2) declare Control 34-19 INOP and fully insert it within 3 hrs only

D. (1) declare Control Rod 34-19 INOP only

(2) declare Control 34-19 or 34-23 or 38-19 INOP, fully insert it within 3 hours and disarm it within 4 hours

Answer: **B**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Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	201001 A2.08	
	Importance Rating		2.8

201001 Ability to (a) predict the impacts of the following on the Control Rod Drive Hydraulic System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Inadequate system flow

Explanation: **CORRECT B**: Part 1– When Control Rod 34-19 is declared slow there are 3 adjacent slow rods and Tech Spec 3.1.4 requires mode 3 in 12 hours. Part 2– Tech Spec 3.1.4 bases allows calling a slow control rod inoperable and performing the actions of TS 3.1.3 Condition C, when these actions are taken for any of the listed control rods in answer B and D Tech Spec 3.1.4 is meet.

A – Incorrect – Part-1 correct Part-2 Plausible in that this is partially correct however the control rod must be disarmed within 4 hours to meet the Tech Spec.

C – Incorrect – Part-1 Plausible in that the bases for Tech Spec 3.1.4 allows conservatively calling a slow Control Rod INOP but does not require doing so. Part-2 incorrect see A above.

D – Incorrect – Part 1 Incorrect see C above Part 2 correct see B above.

Technical Reference(s): Tech Spec 3.1.3 Amendment 212 and 3.1.4 Rev 212 and BASES, 3-TI-393 Rev 2

Proposed references to be provided to applicants during examination: Tech Spec 3.1.3 and 3.1.4 NO BASES, and the attached illustration

Learning Objective (As available): OPL171.005 ILT 14 and 32

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis : X
10 CFR Part 55 Content:	55.43 (b) (2)

QUESTION 92 Rev 1

Unit 2 is in MODE 1, performing TIP operations. Unit 2 scrams on high Drywell Pressure.

The attached Illustration **1** has the status of TIP A **post** scram.
The attached Illustration **2** has the status of TIP A during operator actions.

Which ONE of the following completes both statements below?

NOTE: Use Illustration **1** to answer part 1 and Illustration **2** to answer part 2.

For the indications given on Illustration **1**, the Unit Supervisor shall direct actions in accordance with __(1)__.

For the indications given on Illustration **2**, Primary Containment integrity __(2)__.

Illustrations Attached

A. (1) 2-AOI-64-2A, Traversing Incore Probe Isolation
(2) is met

B. (1) 2-AOI-64-2A, Traversing Incore Probe Isolation
(2) is NOT met

C. (1) 2-OI-94, Traversing Incore Probe System
(2) is met

D. (1) 2-OI-94, Traversing Incore Probe System
(2) is NOT met

Answer: **A**

Illustration 1

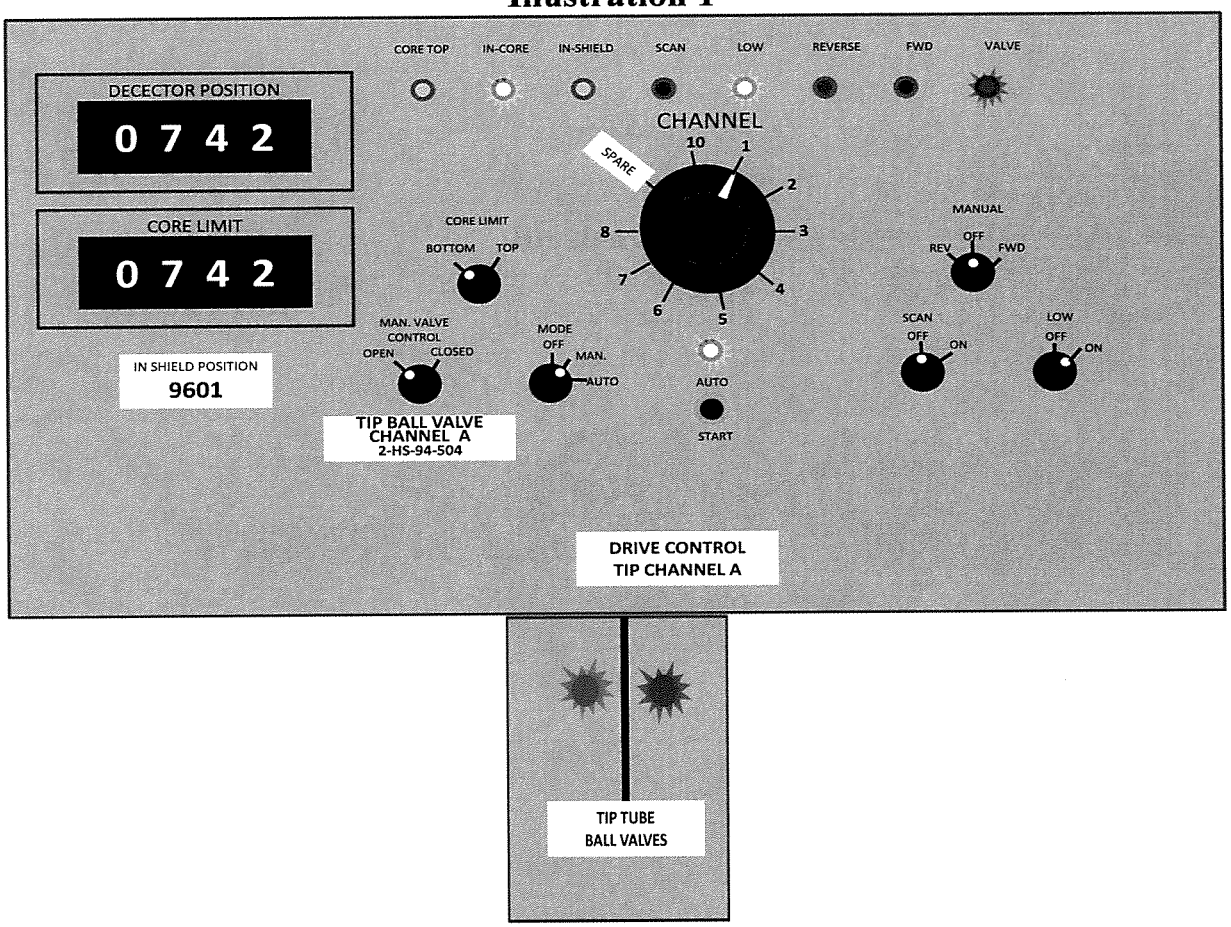
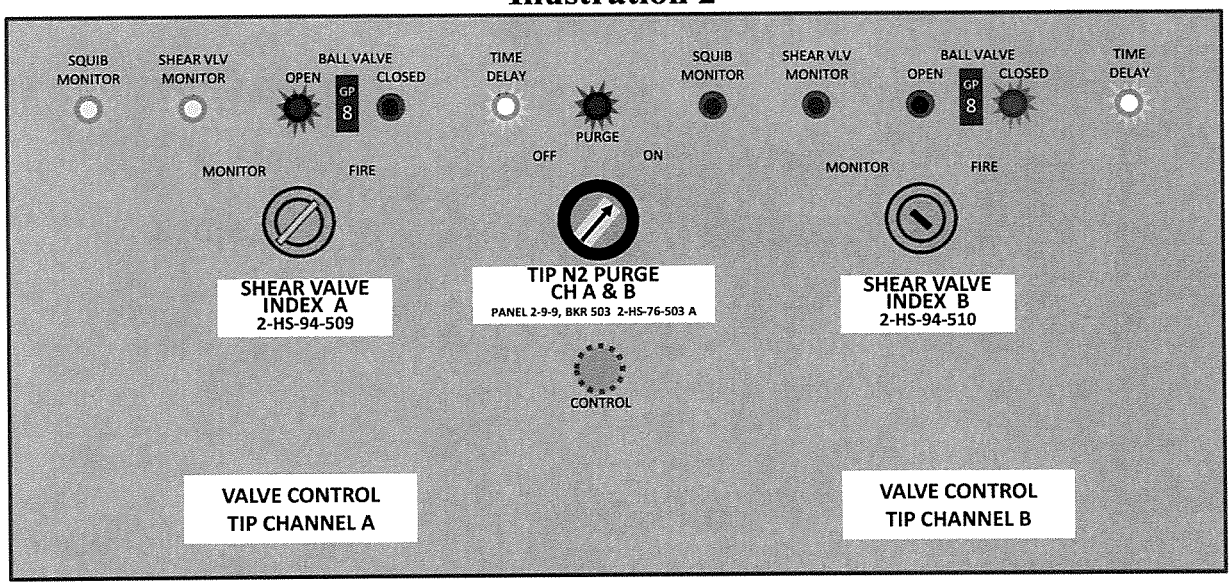


Illustration 2



Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	215001 G2.1.20	
	Importance Rating		4.6

215001 Traversing In-Core Probe System G2.1.20 Ability to interpret and execute procedure steps.

Explanation: **CORRECT A:** The correct procedure is the AOI and with the shear valves fired containment integrity IS MET.

B – Incorrect – Part one Correct. Part two Incorrect – plausible in that the indications on illustration 2 still show the ball valve open and the ball valve status light on the PCIS display on panel 9-3 shows dual indication.

C – Incorrect – Part one Incorrect – plausible in that all the steps in 2-AOI-64-2E are also in the OI for manually retracting a TIP, the steps that are NOT in the OI are the steps for firing the shear valves. Part Two Correct

D – Incorrect –Part One Incorrect see C above and Part two Incorrect see B above.

Technical Reference(s): 2-OI-94 Rev 36, 2-AOI-64-2E Rev 16, TS Bases 3.6.1.3 Rev 0, OPL171.023 Rev 6

Proposed references to be provided to applicants during examination: NONE

Learning Objective (As available): OPL171.023 V.B.2

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43 (b)(2)

6. Shear Valve (location TIP room RB El 565 NE quadrant)
   a. Purpose is to provide an emergency means of sealing a guide tube if:
      (1) The TIP dry tube (in-core) should leak AND
      (2) The TIP detector cannot be retracted preventing ball valve closure (e.g. power failure).
   b. Controlled by a key-lock switch on the valve control monitor drawer.
   c. Explosive valve
      (1) Squib detonation circuit
      (2) Two primers; two firing circuits; one indication circuit
   d. Cuts the cable and closes off the guide tube.

SR 3.6.1.3.4

The traversing incore probe (TIP) shear isolation valves are actuated by explosive charges. Surveillance of explosive charge continuity provides assurance that TIP valves will actuate when required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.

SR 3.6.1.3.9

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. The Frequency of 24 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the frequent checks of circuit continuity (SR 3.6.1.3.4).

QUESTION 93 Rev 1

Unit 3 is at 100% power.

A loss of RPS A occurs and actions of 3-AOI-99-1, Loss of Power to One RPS Bus are complete with the exception of restoring 3-RM-90-256 to service.

The 3-RM-90-256 DW Radiation Monitor Cam sample pump will not restart.

Which ONE of the following completes the statements below?

__ (1) __ for the DW Radiation Monitor CAM will automatically isolate.

In accordance with Tech Spec 3.4.5 the required action(s) is/are to __ (2) __.

NOTE: DW Radiation Monitor CAM Valve Noun Names

3-FCV-90-254A, DRYWELL LEAK DETN UPPER INBD ISOL VLV
3-FCV-90-254B, DRYWELL LEAK DETN UPPER INBD ISOL VLV
3-FCV-90-257B, DRYWELL LEAK DETN INBD ISOL VLV
3-FCV-90-255, DRYWELL LEAK DETN INTAKE OUTBD ISOL VLV
3-FCV-90-257A, DRYWELL LEAK DETN OUTBD ISOL VLV

REFERENCE PROVIDED

A. (1) ONLY the Inboard isolation valves
(2) analyze grab samples of primary containment atmosphere once per 12 hours and restore 3-RM-90-256 Cam to operable within 30 days

B. (1) ONLY the Inboard isolation valves
(2) analyze grab samples of primary containment atmosphere once per 12 hours only

C. (1) BOTH the Inboard and Outboard isolation valves
(2) analyze grab samples of primary containment atmosphere once per 12 hours and restore 3-RM-90-256 Cam to operable within 30 days

D. (1) BOTH the Inboard and Outboard isolation valves
(2) analyze grab samples of primary containment atmosphere once per 12 hours only

Answer: C

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		2
	Group #		2
	K/A#	272000 A2.02	
	Importance Rating		3.6

272000 Ability to (a) predict the impacts of the following on the Radiation Monitoring System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Reactor protection system power failure

Explanation: **CORRECT C:** All the isolation valves on the DW CAM close and Tech Spec 3.4.5 requires analyzing grab samples every 12 hours and restoring the cam to operable within 30 days..

A – Incorrect – Part one Incorrect – plausible in that RPS A powers only Inboard valves for some systems. Part two Correct.
B – Incorrect – Part one Incorrect see A above. Part two Incorrect – plausible in that several other Rad monitors can be out of service indefinitely as long as grab samples can be obtained and analyzed.
D – Incorrect – Part one Correct and Part two incorrect see B above

Technical Reference(s): 3-OI-99 Rev 52, Tech Spec 3.4.5 Amendment 212

Proposed references to be provided to applicants during examination: **Unit 3 Tech Spec 3.4.5**

Learning Objective (As available): OPL171033 V.B.2, OPL171.028 ILT 19 and 20

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge X Comprehension or Analysis :
10 CFR Part 55 Content:	55.43(b) (2)

QUESTION 94 Rev 3

According to the TRM basis for section 3.4.1 Coolant Chemistry which of the following completes the statements below concerning the bases for changing limits with steaming rates >100,000 lbm/hr.

The Reactor coolant chloride limit is relaxed from $\leq$0.1ppm to $\leq$0.2ppm. The bases for this change are boiling deaerates the coolant limiting the chance of __ (1) __.

The Reactor coolant conductivity limit changes from $\leq$ 2.0 µmho/cm to $\leq$1.0 µmho/cm. The bases for this change are the__ (2) __.

A. (1) stress cracking corrosion of stainless steel
(2) reactor water cleanup system is more efficient therefore, the conductivity limit is more stringent

B. (1) stress cracking corrosion of stainless steel
(2) reactor concentrates ionic impurities therefore, the conductivity limit is more stringent

C. (1) stress cracking corrosion of zircaloy
(2) reactor water cleanup system is more efficient therefore, the conductivity limit is more stringent

D. (1) stress cracking corrosion of zircaloy
(2) reactor concentrates ionic impurities therefore, the conductivity limit is more stringent

Answer: B

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.1.34	
	Importance Rating		3.5

Knowledge of primary and secondary plant chemistry limits.

Explanation: **CORRECT B:** Part 1– Chloride limits are specified to prevent stress corrosion cracking of stainless steel. Zircaloy, however, does not exhibit similar stress corrosion failures. Part 2- With steaming rates >100,000 lb/hr the reactor is now acting as a concentrator for ionic impurities and particulates, the conductivity limits are therefore made more stringent.

A – Incorrect – First part correct. Second part Incorrect, plausible in that the RWCU flow rate is higher at rated Reactor pressure than when depressurized however this is based on pressure not steam flow and the bases for TRM 3.4.1. indicate that RWCU may be more efficient at lower steam flow rates.

C – Incorrect – First part Incorrect, plausible in that the TRM bases states: Materials in the primary system are primarily 304 stainless steel and the Zircaloy cladding The reactor water chemistry limits are established to prevent damage to these materials. Zircaloy, however, does not exhibit similar stress corrosion failures. Second part Incorrect, see A above.

D – Incorrect – First part Incorrect, see C above. Second part Correct.

Technical Reference(s): TRM Bases 3.4.1 Rev 21

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.001 Rev. 16, ILT L.O. 1,2,4

Question Source:	Bank:	
	Modified Bank:	
	New:	X
Question History:	Previous NRC: NO	
Question Cognitive Level:	Memory or Fundamental Knowledge: X	
	Comprehension or Analysis :	

10 CFR Part 55 Content: 55.43 (b)(2)

Table 3.4.1-1
Coolant Chemistry Limits[1]

CHEMISTRY PARAMETERS	COLUMN A APPLICABLE CONDITION Prior To Startup And At Steaming Rates < 100,000 lb/hr	COLUMN B APPLICABLE CONDITION Steaming Rates > 100,000 lb/hr	COLUMN C APPLICABLE CONDITION Reactor Not Pressurized With Fuel In Reactor Vessel, Except During Startup Condition	COLUMN D[2] APPLICABLE CONDITION Noble Metal Chemical Application and Subsequent Reactor Coolant Cleanup	COLUMN E[3] APPLICABLE CONDITION Operation of HWC Following Noble Metal Chemical Application
CHLORIDE (ppm)	≤ 0.1	≤ 0.2	≤ 0.5	≤ 0.1	≤ 0.2
CONDUCTIVITY (μmho/cm at 25°C)	≤ 2.0	≤ 1.0	≤ 10.0	≤ 20.0	≤ 2.0
pH	5.6-8.6	5.6-8.6	5.3-8.6	4.3-9.9	5.6-8.8

(1) When there is no fuel in the reactor vessel, Technical Requirement reactor coolant chemistry limits do not apply.

(2) During the Noble Metal Chemical Application and subsequent reactor coolant cleanup, CONDITIONS A, B, C, and D (including Required Actions and Completion Times) do not apply.

(3) During operation of HWC following the Noble Metal Chemical Application, CONDITION A (including Required Action and Completion Time) does not apply.

QUESTION 95 Rev 2

Unit 2 is in MODE 1 with the following conditions:

- 2A Recirc Jet Pump Flow 42 Mlbm
- 2B Recirc Jet Pump Flow 36 Mlbm
- Core Flow 79.9 Mlbm

Which ONE of the following completes the statements below?

Based on the given value of Core Flow the 2A and 2B Jet Pump Flow mismatch must be within __ (1) __ of rated Core Flow?

The requirements of Tech Spec LCO 3.4.1 Recirculation Loops Operating __ (2) __ met for the given conditions.

	(1)	(2)
A.	10%	are
B.	10%	are not
C.	5%	are
D.	5%	are not

Answer: D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.1.7	
	Importance Rating		4.7

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

Explanation: **CORRECT D:** In accordance with 2-SR-3.4.2.1 Jet Pump Mismatch and Operability with Core Flow $\geq$ 70% the recirc loop jet pump flow mismatch must be $\leq$ 5.12 Mlb/hr (5% of rated core flow). The current mismatch is not within limits (42Mlb/hr-36Mlb/hr= 6Mlb/hr)(5.85% of rated core flow)

A – Incorrect – First and Second part Incorrect plausible that this is correct for a core flow of < 70%

B – Incorrect – First part Incorrect see A above. Second part Correct.

C – Incorrect – First Part Correct and second part Incorrect see A above.

Technical Reference(s): TS 3.4.1 Amendment 221 , TS Bases 3.4.1 Rev 25, 3-SR-3.4.2.1 Rev 37

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.007 Rev. 25, L.O. ILT 21

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge:
Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43 b (2) Facility operating limitations in the TS and their bases.

QUESTION 96

Which ONE of the following completes the statements below?

In accordance with NPG-SPP-07.1.4, Work Control Prioritization – On Line, emergency – priority 1 work requires the approval of the __(1)__.

In accordance with NPG-SPP-06.1, Work Order Process, if an emergency - priority 1 is assigned, the work order __ (2) __ required to be planned prior to the work commencing.

A. (1) Shift Manager
   (2) is

B. (1) Shift Manager
   (2) is NOT

C. (1) Plant Manager
   (2) is

D. (1) Plant Manager
   (2) is NOT

Answer: B

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.2.19	
	Importance Rating		3.4

Knowledge of maintenance work order requirements.

Explanation: **CORRECT B:** Shift Manager is the approving authority and the planning happens in conjunction with the work, or is not required to be completed prior to work beginning.

A – Incorrect – First part Correct. Second part Incorrect – plausible because All other work at BFN requires a planned work order with the exception of tool pouch maintenance which requires NO documentation.

C – Incorrect – First part Incorrect, plausible in that the Plant Manager must authorize work considered to be on energized equipment IAW NPG-SPP-10.2 Clearance Procedure.
Second part Incorrect see A above.

D – Incorrect – First part Incorrect see C above and second part Correct.

Technical Reference(s) NPG-SPP-07.1.4 Rev 3, Work Control Prioritization – On Line, NPG-SPP-06.1 Rev 2, Work Order Process

Proposed references to be provided to applicants during examination: None

Learning Objective (As available):

Question Source: Bank: Hatch 2007 #96
Modified Bank:
New:

Question History: Previous NRC: Hatch 2007 #96

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis :

10 CFR Part 55 Content: 55.43 (b)(3)

Hatch 200 7 NRC #96

96. G2.2.19 001
In accordance with 50AC-MNT-001-0, Maintenance Program, an MWO _____ required for emergency maintenance prior to performing work and normally can ONLY be authorized by the _____ or higher.

A. is / Emergency Director

B. is / Shift Supervisor

C. is NOT / Emergency Director

D. is NOT / Shift Supervisor

Updated CME 11/20/2007

A. Plausible but incorrect because MWO is normally required prior to work and is required after the emergency maintenance. If candidate does not know whose authorization is required, ED is plausible since it is considered an emergency.

B. Same analysis for first statement. Second statement is correct.

C. First statement is correct. Second statement has same analysis as A.

D. Correct.

QUESTION 97 Rev 2

To comply with Technical Specifications:

Which ONE of the following completes the statements below?

An RPS relay that has been declared INOP and placed in a tripped condition to comply with Tech Spec required actions may be returned to service __ (1) __ to demonstrate its operability.

This relay may also be returned to service to __ (2) __.

A. (1) under administrative control
   (2) demonstrate the operability of another RPS relay

B. (1) under administrative control
   (2) perform corrective maintenance

C. (1) in accordance with LCO 3.0.4
   (2) demonstrate the operability of another RPS relay

D. (1) in accordance with LCO 3.0.4
   (2) perform corrective maintenance

Answer: A

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.2.21	
	Importance Rating		4.1

2.2.21 Knowledge of pre and post-maintenance operability requirements.

Explanation: **CORRECT A**: In accordance with LCO 3.0.5 Inoperable equipment may be returned to service under administrative control solely to perform testing required to demonstrate its operability or operability of other equipment.

B – Incorrect – First part – Correct. Second part – Incorrect, plausible that returning the relay to service under administrative control to allow corrective maintenance would be acceptable however that is not the case.

C – Incorrect – First part Incorrect– plausible in that this allowance comes from Tech Spec 3.0 section however LCO 3.0.5 provides the allowance as an exception to LCO 3.0.2.
Second Part – Correct.

D – Incorrect – First Part Incorrect – see C above – second part Incorrect – see B above

Technical Reference(s): TS 3.0.5 Amendment 226 and Bases Rev 0

Proposed references to be provided to applicants during examination: None

Learning Objective (As available):

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: NO

Question Cognitive Level: Memory or Fundamental Knowledge: X
Comprehension or Analysis :

10 CFR Part 55 Content: 55.43 b (2)

QUESTION 98 Rev 2

A release is in progress and the following observations and reports are made:

- Stack WRGERMS are reading 7.1 X 10^9 μCi/sec and have been for 20 minutes.
- Site Boundary Radiation Reading from the Field Assessment Team is 1.0 REM/HR TEDE lowering slowly for that same 20 minutes.

What EAL is required to be made?

Reference Provided

A. Unusual Event per 4.1-U

B. Alert per 4.1-A

C. Site Area Emergency per 4.1-S

D. General Emergency per 4.1-G

Answer: C

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.3.14	
	Importance Rating		3.8

Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.

Explanation: **CORRECT C:** In accordance with EPIP-1 Section 4.0, the NOTES on page 40 4.1-G Prior to making this emergency classification based upon the gaseous release rate indication, assess the release by either of the following methods:
1. Actual field measurements exceed the limits in table 4.1-G.
2. Projected or actual dose assessments exceed 1000 mrem TEDE or 5000 mrem CDE.

If neither assessment can be conducted within 15 minutes then the declaration must be made based on the valid WRGERMS reading. Since the valid WRGERM is not above the general emergency level but is above that of the Site Area Emergency that is the EAL that is required to be declared.

A. incorrect - Since the Gaseous release exceeds ANY limit and duration in Table 4.1U this is plausible but incorrect because a higher classification supersedes this declaration.

B. incorrect - Since the Gaseous release exceeds ANY limit and duration in Table 4.1A this is plausible but incorrect because a higher classification supersedes this declaration.

D. incorrect – Plausible since the Site Boundary Radiation reading exceeds the limit, however it doesn't exceed the duration. The Note on the previous page says to use the WRGREM reading over field readings. Also, the Gaseous Release is lower than the limit.

Technical Reference(s): EPIP-1 Section 4.0

Proposed references to be provided to applicants during examination: **EPIP-1 Section 4.0**

Learning Objective (As available):

Question Source:	Bank: Modified Bank: New: X
Question History:	Previous NRC: None
Question Cognitive Level:	Memory or Fundamental Knowledge Comprehension or Analysis : X

10 CFR Part 55 Content: 55.43 (b) (4)

QUESTION 99 Rev 1

Which ONE of the following completes both statements below?

The Shift Manager has directed entry to 0-SSI-2-5, U-2 RX BLDG FIRE EL 621 & 639 North of Column Line R. On the **subsequent** reactor scram, if an EOI entry condition is met, the Unit Supervisor __(1)__ enter the EOI.

The SSIs contain a Critical Equipment Checklist. In the event that a piece of equipment on the Critical Equipment Checklist fails, the operators __(2)__ to align **alternate path** equipment for service.

A. (1) will
(2) may ONLY use SSIs

B. (1) will
(2) may use either an AOI or EOI

C. (1) will NOT
(2) may ONLY use SSIs

D. (1) will NOT
(2) may use either an AOI or EOI

Answer: D

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.4.11	
	Importance Rating		4.2

Knowledge of abnormal condition procedures.

Explanation: **CORRECT D**: For the given the SSI entry into the EOIs will NOT be permitted, EOIs are superseded. AOIs and EOIs may be utilized as a reference to align alternate path equipment for service.

A – Incorrect – First part Incorrect – plausible because this is correct for 0-SSI-25-1, 0-SSI-25-2, 0-SSI-25-3 and 0-SSI-26. Second part Incorrect – plausible because the SSI provides most of the guidance for aligning the plant, but for aligning specific equipment for service say HPCI for injection the operator may reference the AOI or EOI.

B – Incorrect – First part Incorrect see A above and second part Correct

C – Incorrect – First part Correct and Second part Incorrect see A above

Technical Reference(s) 0-SSI-1 Rev 31

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.031 ILT 6

Question Source: Bank:
Modified Bank: BFN Bank
New:

Question History: Previous NRC: NO

Question Cognitive Level: Memory or Fundamental Knowledge: X
Comprehension or Analysis :

10 CFR Part 55 Content: 55.43 (b)(5)

QUESTION 100 Rev. 1

In accordance with the Emergency Classification Procedure, if an Emergency Action Level (EAL) was exceeded but the emergency has been totally resolved (prior to declaration), the emergency condition that was appropriate ___(1)____.

The fact that an EAL was exceeded, even if it has been totally resolved, would still need to be reported to the NRC within ____ (2) ____.

A. (1) should NOT be declared
   (2) one hour

B. (1) should be declared
   (2) one hour

C. (1) should be declared
   (2) four hours

D. (1) should NOT be declared
   (2) four hours

Answer: A

Examination Outline Cross-Reference	Level:	RO	SRO
	Tier #		3
	Group #		
	K/A#	G2.4.29	
	Importance Rating		4.4

2.4.42 Knowledge of the emergency plan.

Explanation: **CORRECT A**: If an EAL was exceeded, but the emergency has been totally resolved (prior to declaration), the emergency condition that was appropriate shall not be declared but reported to the NRC within one hour using NPG-SPP-03.5, Regulatory Reporting Requirements.

B – Incorrect – First part Incorrect plausible if is thought the EAL would immediately be reclassified at a lower level. Second part Correct.

C – Incorrect – First part Incorrect see A above. Second part Incorrect plausible as a four hour report is the next higher reporting level.

D – Incorrect – First part Correct and Second part Incorrect see C above.

Technical Reference(s): EPIP-1 Rev 49, SPP-3.5 App. A Rev 10

Proposed references to be provided to applicants during examination: None

Learning Objective (As available): OPL171.075 Rev. 27, ILT L.O. 7

Question Source: Bank:
Modified Bank:
New: X

Question History: Previous NRC: None

Question Cognitive Level: Memory or Fundamental Knowledge: X
Comprehension or Analysis :

10 CFR Part 55 Content: 55.43 (b)(5)