TURKEY POINT DRAFT NRC EXAM – 11/09/08

Q #1 007EK2.03

Reactor and turbine power are stable at 20%.

Operators have positioned the Reactor Trip and Bypass breakers to test Train "A" reactor protection logic in accordance with 4-OSP-049.1, "Reactor Protection System Logic Test."

- Turbine thrust bearing oil pressure increases to 77 psig.

The RO observes the following on the console:

- RTA: Green Light
- RTB: Red Light
- BYA: Red Light
- BYB: No Light

The reactor is _____ and the RO _____ required to manually initiate a reactor trip signal.

A. tripped
is

B. tripped
is NOT

C. NOT tripped
is

D. NOT tripped
is NOT

NOTE:

RO:	Reactor Operator
RTA:	Reactor Trip Breaker A
RTB:	Reactor Trip Breaker B
BYA:	Bypass Trip Breaker A
BYB:	Bypass Trip Breaker B
psig:	pounds per square inch gauge

Q #1

ANSWER: C

KA: 007EK2.03
Knowledge of the interrelations between a reactor trip and the reactor trip status panel.
10CFR55: 41.7
Reference: 4-OSP-049.1, "Reactor Protection System Logic Test" Section 7.1
5610-T-L1, Sheet 2, 5610-T-L1, Sheet 3, 4-EOP-E-0, Step 1

Cog Level: 2 Comprehension
Level 2 because the operator has to recall the correct configuration and positioning of the trip and bypass breakers while performing Train "A" testing. The operator must also know that thrust-bearing pressure exceeding 75 psig is a turbine trip signal, which will trip the reactor if power is greater than 10%. The operator must then examine the current breaker status and determine the reactor is not tripped. Finally the operator must know that a manual trip is required because power is above P-7 (10%) and the turbine trip signal should have opened RTB and BYA.

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New Question
Response Analysis:

A. Incorrect because the reactor is not tripped. Plausible because the red/green light configuration is unusual for both power operation and for post-trip. Also plausible because regardless of whether the reactor is tripped or not, the RO is required to manually trip the reactor if an initiating signal exists and any trip breakers have not opened.

B. Incorrect because the reactor is not tripped and the operator is required to manually initiate a reactor trip signal. Plausible because the red/green light configuration is unusual for both power operation and for post-trip and if the operator concludes the reactor is tripped, then the operator may feel that initiating a manual trip signal is unnecessary.

C. Correct because the turbine thrust bearing oil pressure exceeding 75 psig will cause a turbine trip, closing the turbine stop valves. Because power is at 20% (above permissive P-7) the stop valve closure should initiate a reactor trip signal. The operator is required to manually initiate a reactor trip signal IAW Step 1 RNO of 4-EOP-E-0 because two trip breakers remain closed (RTB and BYA). Prior to the event, operators repositioned the reactor trip and bypass breakers IAW OSP-049.1 causing BYA and RTB to be initially closed, BYB to be racked out/open and RTA to be racked in and open. Red light indication on RTB and BYA implies the reactor has not tripped.

D. Incorrect because the RO is required to manually trip the reactor. Plausible because the reactor is not tripped.

Q #2 008AG2.2.44

Unit 4 was at 90% power when Pressurizer Pressure Transmitter, PT-4-445, failed high.

Following manual closure of the associated Pressurizer PORV, the RO noted the following indications:

- RCS pressure is 2100 psig and decreasing.
- The PORV indicating lights on the console are green.
- The associated PORV block valve indicating lights are NOT lit.

Which ONE of the following describes the operator action(s) directed by 4-ONOP-041.5?

A. Take manual control of PC-4-444J to fully close the Pressurizer PORV.

B. Take manual control of PC-4-444J to fully close the Pressurizer spray valves.

C. With Shift Manager permission, reclose the breaker for the associated block valve and then close the associated block valve.

D. Notify the Electrical Department of the block valve malfunction and continue with the subsequent steps of 4-ONOP-041.5.

NOTE:

RO:	Reactor Operator
RCS:	Reactor Coolant System
PORV:	Power Operated Relief Valve
psig:	pounds per square inch gauge
4-ONOP-041.5:	"Pressurizer Pressure Control Malfunction"
PC-4-444J:	Pressurizer Pressure Controller

Q #2

ANSWER: C

KA: 008AG2.2.44

As it relates to the Pressurizer Steam Space Accident event: Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. 4.2/4.4

10CFR55: 41.5, 43.5

Reference: 4-ONOP-041.5 Steps 1, 3 and 14.RNO
5610-T-D-16B, Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that the failure of PT-445 affects only one PORV (unlike PT-444 failure which affects the other PORV and both pressurizer spray valves). Note that response A would be correct for the PT-444 failure. Then the operator must recall the guidance given in Step 14 of ONOP-041.5.

New Question

Response Analysis:

A. Incorrect because the RO is directed to reclose the breaker for the associated block valve and then close the associated block valve after obtaining Shift Manager permission. Plausible because taking manual control of the Pressurizer Pressure Controller, PC-4-444J, to close the pressurizer PORV would be a diverse method of shutting the PORV if the other pressure transmitter (PT-444) had failed.

B. Incorrect because the RO is directed to reclose the breaker for the associated block valve and then close the associated block valve after obtaining Shift Manager permission. Plausible because taking manual control of the Pressurizer Pressure Controller, PC-4-444J, to close the pressurizer spray valves would be a diverse method of closing the spray valves if the other pressure transmitter (PT-444) had failed.

C. Correct because Step 14 RNO of 4-ONOP-041.5 directs the operator to reclose the breaker for the associated block valve and then close the associated block valve after obtaining Shift Manager permission.

D. Incorrect because the associated PORV block valve indicating lights are NOT lit. With the lights not lit the operators may reclose the breaker with Shift Manager permission without notifying the Electrical Department. Plausible because this would be the correct action to take per Step 14 if the indicating lights were lit.

Q #3 009EA2.06

Unit 3 is at 100% power.

- 3A Charging Pump is running.
- 3C Charging Pump is out of service.
- During their last inservice test, 3A and 3B Charging Pumps delivered flow at their minimum acceptable flowrates.

A 160 gpm leak occurs on 3A RCS Loop.

- The RO isolates letdown and maximizes charging flow.

Pressurizer level will _____ and the operators will _____.

A. stabilize.
continue to respond to the leakage using 3-ONOP-041.3.

B. stabilize.
transition to 3-EOP-E-0.

C. continue to decrease.
continue to respond to the leakage using 3-ONOP-041.3.

D. continue to decrease.
transition to 3-EOP-E-0.

NOTE:

RCS:	Reactor Coolant System
RO:	Reactor Operator
gpm:	gallons per minute
3-ONOP-041.3:	"Excessive Reactor Coolant Leakage"
3-EOP-E-0:	"Reactor Trip or Safety Injection"

Q #3

ANSWER: D

KA: 009EA2.06

Able to determine or interpret following as they apply to a small break LOCA: Whether pressurizer water inventory loss is imminent. 43.8/4.3

10CFR55: 43.5

Reference: 3-ONOP-041.3 Steps 1-5
3-OSP-047.1, Attachment 1, Step 18a & Attachment 2, Step 18a

Cog Level: 3 Analysis
Level 3 because the operator must recall that the minimum acceptable flowrate for a charging pump is 77 gpm. Two charging pumps can deliver 154 gpm. Of that 154 gpm, 9 gpm is lost to the RCP #1 seals. The remaining 145 gpm is available to replenish letdown and RCS leakage. Letdown is isolated and charging flow is maximized in 3-ONOP-041.3. Therefore 2 charging pumps can keep up with RCS leakage equal to 145 gpm after the initial actions of 3-ONOP-041.3 are complete. Because the RCS leakage is 160 gpm, the charging pumps cannot keep up and pressurizer level will continue to decrease. Operators are directed to trip the reactor and transition to 3-EOP-E-0.

New Question

Response Analysis:

A. Incorrect because pressurizer level will not stabilize. Plausible, because if pressurizer level did stabilize, operators would continue to respond to the leakage using 3-ONOP-041.3.

B. Incorrect because pressurizer level will not stabilize. Plausible because the given conditions will result in other symptoms of a SBLOCA (containment pressure, radiation, sump level, etc) and operators expect to deal with a SBLOCA using the EOP network.

C. Incorrect because if pressurizer level continue to decrease, operators will trip the reactor and transition to 3-EOP-E-0, "Reactor Trip or Safety Injection." Plausible because pressurizer level will continue to decrease.

D. Correct per the references and the level 3 discussion above.

Q #4 015AA2.08

The following RCP bearing temperatures are observed during an 3-ONOP-041.1, "Reactor Coolant Pump Off-Normal," response:

	Mtr. Brng. Temp.	Pmp. Brng. Temp.	#1 Seal Leak-off Temp.
3A RCP	190°F	230°F	220°F
3B RCP	200°F	205°F	230°F
3C RCP	190°F	220°F	225°F

Which ONE of the following describes the correct operator response based on these RCP temperatures?

Trip the reactor and then trip:

A. 3A RCP based on high pump bearing temperature and
3C RCP based on high pump bearing temperature.

B. 3B RCP based on high #1 Seal Leak-off temperature and
3C RCP based on high #1 Seal Leak-off temperature.

C. 3A RCP based on high pump bearing temperature and
3B RCP based on high motor bearing temperature.

D. 3A RCP based on high pump bearing temperature and
3B RCP based on high #1 Seal Leak-off temperature.

NOTE:

RCP:	Reactor Coolant Pump
°F:	degrees Fahrenheit
Mtr:	Motor
Pmp:	Pump
Brng:	Bearing
Temp:	Temperature

Q #4

ANSWER: C

KA: 015AA2.08

Ability to determine and interpret the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC Flow): When to secure RCPs on high bearing temperature. 3.4/3.5

10CFR55: 43.5

Reference: 3-ONOP-041.1, Fold-out Page, Item 2

Cog Level: 1 Recall

New Question

Response Analysis:

Note that an RCP should be tripped when:
motor bearing temp exceeds 195°F
pump bearing temp exceeds 225°F or
#1 seal leak-off temp exceeds 235°F.

A. Incorrect because the 3C RCP pump bearing temperature is below the trip limit. Plausible because the 3A RCP pump bearing temperature is above the trip limit.

B. Incorrect because neither the 3B or 3C RCPs are above the #1 seal leak-off trip limits. Plausible because both the 3B and 3C RCPs temps are above the 3A #1 seal leak-off temp and both are near the trip limit.

C. Correct because the 3A RCP exceeds the pump bearing temperature limit and 3B RCP exceeds the motor bearing temperature limit.

D. Incorrect because the 3B RCP #1 seal leak-off temp is below the trip limit. Plausible because the 3B RCP has the highest #1 seal leak-off temperature and because 3A RCP pump bearing temperature is above the trip limit.

Q #5 022AK1.02

Unit 3 is at 100% power.

- Charging pump flow decreases to zero over a several minute period as a result of a leak in the Charging pump discharge header.

Which ONE of the following describes the effect of this decrease in charging flow on the value of ΔP between the charging flow path and the RCS?

The absolute value of ΔP between Charging and the RCS will:

A. remain unchanged.

B. continuously increase.

C. continuously decrease.

D. decrease and then increase.

NOTE: ΔP: differential pressure
RCS: Reactor Coolant System

Q #5

ANSWER: D

KA: 022AK1.02

Knowledge of the operational implications of the relationship of charging flow to pressure differential between charging and the RCS as they apply to the loss of Reactor Coolant Makeup. 2.7/3.1
10CFR 55: 41.8, 41.10

Reference: 5613-M-3047, Sheet 2

Cognitive Level: 2 Comprehension
Level 2 because the operator must understand that for flow to travel from the charging pumps to the RCS, there has to be a differential pressure between the charging pump discharge header and the RCS. The discharge pressure of the Charging pumps is higher than the RCS pressure at the loop penetration. Therefore the ΔP between the higher charging header pressure and slightly lower pressure RCS is positive. The suction line leak results in a loss of reactor coolant makeup. Lower flow results in pressure in the discharge header decreasing. This initially lowers the positive ΔP and subsequently reverses it.

New Question
Response Analysis:

A. Incorrect because the ΔP between the charging flow path and the RCS will decrease and then increase. Plausible if the operator is not aware of the existence check valves downstream of valves CV-310A and CV-310B that will close during this event, preventing the RCS from maintaining the charging pressure at RCS pressure.

B. Incorrect because the ΔP between the charging flow path and the RCS will decrease and then reverse. Plausible if the operator does not know that the charging path's pressure is normally higher than the RCS pressure. If RCS pressure was initially higher, the ΔP would continuously increase.

C. Incorrect because the ΔP between the charging flow path and the RCS will decrease and then reverse. Plausible if the operator confuses pressure (which will continuously decrease) with ΔP which will decrease and then increase.

D. Correct per the references and discussion above. ΔP will decrease and then increase.

Q #6 025AG2.4.46

Unit 3 is in Mode 5 with the RCS in a water-solid condition.

The following annunciators alarm:

A 3/2 OMS HI PRESS ALERT
A 3/3 OMS CONTROL ACTIVATED
A 4/1 PORV/SAFETY VALVE OPEN
A 9/6 RHR MOV-750/751 LETDOWN ISOLATION
H 6/2 RHR HX HI/LO FLOW

Which ONE of the following describes the event that caused these alarms?

A. FT-3-605 has failed high resulting in closure of FCV-3-605.

B. PC-3-600 has failed high resulting in closure of MOV-3-862B.

C. PT-3-403 has failed high resulting in closure of MOV-3-750.

D. PT-3-405 has failed high resulting in opening PCV-3-456.

NOTE:		
	PORV:	Power Operated Relief Valve
	RHR:	Residual Heat Removal
	FT-3-605:	RHR Loop Flow Transmitter
	PC-3-600:	RHR Pump 3B Pressure Comparator
	PT-3-403:	RCS Loop Pressure Transmitter
	PT-3-405:	RCS Loop Pressure Transmitter
	FCV-3-605:	RHR Heat Exchanger Bypass Flow Valve
	MOV-3-862B:	RHR Suction From RWST
	MOV-3-750:	Loop 3C RHR Suction Stop Valve
	PCV-3-456:	Pressurizer PORV

Q #6

ANSWER: C

KA: 025AG2.4.46

As it relates to the Loss of RHR system, ability to verify that the alarms are consistent with the plant conditions 4.2/4.2

10CFR55: 41.10, 43.5

Reference: 5610-T-L1, Sheet 27
5610-T-D-16A, Sheet 1
3-ONOP-050, Section 2.1, Step 2.2.2, 2.2.3
3-ARP-097.CR - A3/2, A3/3, A4/1, A9/6, H6/2

Cognitive Level: 2 Comprehension
Level 2 because the operator must recall that PT-403 has input to both the OMS actuation logic and the MOV-750 auto-closure logic. With the RCS water solid, the closure of MOV-750 separates the RHR system from the RCS and stops the RHR flow. Letdown comes from the RHR, but charging goes into the RCS. A rapid RCS pressure transient would occur except that the PT-403 failure also actuated OMS (opening PORV, PCV-3-456) causing the OMS alarms.

New Question

Response Analysis:

A. Incorrect because FT-605 failing high would not result in annunciators A9/6, A3/2, A3/3, A4/1. Plausible because FT-605 failing high would result in annunciator H6/2.

B. Incorrect because PC-600 failing high would not result in the annunciators listed. Plausible because PC-600 is interlocked with RHR MOV-3-862B and will trigger annunciator H7/2 if it fails high.. Also MOV-862B is interlocked with MOV-3-751.

C. Correct because PT-403 will result in all of the listed annunciators alarming per the discussion above.

D. Incorrect because PT-405 failing high will result in the opening of PORV PCV-455C, not PCV-456. Plausible because PT-405 failing high will result in all of the listed annunciators alarming.

Q #7 026AA2.06

Unit 3 is at 100% power.

- A complete loss of CCW flow occurs.

Which ONE of the following describes why operators are directed to establish one charging pump running at maximum speed?

A. Operating a charging pump at normal speed without CCW cooling may result in excessive coupling oil temperatures within 20 seconds.

B. Maximum charging flow is required to provide adequate cooling to the RCP seal packages during a loss of all CCW.

C. Maximum charging flow will result in Pressurizer level rising above program to allow for RCS shrinkage during the subsequent plant cooldown.

D. With CCW flow through the Non-regenerative heat exchanger lost, charging flow through the Regenerative heat exchanger is increased to prevent flashing.

NOTE: CCW: Component Cooling Water
RCP: Reactor Coolant Pump
RCS: Reactor Coolant System

Q #7

ANSWER: A

KA: 026AA2.06

Ability to determine and interpret the length of time after the loss of CCW flow to a component before that component may be damaged as it applies to the Loss of Component Cooling Water 2.8/3.1

10CFR55: 43.5

Reference: 3-ONOP-030, FO Page, Item 1.C
3-ONOP-030, CAUTION prior to Step 22
3-BD-ONOP-030, Page 16, Foldout 1

Cog Level: 1 Recall

Modified from Bank: 69022290501

Response Analysis:

A. Correct per the listed references.

B. Incorrect because the Charging pump is run at maximum speed to prevent over heating the Charging pump coupling oil. Plausible because CCW cooling has been lost to the RCP thermal barriers. However normal seal injection flow rates are adequate to cool the seal packages.

C. Incorrect because the Charging pump is run at maximum speed to prevent over heating the Charging pump coupling oil. Plausible because a subsequent plant natural circulation cooldown is likely if CCW cannot be restored.

D. Incorrect because the Charging pump is run at maximum speed to prevent over heating the Charging pump coupling oil. Plausible because CCW flow has been lost to the Non-regenerative heat exchanger.

Q #8 029EG2.4.4

Unit 3 is at 100% power.

- An RCS leak occurs.
- Pressurizer pressure is 1975 psig and decreasing.
- Pressurizer level is 10% and decreasing.
- Step 1 of 3-EOP-E-0 is in progress.
- Efforts to manually trip the reactor are unsuccessful.

Which ONE of the following describes the correct operator response?

A. Continue with Step 2 of 3-EOP-E-0, and manually initiate SI.

B. Transition to 3-EOP-FR-S.1 and manually initiate SI.

C. Continue with Step 2 of 3-EOP-E-0 and DO NOT manually initiate SI.

D. Transition to 3-EOP-FR-S.1 and DO NOT manually initiate SI.

NOTE:		
	RCS:	Reactor Coolant System
	SI:	Safety Injection
	3-EOP-E-0:	"Reactor Trip or Safety Injection"
	3-EOP-FR-S.1:	"Response to Nuclear Power Generation/ATWS

Q #8

ANSWER: D

KA: 029EG2.4.4

As it relates to the ATWS event, Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures 4.5/4.7

10CFR55: 41.10, 43.2

Reference: 3-EOP-E-0, Step 1 RNO

Cog Level: 1 Recall

Modified from NRC Exam - Group 21, 2004

Response Analysis:

A. Incorrect because the crew has been unsuccessful in manually tripping the reactor. 3-EOP-E-0, Step 1 RNO directs transition to FR-S.1. Plausible to remain in E-0 because none of the automatic reactor trip setpoints have been reached and plausible because the automatic SI actuation setpoints are being approached and SI will provide another automatic reactor trip signal.

B. Incorrect because the crew should not manually initiate SI after transitioning to FR-S.1. Plausible because the crew must immediately transition to FR-S.1 per E-0 Step 1 RNO. Note that FR-S.1 has no foldout page to direct manual SI actuation. The only SI guidance in FR-S.1 is to verify SI equipment alignment per E-0 if an SI signal occurs. Also plausible because primary parameters are deteriorating toward values that will call for SI actuation.

C. Incorrect because the crew must immediately transition to FR-S.1. Plausible because the primary parameters have approached but not yet reached the values that would require SI actuation.

D. Correct because the crew must immediately transition to FR-S.1. FR-S.1 has no instructions for manually initiating SI, only to verify SI equipment alignment per E-0 if an SI signal occurs.

Q #9 040AK1.04

Operators are responding to an uncontrolled depressurization of all SGs on Unit 4.

- RCS Cold Leg temperatures have decreased from 547°F to 400°F in the past 15 minutes.
- The RO is preparing to reinitiate feed flow to the SGs.

Which ONE of the following describes how much feed flow will be reestablished to the SGs and the basis for these actions?

Initially establish:

A. 25 gpm flow to <u>each</u> SG.
Feed flow is required to be initiated slowly to avoid unacceptable thermal stress on the reactor vessel and SGs.

B. 25 gpm total flow to <u>all</u> SGs.
Feed flow is required to be initiated slowly to avoid unacceptable thermal stress on the reactor vessel and SGs.

C. greater than 345 gpm to <u>each</u> SG.
345 gpm is the minimum safeguards AFW flow required for heat removal plus normal channel accuracy.

D. greater than 345 gpm total flow to <u>all</u> SGs.
345 gpm is the minimum safeguards AFW flow required for heat removal plus normal channel accuracy.

NOTE:

SGs:	Steam Generators
RO:	Reactor Operator
AFW:	Auxiliary Feedwater
gpm:	gallons per minute
°F:	degrees Fahrenheit

Q #9

ANSWER: A

KA: 040AK1.04

Knowledge of the operational implications of Nil ductility temperature as it applies to the Steam Line Rupture. 3.2/3.6

10CFR55: 41.8, 41.10

Reference: 4-EOP-ECA-2.1, Step 3
BD-EOP-ECA-2.1 CAUTION prior to Step 3

Cog Level: 1 Recall

Modified from Bank: 69023350201

Response Analysis:

A. Correct because an excessive RCS cooldown has occurred and RCS vessel integrity has been challenged. Additional challenge is avoided by significantly limiting the additional addition of feedwater to the SGs.

B. Incorrect because ECA-2.1 directs the initiation of 25 gpm to each SG. Plausible because the normal procedural guidance (ex. EOP-E-0) is a minimum flowrate (345 gpm) for all SGs. Additionally feed flow is required to be initiated slowly to avoid unacceptable thermal stress on the reactor vessel.

C. Incorrect because ECA-2.1 directs the initiation of 25 gpm to each SG. Plausible because 345 gpm is the flowrate number that would apply if only one or two SGs had faulted and the basis given is correct for the normal 345 gpm limit.

D. Incorrect because ECA-2.1 directs the initiation of 25 gpm to each SG. Plausible because 345 gpm is the flowrate number that would apply if only one or two SGs had faulted and the basis given is correct for the normal 345 gpm limit.

Q #10 054AK1.02

3A SG main feed line ruptured at the Containment penetration resulting in a complete loss of main feedwater flow to the 3A SG.

- Following SI actuation operators isolate AFW flow to the 3A SG.

Which ONE of the following describes subsequent SG conditions and operator actions and their bases regarding re-initiation of feedwater flow to the 3A SG?

3A SG will:

A. blow dry. Operators will re-initiate feedwater at a rate not to exceed 100 gpm to 3A SG to minimize energy release and RCS cooldown.

B. blow dry. Operators will NOT re-initiate feedwater to 3A SG to prevent thermal stress on the SG.

C. NOT blow dry. Operators will NOT re-initiate feedwater flow to 3A SG to ensure adequate AFW flow capability to the intact SGs.

D. NOT blow dry. Operators will re-initiate feedwater flow to 3A SG at any rate that will ensure adequate RCS heat sink.

NOTE:

SG:	Steam Generator
SI:	Safety Injection
AFW:	Auxiliary Feedwater
gpm:	gallons per minute

Q #10

ANSWER: B

KA: 054AK1.02

Knowledge of the operational implications of the effects of feedwater introduction on a dry steam generator as it applies to the Loss of Main Feedwater. 3.6/4.2

10CFR55: 41.8, 41.10

Reference: BD-EOP-FR-H.5, Step 4BD
5613-M-3074, Sheet 3

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because operators will not re-initiate feedwater flow to a faulted SG. Plausible because operators could reintroduce feedwater flow to an empty/non-faulted SG at a rate not to exceed 100 gpm.

B. Correct because the SG will blow dry and because operators will not re-initiate feedwater flow to a faulted SG.

C. Incorrect because the SG will blow dry and because AFW flow capability is not an issue during this event. Plausible because operators will NOT re-initiate feedwater flow to 3A SG

D. Incorrect because the SG will blow dry and because operators will not re-initiate feedwater flow to a faulted SG. Plausible because operators are allowed to initiate feed flow to a SG with inventory at any rate to ensure adequate heat sink.

Q #11 055EK2.04

Both units are at 100% power.

- The Turkey Point switchyard de-energizes.
- Both 3A and 3B EDGs lockout and cannot be restarted.

Which ONE of the following describes the correct operator response regarding operation of HHSI pumps?

Unit 3 Operators will:

A. maintain all four HHSI pumps control switches in AUTO.

B. place all four HHSI pumps control switches in Pull-To-Lock.

C. place Unit 3 HHSI pumps control switches in Pull-To-Lock and will maintain Unit 4 HHSI pumps control switches in AUTO.

D. maintain Unit 3 HHSI pumps control switches in AUTO and will place Unit 4 HHSI pumps control switches in Pull-To-Lock.

NOTE: EDGs: Emergency Diesel Generators
HHSI: High Head Safety Injection

Q #11

ANSWER: C

KA: 055EK2.04

Knowledge of the interrelations between station blackout and pumps ??/??

10CFR55: 41.7

Reference: 3-EOP-ECA-00, Steps 11 and 12
3 & 4-NOP-030, CAUTION prior to Step 5.3.1

Cog Level: 2 Comprehension
Level 2 because the operator must recognize that this event is a Loss of All AC on Unit 3 only. Therefore the Unit 3 HHSI pumps have no power and no CCW so they are put in PTL in Step 11 of ECA-0.0. Unit 4 HHSI pumps have power from their EDGs and can run and their CCW is supplied from Unit 4. For this reason, the Unit 4 CCW pumps are left in AUTO.

New Question

Response Analysis:

A. Incorrect because Unit 3 HHSI Pumps control switches are placed in PTL. Plausible because the HHSI pumps control switches normal position is AUTO and the Unit 3 operators are aware that the Unit 3 pumps cannot auto-start. Additionally the Unit 4 HHSI pumps are kept in AUTO for the reasons discussed above.

B. Incorrect because Unit 4 HHSI pumps control switches are left in AUTO. Plausible because the Unit 3 HHSI pumps control switches are placed in PTL and all four HHSI pumps control switches would be placed in PTL if Unit 4 was in Mode 5 or 6.

C. Correct per the references and discussion above. Unit 3 operators will place Unit 3 HHSI pumps control switches in PTL and will maintain Unit 4 HHSI pumps control switches in AUTO.

D. Incorrect because Unit 3 HHSI Pumps control switches are placed in PTL and because Unit 4 HHSI pumps control switches are left in AUTO. Plausible if the operator reverses which pumps are placed in PTL and which pumps are maintained in AUTO.

Q #12 056AA1.25

Unit 4 is at 100% power.

- Unit 4 Startup Transformer is out of service.
- The 4B MSIV fails closed.

Which ONE of the following describes the correct operator response?

A. Manually run back the turbine until power is 45%.

B. Manually run back the turbine until power is 60%.

C. Trip the reactor. If a cooldown occurs, place all of the MSIV control switches to CLOSE.

D. Trip the reactor. If a cooldown occurs, place the Steam Dump Mode Selector switch to MAN.

NOTE: MSIV: Main Steam Isolation Valve

Q #12

ANSWER: C

KA: 056AA1.25

Ability to operate and/or monitor the main steam supply valve control switch as it applies to the loss of off-site power 2.9/2.9

10CFR55: 41.7

Reference: 4-EOP-ES-0.1, Step 3 RNO b.1.d

Cog Level: 1 Recall

Note that this is a LOOP situation because the reactor is tripped with the Startup Transformer OOS.

New Question

Response Analysis:

A. Incorrect because this action will not mitigate the rapid SG level transient in the 4B SG to prevent the impending reactor trip. Plausible because if the event had occurred at a lower power level, a manual runback to 45% would allow SG levels to stabilize without requiring a reactor trip.

B. Incorrect because this action will not mitigate the rapid SG level transient in the 4B SG to prevent the impending reactor trip. Plausible because each steam line's contribution to the total main steam flow is 33%. Reducing total steam flow by 40% might be expected to minimize the level transient in the other SGs.

C. Correct. A reactor trip is inescapable for this situation. A subsequent cooldown due to excessive steam flow is expected and this is terminated by isolating main steam.

D. Incorrect because placing the SDTC Mode switch to manual will not stop dumping steam. Plausible because the SDTC Mode switch will change the post trip operation of the SDTC system from Tavg control to steam header pressure control.

Q #13 057AK3.01

Unit 3 is at 50% power when power is lost to 120V Vital Instrument Panel 3P07.

- 3-ONOP-003.7 directs operators to place the Pressurizer Level Control Transfer Switch on VPA in Position 2 to eliminate the failed channel output.

Which ONE of the following describes why this action is taken?

If the Pressurizer Level Control Transfer Switch was in:

A. Position 1, the running Charging pump speed has gone to MINIMUM speed.

B. Position 1, Pressurizer heaters have gone to full output.

C. Position 3, Letdown has isolated.

D. Position 3, the running Charging pump speed has gone to MAXIMUM speed.

NOTE: 3-ONOP-003.7: "Loss of 120V Vital Instrument Panel 3P07"
VPA: Vertical Panel A

Q #13

ANSWER: C

KA: 057AK3.01

Knowledge of the reasons for the actions contained in EOP for loss of vital AC electrical instrument bus as they apply to the Loss of Vital AC Instrument Bus 4.1/4.4

10CFR55: 41.5, 41.10

Reference: 3-ONOP-003.7, Step 3 and NOTE prior to Step 3
*-BD-ONOP-003.7, Step 3.a
5610-T-D-15, Sheet 1

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because when in Position 1, the failed channel LT-460 (Channel 2) has no input into the Charging pump speed controllers. Plausible because a failure of one of the other Pressurizer level channels (LT-459) would have affected Charging pump speed.

B. Incorrect because this failure would have caused the Pressurizer heaters to turn off, not go to full output. Plausible because in Position 1, this failed channel does directly affect Pressurizer heaters.

C. Correct per the references. Letdown will isolate during this failure if the level control switch is in Position 3.

D. Incorrect because when in Position 1, the failed channel LT-460 (Channel 2) has no input into the Charging pump speed controllers. Plausible because a failure of one of the other Pressurizer level channels (LT-459) would have affected Charging pump speed.

Q #14 058AA1.01

Unit 3 is in Mode 1 and Unit 4 is in Mode 6.

- 4D MCC is out of service.
- Vital DC Bus 3D01 de-energizes.
- Following plant stabilization, the Shift Manager has given permission to re-energize 3D01.

Which ONE of the following describes how power will be restored to 3D01?

Strip the loads from 3D01, then place:

A. 3A2 Battery Charger in service, then place the 3A Battery in service.

B. 3A1 Battery Charger in service, then place the 3A Battery in service.

C. 3A Battery in service, then place 3A2 Battery Charger in service.

D. 3A Battery in service, then place 3A1 Battery Charger in service.

NOTE: MCC: Motor Control Center
DC: Direct Current

Q #14

ANSWER: D

KA: 058AA1.01

Ability to operate and/or monitor the crosstie of the affected DC Bus with the alternate supply as it applies to the Loss of DC Power 4.0/4.3

10CFR55: 41.7

Reference: 3-ONOP-003.4, Step 5.15 and NOTES prior to Step 5.15.4

Cog Level: 2 Comprehension

Level 2 because the operator has to recall that the #2 battery chargers are powered from the opposite unit "D" MCC. With "D" MCC OOS, the only battery charger option is the 3A1 charger. The operator then has to recall the correct procedural sequence for restoring power; battery first then the battery charger.

New Question

Response Analysis:

A. Incorrect because 3A2 Battery Charger has no power and the order is wrong. Plausible if the operator cannot recall the power supply to the 3A2 Battery Charger or the order of restoration.

B. Incorrect because the order of restoration is wrong. Plausible because the 3A1 battery charger is available for restoration.

C. Incorrect because 3A2 Battery Charger has no power. Plausible because the order of restoration is correct.

D. Correct per the references. Operators will restore the 3A Battery followed by 3A1 Battery Charger.

Q #15 062AK3.02

Unit 3 is at 100% power.

- Operators swap 3D 4KV Bus power supply to 3A 4KV Bus prior to taking 3A ICW pump out of service.

Which ONE of the following describes why 3D Bus is re-aligned to 3A Bus?

A. To restore the normal power supply alignment to the 3A ICW pump in preparation for its return to service.

B. To ensure that only 3B ICW pump would auto-start in the event of a LOOP.

C. To ensure that only 3C ICW pump would auto-start in the event of a SI actuation.

D. To ensure both 3B and 3C ICW pumps would auto-start on a LOOP coincident with SI actuation.

NOTE:

ICW:	Intake Cooling Water
LOOP:	Loss of Offsite Power
SI:	Safety Injection
KV:	Kilovolt

Q #15

ANSWER: D

KA: 062AK3.02

Knowledge of the reasons for the automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS as it applies to the Loss of Nuclear Service Water.
10CFR55: 41.4, 41.8

Reference: 3-OP-019 Step 6.1.2.2 and Basis, Attachment 2
SD-165, Pages 5 & 10
5613-T-L1, Sheet 12A

Cog Level: 2 Comprehension
Level 2 because the operator must know the power supplies to each of the ICW pumps and that the sequencer recognizes which ICW pump to start in the event of a LOOP/SI based on "D" bus alignment. He must also know that 2 ICW pumps are required to support SI loads and that until 3D Bus is realigned, only one ICW pump (3B) will auto start.

New Question

Response Analysis:

A. Incorrect because the 3A ICW pump is powered from the 3A 4kv Bus which is already powered. Re-aligning 3D Bust to 3A Bus is not required to restore 3A ICW pump to service. Plausible because if 3A ICW pump was powered from 3D Bus (as is 3C ICW pump) realignment would be performed for the reasons discussed above.

B. Incorrect because the reason for realigning 3D Bus to 3A Bus is to assure that two ICW pumps will start on a LOOP/SI actuation. Plausible because 3B ICW pump will receive a start signal in the event of a LOOP actuation.

C. Incorrect because the reason for realigning 3D Bus to 3A Bus is to assure that two ICW pumps will start on a LOOP/SI actuation. Plausible because 3C ICW pump will receive a start signal in the event of a SI actuation.

D. Correct per the references. The reason for realigning 3D Bus to 3A Bus is to assure that two ICW pumps will start on a LOOP/SI actuation.

Q #16 065AK3.04

Both Units are at 100% power.

- Instrument Air pressure begins to decrease on Unit 4.
- Instrument Air Compressors are running properly.
- The differential pressure across the Unit 4 Instrument Air Dryers is 12 psid and slowly increasing.

Which ONE of the following describes the correct operator response and the reason for the response?

A. Bypass the Unit 4 Instrument Air Dryers to restore Instrument Air from Unit 4 air compressors.

B. Open the cross-tie valves between the Unit 3 and Unit 4 Instrument Air systems to provide dry Instrument Air from Unit 3 to Unit 4.

C. Open the Service Air Supply to Unit 3/Unit 4 Tie valve to supply high-pressure Service Air to Unit 4.

D. Realign the Unit 4 Instrument Air Dryers to isolate the in-service Dryer Tower and place the standby Dryer Tower in service.

NOTE: psid: pounds per square inch differential

Q #16

ANSWER: B

KA: 065AK3.04

Knowledge of the reasons for the cross-over to backup air supplies as it applies to the Loss of Instrument Air 3.4/4.3

10CFR55: 41.5, 41.10

Reference: 0-ONOP-013, Steps 4, 9, 10
5614-M-3013 Sheets 1 and 2

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because 0-ONOP-013 directs the operator to cross-tie the Unit 3/Unit 4 IA systems. Plausible because bypassing the air dryers is directed if the opposite Unit's IA system is not available.

B. Correct per 0-ONOP-013. If the opposite unit's IA system is available, operators are directed to cross-tie the Unit 3/Unit 4 IA systems.

C. Incorrect because 0-ONOP-013 directs the operator to cross-tie the Unit 3/Unit 4 IA systems. Plausible because opening the Service Air cross-tie is directed if the loss of IA is due to compressor problems.

D. Incorrect because 0-ONOP-013 directs the operator to cross-tie the Unit 3/Unit 4 IA systems. Plausible because the air dryer package contains two separate and independent dryer towers that automatically swap when needed.

Q #17 077AA1.01

Unit 3 is at 5% power.

Unit 4 is at 40% power.

- Both units' Generator Hertz meters peg low below 58 hertz.

Which ONE of the following describes the effect on the plant if grid frequency drops to 56 hertz?

A. Only Unit 4 will trip due to RCP breaker-open logic.

B. Only Unit 3 will trip due to RCP breaker-open logic.

C. Both Unit 3 and Unit 4 will trip due to RCP breaker-open logic.

D. Neither Unit 3 nor Unit 4 will trip due to RCP breaker-open logic.

NOTE: RCP: Reactor Coolant Pump

Q #17

ANSWER: A

KA: 077AA1.01

Ability to operate and/or monitor grid frequency and voltage as they apply to Generator Voltage and Electric Grid Disturbances 3.6/3.7

10CFR55: 41.5, 41.10

Reference: 5610-T-L1 Sheet 2 & Sheet 20 & 30A

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that Unit 3 is below permissive P-7 (10%) and Unit 4 is between permissives P-7 and P-8 (45%). Then the operator must recall that low frequency will trip all RCPs at 56.1 hertz. Unit 4 will trip if 2 of 3 RCPs breakers trip open and Unit 3 will not trip regardless of how many breakers are open.

New Question

Response Analysis:

A. Correct per the references and discussion above. Only Unit 4 will trip due to Reactor Coolant Pump breaker-open logic.

B. Incorrect because only Unit 4 will trip. Plausible because Unit 3 RCP breakers will open but they will not cause a reactor trip at this power level. Also plausible because the operator is accustomed to Unit 3 tripping when RCPs' breakers open at higher power levels.

C. Incorrect because only Unit 4 will trip. Plausible because this is an event that affects both units' RCPs and if they were at the same power level, the effect would be the same for each.

D. Incorrect because only Unit 4 will trip. Plausible because this is an event that affects both units' RCPs and if they were at the same power level, the effect would be the same for each.

Q #18 W/E11EK2.1

3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation," Step 12, directs operators to "Verify No Backflow From RWST to Sump".

Which ONE of the following describes the valve configuration with the minimum number of open valves that would allow backflow from the RWST to the Containment Sump?

A. Both MOV-862A and MOV-862B are open while both MOV-860A and MOV-861A are open

B. Both MOV-862A and MOV-862B are open while both MOV-860A and MOV-860B are open

C. Either MOV-862A or MOV-862B is open while both MOV-860A and MOV-861A are open

D. Both MOV-862A and MOV-862B are open while either MOV-860A or MOV-860B is open

NOTE:

RWST:	Refueling Water Storage Tank
MOV-860A:	Contain. Recirc. Sump Isol. Valve
MOV-861A:	" " " " "
MOV-860B:	" " " " "
MOV-861B:	" " " " "
MOV-862A:	RHR Suction From RWST Valve
MOV-862B:	" " " " "

Q #18

ANSWER: A

KA: W/E11EK2.1

Knowledge of the interrelations between the Loss of Emergency Coolant Recirculation and components and functions of control and safety systems, including instrumentation , signals, interlocks, failure modes, and automatic and manual features 3.6/3.9

10CFR55: 41.7

Reference: 3-EOP-ECA-1.1: Step 12
5613-M-3050 Sheet 1

Cog Level: 2 Comprehension
Level 2 because the operator must evaluate the minimum valve configuration that will provide a flow path from the RWST to the Recirc Sumps. This also requires the operator to recall which valves are from the north recirc sump and which are from the south recirc sump and the fact that the 862 valves are in series with each other and the 860 valves are in series with the 861 valves.

Modified from NRC Exam - Group 21, 2004
PSA

Response Analysis:

A. Correct because this is the minimum configuration that will provide the flowpath necessary for water flow between the RWST and the Recirc sump.

B. Incorrect because 860A and 860B are in different headers. Opening both will not provide a flowpath between the RWST and the Recirc sump. Plausible because this configuration will open 3 of the 4 valves necessary to establish a path.

C. Incorrect because both MOV-862A and MOV-862B must be open to provide a flowpath. Plausible because 860A and 860B are in series. This configuration will open 3 of the 4 valves necessary to establish a path.

D. Incorrect because 860A and 860B are in different headers. Plausible because this configuration will open 3 of the 4 valves necessary to establish a path.

Q #19 001AK3.02

Unit 3 is at 80% power.

- Control rods are in AUTO.
- "D" Bank control rods are at 190 steps.
- A malfunction causes rods to withdraw at the maximum rate.
- Rods are placed in MANUAL and subsequently inserted to match Tavg with Tref.

Which ONE of the following describes the effect of this event on control rod operability and the applicable Tech Specs, if any?

A. Control Bank "D" control rods are inoperable because rods cannot be operated in AUTO.
Comply with the Action Statement(s) of Tech Spec 3.1.3.1

B. Control Bank "D" control rods are inoperable because rods cannot be operated in AUTO.
Comply with the Action Statement(s) of Tech Spec 3.0.3

C. All control rods are inoperable because of the uncontrolled control rod withdrawal event.
Comply with the Action Statement(s) of Tech Spec 3.1.3.1

D. All control rods are operable because there is no misaligned or stuck control rod.
Tech Spec 3.1.3.1 and Tech Spec 3.0.3 do NOT apply.

NOTE: Tech Specs Section 3.1.3.1: Movable Control Assemblies
Tech Specs Section 3.0.3: Applicability

Q #19

ANSWER: D

KA: 001AK3.02

Knowledge of the reasons for the following responses as they apply to the Continuous Rod Withdrawal: Tech Spec limits on rod operability. 3.2/4.3

10CFR55: 41.5, 41.10

Reference: 3-ONOP-028 CAUTION & NOTE prior to Step 4, Steps 4.4.1, 5.1.4, 5.1.6, NOTE prior to Step 5.1.10.3, Section 5.4
Tech Specs Section 1.17, 3.0.3, 3.1.3.1

Cog Level: 2 Comprehension

Level 2 because the operator must make the distinction between inoperability of the control rods vs inoperability of the rod control system. Tech Specs deal with the inoperability of control rods (i.e. stuck or misaligned rods). Tech Specs do not apply to inoperability of the control rod system. This event results in the control rod system being unable to operate in AUTO. All rods are still aligned and none are stuck. The Tech Spec does not apply.

New Question

Response Analysis

A. Incorrect because all control rods are operable. Plausible because if control rod inoperability existed, TS 3.1.3.1 would be the applicable Tech Spec.

B. Incorrect because all control rods are operable. Plausible because TS 3.0.3 would be applicable if control rods were inoperable and compliance with TS 3.1.3.1 could not be met.

C. Incorrect because all control rods are operable. Plausible because the rod withdrawal event led to the inoperability of the control rod system which would apply to all control banks that can normally be withdrawn in AUTO.

D. Correct per the references and discussion above.

Q #20 005AA1.01

Unit 3 Reactor power is 80%.

- "D" Bank Group 2 Control Rod H-8 is 20 steps lower than the rest of "D" bank.
- The Shift Manager has directed the crew to realign H-8.
- Annunciator B 9/4, ROD CONTROL URGENT FAILURE, alarms during the realignment.

Which ONE of the following describes which lift coil disconnect switches will be disconnected and the source of the B 9/4 alarm?

A. All "D" bank switches will be disconnected except H-8.
Group 1 is the source of the B 9/4 alarm.

B. Only H-8's switch will be disconnected.
Group 1 is the source of the B 9/4 alarm.

C. All "D" bank switches will be disconnected except H-8.
Group 2 is the source of the B 9/4 alarm.

D. Only H-8's switch will be disconnected.
Group 2 is the source of the B 9/4 alarm.

Q #20

ANSWER: A

KA: 005AA1.01

Ability to operate and/or monitor the CRDS as it applies to the inoperable / stuck control rod. 3.6/3.4

10CFR55: 41.7

Reference: 3-ONOP-028, Step 5.1.10, NOTE prior to Step 5.1.10.3

Cog Level: 1 Recall

Modified from Bank - 69022070211

Response Analysis:

A. Correct per the reference.

B. Incorrect because H-8 is the only disconnect switch that will not be disconnected. Plausible because Group 1 is the source of the B 9/4 alarm.

C. Incorrect because Group 1 is the source of the B 9/4 alarm. Plausible because all "D" Bank switches will be disconnected except H-8.

D. Incorrect because H-8 is the only disconnect switch that will not be disconnected and because Group 1 is the source of the B 9/4 alarm. Plausible if the operator does not recall the correct switch alignment or that the source of the alarm is the group with all lift coil switches disconnected.

Q #21 024AA2.01

The Unit 4 RO is Emergency Borating.

- MOV-4-350 is placed to OPEN.
- Both red and green lights for MOV-4-350 are out.
- FI-4-110 displays 20 gpm flow.

Which ONE of the following describes the correct operator response?

A. Verify CV-4-310A is open and then open CV-4-310B.

B. Hold closed LCV-4-115C. Locally open breaker 40669.
When 40669 is open, release LCV-4-115C control switch.

C. Open FCV-4-113A OR FCV-4-113B. Locally open 4-356.
When 4-356 is open, close FCV-4-113B if opened.

D. Open FCV-4-113A AND FCV-4-113B. Locally open 4-356.
When 4-356 is open, close FCV-4-113B.

NOTE:

RO:	Reactor Operator
MOV-4-350:	Emergency Boration valve
FI-4-110:	Emergency Borate Flow indicator
LCV-4-115C	VCT Outlet Isolation valve
FCV-4-113A	Boric Acid to Blender valve
FCV-4-113B	Blender Flow to Charging Pump valve
CV-4-310A	Loop A Charging Isolation valve
CV-4-310B	Loop C Charging Isolation valve
4-356	Manual Emergency Boration valve
40669	LCV-4-115C breaker
gpm:	gallons per minute

Q #21

ANSWER: D

KA: 024AA2.01

Ability to determine and interpret whether boron flow and/or MOVs are malfunctioning from plant conditions as it applies to Emergency Boration. 3.8/4.1

10CFR55: 43.5

Reference: 4-ONOP-046.1, Step 1.d
5614-E-25, Sheet 27C

Cog Level: 2 Comprehension
Level 2 because the operator must recognize that the loss of lights on MOV-350 and the lower than expected flowrate on FI-110 imply MOV-350 has failed to fully open. The operator must also know that the 20 gpm indicated is not adequate (60 gpm required) and additional actions are needed. The operator must then recall the additional actions to perform.

Modified from Exam Bank Question 69022320106
PSA

Response Analysis:

A. Incorrect because while opening CV-310A and CV-310B may increase charging flow to the RCS, this action will not increase the degraded boric acid flow. Plausible because the manipulation of these two valves is discussed in the same step of the emergency boration initiation procedure.

B. Incorrect because this is the prescribed action taken for the failure of boric acid pumps, not MOV-350. Plausible because these same step actions will introduce boric acid flow but it will be from the lower concentration RWST.

C. Incorrect because the manipulations described will not produce flow. Plausible because these are the same actions as described in the correct answer except both FCV-113A and FCV-113B must be opened to achieve flow.

D. Correct per 4-ONOP-046.1, Step 1.d. These actions will produce adequate emergency boration flow.

Q #22 036AK3.02

The Unit 3 SFP Bridge Crane operator is moving a fuel element from a Region 1 fuel rack through the keyway.

- An alarm sounds and a red light flashes on the south wall of the Spent Fuel Pit.

Which ONE of the following describes the cause of these alarms and the correct operator response?

The Bridge Crane is too close to the:

A. New Fuel Elevator.
Lower the New Fuel Elevator to the full DOWN position.

B. New Fuel Elevator.
Raise the New Fuel Elevator to the full UP position.

C. New Fuel Monorail Hoist.
Move the New Fuel Monorail Hoist to the EAST end of its track.

D. New Fuel Monorail Hoist.
Move the New Fuel Monorail Hoist to the WEST end of its track.

NOTE: SFP: Spent Fuel Pit

Q #22

ANSWER: C

KA: 036AK3.02

Knowledge for the reasons for Interlocks associated with fuel handling equipment as they apply to the Fuel Handling Incidents 2.9/3.6

10CFR55: 41.5, 41.10

Reference: 3-OP-038.5 Steps 4.4 and 4.5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the alarm sounds because the bridge crane is too close to the new fuel monorail hoist, not the new fuel elevator. Plausible because the bridge crane is also very near the new fuel elevator at the described position

B. Incorrect because the alarm sounds because the bridge crane is too close to the new fuel monorail hoist, not the new fuel elevator. Plausible because the bridge crane is also very near the new fuel elevator at the described position

C. Correct per the reference. The bridge crane is too close to the new fuel monorail hoist and operators should move the new fuel monorail hoist to the EAST end of its track.

D. Incorrect because operators should move the new fuel monorail hoist to the EAST end of its track. Plausible because the alarm sounds because the bridge crane is too close to the new fuel monorail hoist

Q #23 059AK1.02

Unit 4 is at 100% power.

- A Steam Generator Tube Rupture occurs on the 4B Steam Generator.
- Unit 4 fuel clad defects and Iodine concentrations are at the levels assumed in the FSAR.

The FSAR assumes operators will terminate the tube rupture _____ and the Iodine dose will be _____ the 10CFR100 limits.

A. in 30 minutes
less than

B. in 30 minutes
greater than

C. in 60 minutes
less than

D. in 60 minutes
greater than

NOTE: FSAR: Final Safety Analysis Report
10CFR100: Code of Federal Regulations
Reactor Site Criteria

Q #23

ANSWER: A

KA: 059AK1.02

Knowledge of the operational implications of the biological effects on humans of various types of radiation, exposure levels that are acceptable for nuclear power plant personnel, and the units used for radiation-intensity measurements and for radiation exposure levels as they apply to Accidental Liquid Radwaste Release 2.6/3.2
10CFR55: 41.8, 41.10

Reference: FSAR Page 14.2.4-4, 10CFR100.11(a)(1)
0-EPIP-20126 Step 4.5, Enclosure 1 Page 2 of 3

Cog Level: 2 Comprehension
Level 2 because the operator will have to realize that the iodine that will be released will contribute to the thyroid dose which is listed in 10CFR100 as CDE (expected dose < 1.0 rem, limit 300 rem). The operator will also have to recall the time required to terminate the tube rupture assumed in the FSAR.

New Question

Response Analysis:

A. Correct per the references. The FSAR assumes operators will terminate the tube rupture within 30 minutes and the thyroid dose will be less than 10CFR100 limits.

B. Incorrect because the thyroid dose will be less than 10CFR100 limits for occupational workers. Plausible because the FSAR assumes operators will terminate the tube rupture within 30 minutes and because the FSAR assumes extremely high values for failed fuel, pre-existing tube leakage, pre-existing iodine levels in the RCS and iodine spike during the event.

C. Incorrect because the FSAR assumes operators will terminate the tube rupture within 30 minutes. Plausible because 60 minutes is a reasonable time frame to accomplish the actions required to terminate the tube rupture and because the thyroid dose will be less than 10CFR100 limits.

D. Incorrect because the FSAR assumes operators will terminate the tube rupture within 30 minutes and the thyroid dose will be less than 10CFR100 limits. Plausible because 60 minutes is a reasonable time frame to accomplish the actions required to terminate the tube rupture and because the FSAR assumes extremely high values for failed fuel, pre-existing tube leakage, pre-existing iodine levels in the RCS and iodine spike during the event.

Q #24 067AG2.4.49

A plant operator reports that the Unit 3 Emergency Diesel Oil Storage tank has ruptured and caught fire.

Which ONE of the following describes the correct order of Immediate Operator Actions for the Unit 3 Reactor Operator?

A. Announce the Class "A" fire using the plant page.
Sound the fire alarm.
Repeat the page announcement.

B. Announce the Class "B" fire using the plant page.
Sound the fire alarm.
Repeat the page announcement.

C. Sound the fire alarm.
Announce the Class "A" fire using the plant page.
Repeat the page announcement.

D. Sound the fire alarm.
Announce the Class "B" fire using the plant page.
Repeat the page announcement.

Q #24

ANSWER: B

KA: 067AG2.4.49

As it relates to the plant fire on site: Ability to perform without reference to procedures those actions that require immediate operation of system components and controls 4.6/4.4

10CFR55: 41.10, 43.2

Reference: 0-ONOP-016.10, Step 4.1
0-EPIP-20101, NOTE prior to Step 5.3.1.3

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that if the EDG Oil Storage Tank has ruptured and caught fire, the type of fire has to be a Class B; Combustible liquids. Then the operator must recall the order of actions required by 0-ONOP-016.10.

New Question

Response Analysis:

A. Incorrect because this is a Class B fire. Plausible because the order given is correct.

B. Correct per the references. This oil fire is a Class B fire and the correct order is Announce / Sound Fire Alarm / Announce.

C. Incorrect because this is a Class B fire and the order is incorrect. Plausible because all three of the components of the required actions are presented.

D. Incorrect because the order is incorrect. Plausible because this is a Class B fire.

Q #25 W/E08EA1.3

Operators have entered 4-EOP-FR-P.1, "Response to Imminent Pressurized Thermal Shock Condition".

- The RO is using the Standby Feedwater system to provide feed flow to the Steam Generators.

Which ONE of the following identifies the plant parameter the RO will use to control feed water flow?

The RO will use changes in:

A. Steam flow.

B. Steam Generator pressure.

C. RCS pressure.

D. RCS temperature.

NOTE: RO: Reactor Operator
RCS: Reactor Coolant System

Q #25

ANSWER: D

KA: W/E08EA1.3

Ability to operate and/or monitor the desired operating results during abnormal and emergency situations as they apply to Pressurized thermal shock. 3.6/4.0

10CFR55: 41.7

Reference: 4-EOP-FR-P.1 CAUTION prior to Step 2

Cog Level: 1 Recall

Modified from Exam Bank - 69023360102

PSA

Response Analysis:

A. Incorrect because steam flow is not the parameter directed by FR-P.1. Plausible because feed flow rate is normally matched with steam flow rate to maintain a constant water inventory in the SGs.

B. Incorrect because steam generator pressure is not the parameter directed by FR-P.1. Plausible because SG pressure is a function of SG temperature which will be affected by SG flow rate.

C. Incorrect because RCS pressure is not the parameter directed by FR-P.1. Plausible because RCS pressure would be expected to change as a result of changes in pressurizer level as a result of changes in the feed flow rate.

D. Correct because RCS temperature is a plant parameter identified in the CAUTION in FR-P.1.

Q #26 W/E09EK1.3

Operators are performing a natural circulation cooldown on Unit 3.

- Auxiliary spray is being used to depressurize the RCS.
- As pressure is decreased through 900 psig, Pressurizer level rapidly increases.
- Charging and letdown are in manual and are matched.

Which ONE of the following describes the correct operator response?

A. Increase the cooldown rate to the maximum allowed rate of 25°F/hour.
Continue performing 3-EOP-ES-0.2.

B. Increase the cooldown rate to the maximum allowed rate of 100°F/hour.
Transition to 3-EOP-ES-0.3.

C. Repressurize the RCS to collapse any steam voids.
Continue performing 3-EOP-ES-0.2.

D. Repressurize the RCS to collapse any steam voids.
Transition to 3-EOP-ES-0.3.

NOTE:

3-EOP-ES-0.2:	"Natural Circulation Cooldown"
3-EOP-ES-0.3:	"Natural Circulation Cooldown with Steam Void in Vessel"
RCS:	Reactor Coolant System
psig:	pounds per square inch gauge
°F:	degrees Fahrenheit

Q #26

ANSWER: C

KA: W/E09EK1.3

Knowledge of the operational implications of the Annunciators and conditions indicating signals, and remedial actions associated with Natural Circulation Operations 3.3/3.6

10CFR55: 41.8, 41.10

Reference: 3-EOP-ES-0.2, Step 19

Cog Level: 1 Recall

Direct from Exam Bank - 69023240308

Response Analysis:

A. Incorrect because increasing the cooldown rate will not immediately help to correct the steam void in the RCS. Plausible because 25°F/hr is the maximum allowed cooldown rate in ES-0.2 and if the void is successfully collapsed, operators can stay in ES-0.2.

B. Incorrect because increasing the cooldown rate will not immediately help to correct the steam void in the RCS. Also 100°F/hour is the maximum allowed cooldown rate in ES-0.3. Plausible because if the void cannot be collapsed, it would be correct to transition to ES-0.3

C. Correct per the reference. Operators should repressurize the RCS and continue in ES-0.2.

D. Incorrect because transition to ES-0.3 is not necessary. Plausible because repressurizing the RCS is the correct action in accordance with Step 19 of ES-0.2.

Q #27 W/E14EK2.1

Operators are performing 4-EOP-FR-Z.1, "Response to High Containment Pressure."

- Step 4.b directs the Reactor Operator to "Verify Control Room ventilation status panel – PROPER EMERGENCY RECIRCULATION ALIGNMENT."

Which ONE of the following describes the correct Control Room Ventilation system status when the operator completes this step?

A.
Control Room Recirc Dampers D-11A and D-11B: OPEN
Ventilation Inlet Dampers D-1A and D-1B: OPEN
East and West Inlet Dampers D-2 and D-3: CLOSE

B.
Control Room Recirc Dampers D-11A and D-11B: CLOSE
Ventilation Inlet Dampers D-1A and D-1B: CLOSE
East and West Inlet Dampers D-2 and D-3: CLOSE

C.
Control Room Recirc Dampers D-11A and D-11B: CLOSE
Ventilation Inlet Dampers D-1A and D-1B: OPEN
East and West Inlet Dampers D-2 and D-3: OPEN

D.
Control Room Recirc Dampers D-11A and D-11B: OPEN
Ventilation Inlet Dampers D-1A and D-1B: CLOSE
East and West Inlet Dampers D-2 and D-3: OPEN

Q #27

ANSWER: D

KA: W/E14EK2.1

Knowledge of the interrelations between the High Containment Pressure and Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features. 3.4/3.7

10CFR55: 41.7

Reference: 4-EOP-FR-Z.1 Step 4.b 0-OP-025 Section 7.2.2

Cog Level: 1 Recall

Direct from Bank: 69021550622

Response Analysis:

A. Incorrect because Ventilation Inlet Dampers will be closed and East and West Inlet Dampers will be open. Plausible because Control Room Recirc Dampers will be open.

B. Incorrect because Control Room Recirc Dampers will be open and East and West Inlet Dampers will be open. Plausible because Ventilation Inlet Dampers will be closed

C. Incorrect because Control Room Recirc Dampers will be open and Ventilation Inlet Dampers will be closed. Plausible because and East and West Inlet Dampers will be open.

D. Correct per the references. Control Room Recirc Dampers will be open. Ventilation Inlet Dampers will be closed. East and West Inlet Dampers will be open.

Q #28 003K1.13

Which ONE of the following describes the function of the RCP Oil Lift pump and its relationship to RCP start?

The RCP Oil Lift pump prevents metal to metal contact for the RCP:

A. radial bearings during RCP startup.
The Oil Lift pump must be running before the RCP can be started.

B. thrust bearing during RCP startup.
The Oil Lift pump must be running before the RCP can be started.

C. thrust bearing during RCP startup.
If warm, the RCP does not need the Oil Lift pump to be running before start.

D. radial bearings during RCP startup.
If warm, the RCP does not need the Oil Lift pump to be running before start.

NOTE: RCP: Reactor Coolant Pump

Q #28

ANSWER: B

KA: 003K1.13

Knowledge of the physical connections and/or cause-effect relationships between the RCPS and RCP bearing lift oil pump. 2.5/2.5

10CFR55: 41.2 to 41.9

Reference: SD-008 Page 18
BD-OP-041.1 Step 13
5610-T-L1 Sheet 30A

Cog Level: 1 Recall

Modified from Exam Bank - 69021080623

Response Analysis:

A. Incorrect because the RCP Oil Lift pump prevents metal to metal contact for the RCP thrust bearing not the radial bearings. Plausible because the radial bearings are also oil lubricated and the Oil Lift pump must be running before the RCP can be started.

B. Correct per the references. The RCP Oil Lift pump prevents metal to metal contact for the RCP thrust bearing during RCP startup and the Oil Lift pump must be running before the RCP can be started.

C. Incorrect because the Oil Lift pump must be running before the RCP can be started. Plausible because the RCP Oil Lift pump prevents metal to metal contact for the RCP thrust bearing during RCP startup.

D. Incorrect because the RCP Oil Lift pump prevents metal to metal contact for the RCP thrust bearing during RCP startup and the Oil Lift pump must be running before the RCP can be started. Plausible because the radial bearings are also oil lubricated and no interlock exists to prevent RCP start based on radial bearing lubrication.

Q #29 003K6.04

Unit 3 is at 100% power when SI actuates.

Which ONE of the following describes the effect of this SI actuation on the RCPs?

A. Seal injection flow to the RCPs will be isolated.

B. CCW flow to and from the RCPs motor bearing coolers will be isolated.

C. CCW flow to and from the RCPs thermal barrier will be isolated.

D. #1 seal backpressure will increase causing a decrease in #1 seal leak-off flow.

NOTE: RCPs: Reactor Coolant Pumps
SI: Safety Injection
CCW: Component Cooling Water

Q #29

ANSWER: D

KA: 003K6.04

Knowledge of effect of a loss or malfunction on Containment isolation valves affecting RCP operation will have on the RCPS. 2.8/3.1

10CFR55: 41.7

Reference: 5613-M-3047 Sheet 3

Cog Level: 2 Comprehension

Level 2 because the operator must recall that SI actuation causes Phase "A" containment isolation. Phase "A" closes the #1 seal return valves MOV-381 and MOV-6386, temporarily terminating #1 seal return flow. Pressure in the seal return line rises to the setpoint of the seal return relief valve, RV-382 (setpoint 150 psig). #1 seal leakoff recommences (this time to the PRT). The net effect is an increase in the backpressure in the #1 Seal return line, causing a reduction in #1 seal leakoff flow.

Modified from Bank - 69021080601

Response Analysis:

A. Incorrect because seal injection is not isolated by SI actuation or Phase A actuation. Plausible because most non-safety related process streams are isolated as a result of Phase A actuation.

B. Incorrect because CCW to and from the RCPs is not isolated as a result of SI or Phase A actuation. Plausible because CCW to and from the RCPs is isolated as a result of Phase B actuation which sometimes accompanies SI and Phase A actuation.

C. Incorrect because CCW to and from the RCPs is not isolated as a result of SI or Phase A actuation. Plausible because CCW to and from the RCPs is isolated as a result of Phase B actuation which sometimes accompanies SI and Phase A actuation.

D. Correct per the discussion above.

Q #30 004A2.13

Unit 4 operators are performing 4-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation".

Unit 4 RWST level is at 30,000 gallons and decreasing.

Which ONE of the following describes the effect of this level on Unit 4 Charging Pump operation and the correct operator response to this RWST level?

The running Charging Pump is:

A. in immediate danger of gas binding.
Stop the running Charging Pump.

B. still capable of delivering flow.
Add makeup to the Unit 4 RWST.

C. still capable of delivering flow.
Isolate the Charging flowpath and maintain Seal Injection flow.

D. still capable of delivering flow.
Isolate the Seal Injection flowpath and maintain Charging flow.

NOTE: RWST: Refueling Water Storage Tank

Q #30

ANSWER: B

KA: 004A2.13

Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Low RWST. 3.6/3.9

10CFR55: 41.5, 43.5

Reference: 4-EOP-ECA-1.1, Step 38, 41, 42
BD-EOP-ECA-1.1, Step 42

Cog Level: 1 Recall

New Question

PSA

Response Analysis:

A. Incorrect because gas binding is not an immediate danger until RWST level drops to 20,000 gallons. Plausible because if gas binding was imminent, stopping the running charging pump would be correct.

B. Correct per the references. Operators are making up to the RWST and gas binding is still not imminent.

C. Incorrect because ECA-1.1, Step 38 has operators establish both charging and seal injection flow. Plausible because at this low RWST level, isolating the charging flow path will extend the RWST inventory.

D. Incorrect because ECA-1.1, Step 38 has operators establish both charging and seal injection flow. Plausible because at this low RWST level, isolating the seal injection flow path will extend the RWST inventory.

Q #31 005K6.03

Operators are performing 3-EOP-ES-1.3, "Transfer to Cold Leg Recirculation."

- MOV-3-749A is successfully opened.
- MOV-3-749B can NOT be opened.

Which ONE of the following describes the effect of the MOV-3-749B failure on the RHR system?

The RHR system:

A. still has adequate decay heat removal capability.

B. will NOT have adequate decay heat removal capability.

C. will have adequate decay heat removal capability ONLY IF Steam Generator steam dump heat removal supplements the RHR system heat removal.

D. will have adequate decay heat removal capability ONLY IF all three Component Cooling Water heat exchangers are in service.

NOTE:

RHR:	Residual Heat Removal
MOV-3-749A:	RHR Heat Exchanger "A" CCW Outlet Valve
MOV-3-749B:	RHR Heat Exchanger "B" CCW Outlet Valve

Q #31

ANSWER: A

KA: 005K6.03

Knowledge of the effect of a loss or malfunction on the RHR Heat Exchanger will have on the RHRS. 2.5/2.6

10CFR55: 41.7

Reference: 3-EOP-ES-1.3 Step 14.e
0-ADM-536 Page 80
SD-021 Page 11
SD-040 Page 7

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. The RHR system is designed to accommodate a single failure and still perform its intended safety function.

B. Incorrect because the RHR system is designed to accommodate a single failure and still perform its intended safety function. Plausible because the failure of MOV-749B has resulted in a 50% loss of cooling capability.

C. Incorrect because the RHR system is designed to accommodate a single failure and still perform its intended safety function. Plausible because SG heat removal is available and plays a significant role in heat removal during some LOCAs.

D. Incorrect because the RHR system is designed to accommodate a single failure and still perform its intended safety function. Plausible because RHR heat removal is dependent upon CCW heat removal.

Q #32 006A2.06

Which ONE of the following describes:

(1) a consequence of Nitrogen intrusion into the ECCS and

(2) the method used to prevent that consequence?

A. (1) Absorption into the ECCS water affecting water chemistry
(2) Sampling for nitrogen concentration in the ECCS

B. (1) Absorption into the ECCS water affecting water chemistry
(2) Periodically venting ECCS piping and equipment

C. (1) Water hammer causing damage to ECCS equipment
(2) Periodically venting ECCS piping and equipment

D. (1) Water hammer causing damage to ECCS equipment
(2) Sampling for nitrogen concentration in the ECCS

NOTE: ECCS: Emergency Core Cooling System

Q #32

ANSWER: C

KA: 006A2.06

Ability to (a) predict the impacts of the following malfunctions or operations on the ECCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Water Hammer. 3.3/3.5

10CFR55: 41.5

Reference: RHR System Design Basis Document Step 3.5.4 & 7.4.22
SI System Design Basis Document Step 7.4.12
Lesson Plan 6902602 SHO 6910602 Page 9 & 19
NRC Info Notice 91-50 Page 2 & 4 of 5
3-OSP202.2, Section 1.0

Cog Level: 1 Recall

New Question

Response Analysis

A. Incorrect because the proven consequence (refer to industry events listed) is the potential for water hammer and the ECCS is not sampled normally for Nitrogen. Plausible because Nitrogen absorption into water is a common occurrence (ex. Accumulators).

B. Incorrect because the proven consequence is the potential for water hammer. Plausible because ECCS equipment is periodically vented.

C. Correct per the references. Water hammer events have occurred at multiple PWRs.

D. Incorrect because the ECCS is not sampled normally for Nitrogen. Plausible because the proven consequence is the potential for water hammer

Q #33 007A4.09

Unit 3 is at 100% power when Pressurizer Safety, RV-3-551B, begins to leak.

Which ONE of the following describes how operators will quantify and verify the rate of leakage from RV-3-551B?

Operators will:

A. perform a Pressurizer Relief Tank level change calculation and monitor the change in level in the Volume Control Tank.

B. perform a Reactor Coolant System leakrate calculation and monitor the change in level in the Pressurizer Relief Tank.

C. compare the rate of drop in Pressurizer level to the rate of rise in the Pressurizer Relief Tank level.

D. compare the rate of rise in charging flow rate to the rate of drop in Pressurizer level.

Q #33

ANSWER: B

KA: 007A4.09

Ability to manually operate and/or monitor in the control room relationships between PZR level and changing levels of the PRT. 2.5/2.7

10CFR55: 41.7

Reference: 3-ONOP-041.5, Steps 15 & 16

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the operators will perform an RCS leakrate calculation, not a PRT level change calculation. Plausible because operators will monitor the lowering of VCT level.

B. Correct per the reference. Operators will perform an RCS leakrate calculation (ONOP-041.5, Step 16) and will monitor PRT level change (ONOP-041.5, Step 15).

C. Incorrect because Pressurizer level will not drop due to an increase in Charging pump speed. Plausible because there will be a rate of rise in PRT level that will be dependent upon the rate of leakage.

D. Incorrect because Pressurizer level will not drop. Plausible because charging flow rate will rise.

Q #34 008A4.03

Unit 3 is at 100% power.

- Operators are performing 3-OSP-030.1, "Component Cooling Water Pump Inservice Test."
- The CCW system is being realigned to obtain 6500 gpm flow on the 3A CCW header for the 3A CCW Pump in-service test.

Which ONE of the following describes the correct actions operators will take to obtain 6500 gpm on FI-3-613A?

A. Realign Train "B" safeguards equipment to the 3A CCW header.
Split the CCW headers between the 3A and 3B CCW pumps.
Start 3A ECC and manually throttle open MOV-3-749A.

B. Realign non-safeguards equipment to the 3A CCW header.
Split the CCW headers between the 3B and 3C CCW pumps.
Start 3A ECC and manually throttle open MOV-3-749A.

C. Realign non-safeguards equipment to the 3A CCW header.
Split the CCW headers between the 3A and 3B CCW pumps.
Start 3A ECC and manually throttle open MOV-3-749A.

D. Realign non-safeguards equipment to the 3A CCW header.
Split the CCW headers between the 3A and 3B CCW pumps.
Start 3A ECC and 3C ECC.

NOTE:

CCW:	Component Cooling Water
FI-3-613A:	3A CCW Header Flow Indicator
ECC:	Emergency Containment Cooler
MOV-3-749A:	3A RHR HX Comp Cooling Outlet MOV

Q #34

ANSWER: C

KA: 008A4.03

Ability to manually operate and/or monitor in the control room: throttling of the CCW pump discharge valve. 2.7/2.5
10CFR55: 41.7

Reference: 3-OSP-030.1 Steps 7.1.2 through 7.1.15

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the operators should realign non-safeguards equipment to the 3A CCW header, not the Train "B" safeguards equipment. Plausible because the Train "B" safeguards equipment is on the 3B CCW header and could be shifted. Also plausible because operators will split the CCW headers between the 3A and 3B CCW pumps and will start the 3A ECC and manually throttle open MOV-749A.

B. Incorrect because operators will split the CCW headers between the 3A and 3B CCW pumps. Plausible because the operators should realign non-safeguards equipment to the 3A CCW header and will start the 3A ECC and manually throttle open MOV-749A.

C. Correct per the reference and discussion above. To obtain 6500 gpm on FI-613A, operators will realign non-safeguards equipment to the 3A CCW header. Split the CCW headers between the 3A and 3B CCW pumps. Start 3A ECC and manually throttle open MOV-3-749A.

D. Incorrect because operators will start the 3A ECC and manually throttle open MOV-749A, not start the 3A and 3C ECC. Plausible because operators will operators will realign non-safeguards equipment to the 3A CCW header and split the CCW headers between the 3A and 3B CCW pumps and start the 3A ECC.

Q #35 008K3.01

Unit 4 is at 100% power.

- Operators start a second Component Cooling Water pump.
- A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW, alarms
- A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW, alarms
- Annunciator A1/1 immediately clears.
- Annunciator A 1/3 remains locked in.

Which ONE of the following describes the cause of these alarms, the effect on RCP operation, and the correct operator response?

A. MOV-4-626 has closed.
RCPs may continue running.
Re-open MOV-4-626.

B. MOV-4-6386 has closed.
RCPs may continue running.
Re-open MOV-4-6386.

C. MOV-4-626 has closed.
RCPs must be stopped immediately.
Trip the reactor and enter 3-EOP-E-0.

D. MOV-4-6386 has closed.
RCPs must be stopped immediately.
Trip the reactor and enter 3-EOP-E-0.

NOTE:	RCP:	Reactor Coolant Pump
	MOV-4-626:	RCP Seal Cooling Water Outlet Valve
	MOV-4-6386:	Excess Letdown and RCP Seal Return Valve
	3-EOP-E-0:	"Reactor Trip or Safety injection"

Q #35

ANSWER: A

KA: 008K3.01

Knowledge of the effect that a loss or malfunction of the CCWS will have on the loads cooled by the CCWS. 3.4/3.5
10CFR55: 41.7

Reference: 4-ONOP-041.1, Steps 28 and 33.
4-ARP-097.CR A1/1 and A1/3
SD-008, Page 22

Cog Level: 2 Comprehension
Level 2 because the operator must evaluate the situation and alarms presented and conclude that the event that has occurred can only be an inadvertent closure of MOV-626 when the CCW pump start increased CCW flow. The operator must then recall that operation without CCW to the thermal barriers is permitted as long as seal injection is maintained within normal limits. Finally the operator must recall the procedural guidance that allows re-opening of MOV-626 under these conditions.

New Question

Response Analysis:

A. Correct per the references and discussion above.

B. Incorrect the situation presented can only be caused by closure of MOV-4-626. Plausible because the water in the area of the thermal barrier is actually being cooled by seal injection flow down past the thermal barrier and because re-opening MOV-6386 when it closed due to spurious actuation would be acceptable.

C. Incorrect because RCPs do not have to be stopped immediately and the reactor does not have to be tripped. Plausible because the event is an MOV-626 closure.

D. Incorrect because the event is an MOV-626 closure and the RCPs do not have to be stopped immediately and the reactor does not have to be tripped. Plausible because a complete loss of thermal barrier cooling would quickly damage the RCPs and force a reactor trip (when #1 seal leakoff temp got too high) and stopping the RCPs.

Q #36 010K1.02

Operators are performing a shutdown of Unit 4 in accordance with 4-GOP-305, "Hot Standby to Cold Shutdown".

- Operators have blocked the High Steam Flow SI signal.
- Operators are preparing to block SI again.

Which ONE of the following describes the SI signal being blocked, the block permissive, and the effect on automatic operations?

A. Low Pressurizer Pressure SI
Pressurizer pressure less than 2000 psig.
Automatic opening of Pressurizer PORVs is blocked

B. High Steamline ΔP SI
Pressurizer pressure less than 2000 psig.
Automatic opening of Pressurizer Spray valves is blocked.

C. Low Pressurizer Pressure SI
RCS Tavg less than 543°F.
Automatic opening of Pressurizer Spray valves is blocked.

D. High Steamline ΔP SI
RCS Tavg less than 543°F.
Automatic opening of Pressurizer PORVs is blocked.

NOTE:

SI:	Safety Injection
ΔP:	differential pressure
PORVs:	Power Operated Relief Valves
psig:	pounds per square inch gauge
°F:	degrees Fahrenheit

Q #36

ANSWER: A

KA: 010K1.02

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the ESFAS 3.9/4.1

10CFR55: 41.2 to 41.9

Reference: 4-GOP-305, Step 4.8.1, 5.4 & 5.5
5610-TD-16A, Sheet 1

Cog Level: 2 Comprehension
Level 2 because the operator must recall that the second SI block is dependent upon the 2000 psig permissive. The first SI block was dependent upon the 543°F permissive. This second SI block blocks Low Pressurizer Pressure SI and blocks High Steamline ΔP SI. The same signal (Pressurizer pressure <2000 psig) also sends a block signal to the Pressurizer PORVs, blocking automatic opening below 2000 psig.

New Question

Response Analysis:

A. Correct per the reference. The permissive to block Low Pressurizer Pressure SI is Pressurizer pressure less than 2000 psig and it also blocks the automatic opening of Pressurizer PORVs.

B. Incorrect because the automatic opening of the Pressurizer spray valves is not blocked. Plausible because the permissive to block High Steamline ΔP SI is Pressurizer pressure less than 2000 psig.

C. Incorrect because the permissive to block Low Pressurizer Pressure SI is Pressurizer pressure less than 2000 psig, not 543°F and because the automatic opening of the Pressurizer spray valves is not blocked. Plausible because Low Pressurizer Pressure SI is one of the SI signals that gets blocked the second time and 543°F is a block signal.

D. Incorrect because the permissive to block High Steamline ΔP SI is Pressurizer pressure less than 2000 psig, not 543°F. Plausible because High Steamline ΔP is one of the SI signals that gets blocked the second time and 543°F is a block signal and it is the opening of the PORVs that gets blocked.

Q #37 010K 5.01

Operators are responding to a Main Steam Line Break on Unit 4.

- During the event the Pressurizer completely emptied.
- Safety Injection and Charging flow have restored Pressurizer level to 50%.
- Pressurizer steam space temperature is 600°F.
- Pressurizer water space temperature is 560°F.
- Pressurizer pressure is 2100 psig.
    - Operators are preparing to restore normal letdown.

Which ONE of the following identifies the lowest value RCS pressure may reach when letdown is established?

A. 1118 psig

B. 1133 psig

C. 1528 psig

D. 1543 psig

NOTE: Steam Tables Provided

NOTE: RCS: Reactor Coolant System
psig: pounds per square inch gauge

Q #37

ANSWER: A

KA: 010K 5.01

Knowledge of the operational implications of the determination of condition of fluid in PZR, using steam tables as it applies to the PZR PCS. 3.5/4.0

10CFR55: 41.5

Reference: 4-EOP-E-1 Steps 3, 10 4-EOP-ES-1.1 Steps 4, 9 Steam Tables

Cog Level: 3 Analysis

Level 2 because the operator must recall that SI has been terminated and Charging flow reduced in ES-1.1. The Pressurizer is not saturated and Pressurizer heaters are adding sensible heat. When letdown is cut in, Pressurizer and RCS pressure can go as low as the saturation pressure associated with Pressurizer water space temperature. The operator must use the steam table to determine the saturation pressure associated with 560°F (1133 psia). The operator must then convert 1133 psia to psig (1118 psig).

New Question

NOTE: Provide Steam Tables to operators.

Response Analysis:

A. Correct per the references and discussion above. RCS pressure could drop as low as 1118 psig.

B. Incorrect because RCS pressure could drop as low as 1118 psig. Plausible if the operator fails to convert psia to psig.

C. Incorrect because RCS pressure could drop as low as 1118 psig. Plausible if the operator assumes Pressurizer steam space temperature is the controlling parameter in this situation.

D. Incorrect because RCS pressure could drop as low as 1118 psig. Plausible if the operator assumes Pressurizer steam space temperature is the controlling parameter in this situation and fails to convert psia to psig.

Q #38 012A3.04

Unit 3 is at 80% power.

Operators are performing 3-ONOP-003.6, "Loss of 120V Vital Instrument Panel 3P06."

- 3A SG level is 63% narrow range and stable.
- Power has NOT been restored to 3P06.
- The RO adjusts feed flow in the correct direction to restore normal level in the 3A SG.

Related to the loss of 3P06, which ONE of the following describes a possible consequence of the RO's actions?

A. Turbine trip actuation may occur due to 3A SG high level logic actuation.

B. Reactor trip breakers may open due to SG Low Level with Steam Flow/Feed Flow Mismatch logic actuation.

C. SI actuation may occur due to High Steam Line Flow with Low Tavg logic actuation.

D. MSIVs may close due to High Steam Line Flow with Low Tavg logic actuation.

.

NOTE:

SG:	Steam Generator
RO:	Reactor Operator
SI:	Safety Injection
MSIVs:	Main Steam Isolation Valves

Q #38

ANSWER: B

KA: 012A3.04

Ability to monitor automatic operation of the RPS, including Circuit Breaker 2.8/2.9

10CFR55: 41.7

Reference: 3-ONOP-003.6 CAUTION prior to Step 5 and Step 5
5610-T-D-17 Sheet 1, 5610-T-L1 Sheet 2, Sheet 19

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that 63% SG level is above the programmed level of 60% at 80% power. Note that the 3A feedwater controller has failed to MANUAL. The RO will therefore be operating the feedwater controller in MANUAL and attempting to reduce feed flow. A low level trip signal already exists due to the loss of 3P06. If the RO reduces feed flow too much below steam flow, an automatic reactor trip will actuate and reactor trip breakers will open.

New Question

Response Analysis:

A. Incorrect because the RO's actions will be lowering S/G level. Plausible because the loss of 3P06 has resulted in the logic for high SG level turbine trip logic being partially made-up and because a result of lowering 3A SG level is raising 3C SG level because its controller is in lockup and more water will be pushed past its reg valve.

B. Correct because a low level trip signal already exists due to the loss of 3P06. If the RO reduces feed flow too much below steam flow, an automatic reactor trip will actuate and reactor trip breakers will open.

C. Incorrect because the SI actuation logic will not be affected by the RO reducing feed flow. Plausible because the loss of 3P06 has resulted in the logic for High Steam Line Flow with Low Tavg being partially made up.

D. Incorrect because the MSIV Isolation actuation logic will not be affected by the RO reducing feed flow. Plausible because the loss of 3P06 has resulted in the logic for High Steam Line Flow with Low Tavg being partially made up.

Q #39 013K2.01

Which ONE of the following identifies the DC control power supply to the 3C Intake Cooling Water pump?

Vital DC Bus:

A. 3D01 ONLY

B. 4D23 ONLY

C. 4D01 OR 4D23

D. 3D01 OR 3D23

NOTE: DC: Direct Current

Q #39

ANSWER: C

KA: 013K2.01

Knowledge of the bus power supplies to the ESFAS/safeguards equipment control. 3.6/3.8

10CFR55: 41.7

Reference: 0-NOP-003.01 Step 5.1.1.A
SD-140 Page 42
SD-165 Page 7
5613-E-27 Sheet 2C

Cog Level: 1 Recall

The operator must first recall that the 3C ICW pump is powered from AC 4KV Bus 3D. Then the operator must recall that the DC control power to Bus 3D is selectable by an auto/manual transfer switch (3S75). This switch provides DC power from the opposite unit DC buses 4D01 or 4D23.

New Question

Response Analysis:

A. Incorrect because DC power is provided to 3C ICW pump from the opposite unit's DC buses 4D01 or 4D23. Plausible because the operator normally expects DC control power to come from the same Unit as the component.

B. Incorrect because DC power is provided to 3C ICW pump from the opposite unit's DC buses 4D01 or 4D23. Plausible because 4D23 is one of the two possible sources.

C. Correct per the references. DC power is provided to 3C ICW pump from the opposite unit's DC buses 4D01 or 4D23.

D. Incorrect because DC power is provided to 3C ICW pump from the opposite unit's DC buses 4D01 or 4D23. Plausible because the operator normally expects DC control power to come from the same Unit as the component.

Q #40 022K4.03

Unit 4 is at 100% power.

- A Steam Generator Tube Rupture occurs in the 4C Steam Generator.

Which ONE of the following describes the automatic plant response?

A. Both Phase "A" and Phase "B" Containment Isolation occurred.
Phase "B" isolated CCW to the NCCs.

B. Both Phase "A" and Phase "B" Containment Isolation occurred.
Phase "B" isolated CCW to the ECCs.

C. Only Phase "A" Containment Isolation occurred.
Phase "A" isolated CCW to the NCCs.

D. Only Phase "A" Containment Isolation occurred.
Phase "A" isolated CCW to the ECCs.

NOTE: CCW: Component Cooling Water
NCCs: Normal Containment Coolers
ECCs: Emergency Containment Coolers

Q #40

ANSWER: C

KA: 022K4.03

Knowledge of the CCS design feature(s) and/or interlock(s) which provide for Automatic Containment Isolation. 3.6/4.0

10CFR55: 41.7

Reference: 5610-T-L1 Sheet 11
5614-M-3030 Sheets 3 & 4

Cog Level: 2 Comprehension

Level 2 because the operator must realize that a SGTR will result in SI which will result in Phase "A" actuation but will not pressurize the containment (Note that Phase "A" can result from high containment pressure or from automatic SI actuation). Phase "B" does not occur because Phase "B" is strictly the result of very high containment pressure which is not postulated for a SGTR. Then the operator must recall that CCW to the NCCs is isolated as a result of Phase "A" actuation and that CCW to the ECCs is not isolated by either Phase "A" or Phase "B".

New Question

Response Analysis:

A. Incorrect because only Phase "A" Isolation occurred and Phase "A" isolated CCW to the NCCs. Plausible because Phase "A" did occur and because CCW is isolated to the NCCs.

B. Incorrect because only Phase "A" Isolation occurred and CCW was not isolated to the ECCs. Plausible because Phase "A" did occur and because ECCs are not needed for a SGTR which does not pressurize the containment.

C. Correct per the references and the discussion above. Only Phase "A" Containment Isolation occurred and Phase "A" isolated CCW to the NCCs.

D. Incorrect because Phase "A" does not isolate CCW to the ECCs. Plausible because only Phase "A" occurred and because ECCs are not needed for a SGTR which does not pressurize the containment.

Q #41 026A1.03

Operators are performing 3-EOP-ES-1.3, "Transfer to Cold Leg Recirculation."

- Containment Recirculation Sump level is 428 inches.
- RWST level is 62,000 gallons.

Which ONE of the following describes operation of the CSPs under these conditions?

A. Recirculation sump level is too low to allow operation of any CSPs.

B. RWST level is too low to allow operation of any CSPs.

C. Recirculation Sump level is high enough to allow operation of one CSP.

D. RWST level is high enough to allow operation of two CSPs.

NOTE: RWST: Refueling Water Storage Tank
CSPs: Containment Spray Pumps

Q #41

ANSWER: C

KA: 026A1.03

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including Containment sump level. 3.5/5.5 10CFR55: 41.5

Reference: 3-EOP-ES-1.3, CAUTION prior to Step 2 and basis , Step 2, Step 15 and basis, Step 20 and basis, Step 21 and basis, Step 26, Step 30 and basis, Step 31 and basis.

Cog Level: 2 Comprehension
Level 2 because the operator must first recall that anytime the RWST level is <155,000 gallons, If CSPs are pulling from the RWST, one CSP must be stopped due to NPSH concerns. When RWST level drops below 60,000 gallons, if the remaining CSP is still pulling from the RWST, it must be stopped because the RWST is considered empty. If the CSP has been realiged to take suction from a running RHR pump (which takes suction from the Recirc sump) a minimum of 427 inches of sump level is required to support RHR pump and therefore CSP operation.

New Question
PSA

Response Analysis:

A. Incorrect because recirc sump level is high enough to allow RHR pump and therefore CSP operation. Plausible because 428 inches is barely above the minimum level requirement.

B. Incorrect because the RWST level will not be too low to operate any CSPs until it decreases to 60,000 gallons. Plausible because 62,000 gallons is barely above the minimum level requirement.

C. Correct per the references and discussion above. Recirc sump level is high enough to allow operation of an RHR pump and therefore one CSP.

D. Incorrect because RWST level has to be above 155,000 gallons to allow operation of 2 CSPs. Plausible because 2 CSPs are initiall running and the operator may not recall which low level value requires dropping down to one running CSP.

Q #42 026A2.04

Operators are responding to a large break LOCA.

- While performing 3-EOP-E-0, 3A CSP casing ruptures.

Which ONE of the following describes the effect of this event and the correct operator response?

A. Only 3A CSP's suction pressure decreases.
The RWST will NOT drain out the break.
Operators should stop and locally isolate the 3A CSP.

B. Only 3A CSP's suction pressure decreases.
The RWST will drain out the break until isolated.
Operators should stop both CSPs, locally isolate the 3A CSP, and then restart the 3B CSP.

C. Both CSPs' suction pressure will decrease.
The RWST will NOT drain out the break.
Operators should stop and locally isolate the 3A CSP.

D. Both CSPs' suction pressure will decrease.
The RWST will drain out the break until isolated.
Operators should stop both CSPs, locally isolate the 3A CSP, and then restart the 3B CSP.

NOTE:

LOCA:	Loss of Coolant Accident
RWST:	Refueling Water Storage Tank
CSP:	Containment Spray Pump
3-EOP-E-0:	"Reactor Trip or Safety Injection",

Q #42

ANSWER: D

KA: 026A2.04

Ability to (a) predict the impacts of the failure of spray pump on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of that malfunction. 3.9/4.2 10CFR55: 41.5, 43.5

Reference: 3-EOP-E-0, Attachment 3, Step 15
5613-M-3062, Sheet 1 5613-M-3068, Sheet 1

Cog Level: 2 Comprehension
Level 2 because the operator must analyze plant conditions and determine that the CSPs share a common suction line with no automatic or remotely operated isolation valves. RWST water will drain out the Casing rupture (10" suction to CSPs). The shared CSP pump room will flood and the 3B CSP will lose suction pressure and be unable to pump. Operators will need to stop the CSPs (at least for personnel safety reasons), enter the CSP pump room and locally isolate the 3A CSP and subsequently restart the 3B CSP IAW 3-EOP-E-0, Attachment 3, Step 15 to help maintain safety equipment qualifications.

New Question

Response Analysis:

A. Incorrect because both CSPs will lose suction presure and the RWST will drain out the break. Plausible because the operators should stop and locally isolate the 3A CSP.

B. Incorrect because both CSPs will lose suction pressure. Plausible because the RWST will drain out the break and operators should stop both CSPs and subsequently restart the 3B CSP.

C. Incorrect because the RWST will drain out the break. Plausible because both CSPs will lose suction pressure and operators should stop and isolate 3A CSP.

D. Correct per the references and discussion above. Both CSPs' suction pressure will decrease, the RWST will drain out the break until isolated and operators should stop both CSPs, locally isolate the 3A CSP, and then restart the 3B CSP.

Q #43 039A1.05

Operators are performing a reactor startup on Unit 3.

- The 3A SDTA controller is being operated in automatic when its setpoint begins to continuously drift below 1000 psig.

Which ONE of the following describes the effect of this setpoint drift?

The 3A SDTA valve will:

A. OPEN, dumping more steam and lowering Tavg. If uncorrected, the 541°F minimum temperature for criticality Tech Spec limit may be violated.

B. OPEN, dumping more steam and lowering Tavg. If uncorrected, the 545°F minimum temperature for criticality Tech Spec limit may be violated.

C. CLOSE and stop dumping steam. 3B and 3C SDTA valves will open to relieve more steam and maintain Tavg within acceptable limits.

D. CLOSE and stop dumping steam. 3B and 3C SDTA valves will not respond and Tavg will increase above the limit of 549°F.

NOTE:

SDTA:	Steam Dump to Atmosphere
Psig:	pounds per square inch gauge
°F:	degrees Fahrenheit

Q #43

ANSWER: A

KA: 039A1.05

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including RCS T-ave. 3.2/3.3

10CFR55: 41.5

Reference: 5610-T-L1 Sheet 22A
4-GOP-301 Step 4.7 & 5.1
SD-105 Page 9

Cog Level: 2 Comprehension

Level 2 because the operator must recall how the SDTA controller operates while in automatic. Steam header pressure is compared to setpoint. If the setpoint decreases, the SDTA valve will open releasing more steam. This energy release will cool the RCS, lowering Tavg. If uncorrected the minimum temperature for criticality Tech Spec limit of 541°F may be violated.

New Question

Response Analysis:

A. Correct per the references and the discussion above.

B. Incorrect because the minimum temperature for criticality limit is 541°F, not 545°F. Plausible because the SDTA valve will open, lowering Tavg.

C. Incorrect because the SDTA valve will open, not close. Plausible because 3B and 3C SDTA valves will open to relieve more steam.

D. Incorrect because then SDTA valve will open, not close and the 3B and 3C SDTA valves should respond. Plausible because the procedurally set upper limit for Tavg is 549°F.

Q #44 059K3.03

Unit 3 is at 70% power.

- The 3B SGFP trips.

Which ONE of the following describes the effect of this event on plant operation?

A Turbine runback:

A. will NOT occur. Steam Generator levels will decrease but will recover to programmed level of 60% NR.

B. will NOT occur. Steam Generator levels will decrease but will recover to programmed level of 50% NR.

C. to 45% power will occur. Steam Generator levels will decrease but will recover to programmed level of 60% NR.

D. to 60% power will occur. Steam Generator levels will decrease but will recover to programmed level of 50% NR.

NOTE: SGFP: Steam Generator Feed Pump
NR: Narrow Range

Q #44

ANSWER: C

KA: 059K3.03

Knowledge of the effect that a loss or malfunction of the MFW will have on the S/Gs. 3.5/3.7

10CFR55: 41.7

Reference: 3-ONOP-089 Steps 2.1.7, 3.4, 3.6, 4.1, 5.2.1
5610-T-D-17, Sheet 1 5610-T-L1 Sheet 21

Cog Level: 2 Comprehension

Level 2 because the operator must realize that a turbine runback will occur because a SGFP breaker has opened when power is >45%. SG levels will decrease and return to program. Program is based on power level so the operator must know how far the runback will lower power (45%) and what the programmed level is at 45% power (60%).

New Question

Response Analysis:

A. Incorrect because a turbine runback will occur. Plausible because SG levels will recover to 60%.

B. Incorrect because a turbine runback will occur. Plausible because 50% NR is the programmed SG level at lower levels.

C. Correct per the references and discussion above. A runback to 45% power will occur and SG levels will recover and return to 60% programmed value.

D. Incorrect because SG levels will recover to 60%, not 50% and the runback will be to 45%, not 60%. Plausible because a turbine runback will occur and 60% is the old value at which the turbine runback terminated.

Q #45 061K4.06

Unit 3 is in Mode 3.

- The 3B 4KV Bus Startup Transformer breaker, 3AB05, trips open.

Which ONE of the following describes the direct effect of this event on the AFW system?

A. Only MOV-3-1403 and MOV-3-1404 will automatically open providing main steam to Train 2 AFW pump(s) only.

B. Only MOV-3-1403 and MOV-3-1404 will automatically open providing main steam to all AFW pumps

C. Only MOV-3-1404 and MOV-3-1405 will automatically open providing main steam to Train 1 AFW pump(s) only.

D. Only MOV-3-1404 and MOV-3-1405 will automatically open providing main steam to all AFW pumps

NOTE:

MOV-3-1403:	3A Steam Supply to Aux Feedwater Pumps
MOV-3-1404:	3B Steam Supply to Aux Feedwater Pumps
MOV-3-1405:	3C Steam Supply to Aux Feedwater Pumps
AFW:	Auxiliary Feedwater
KV:	Kilovolt

Q #45

ANSWER: A

KA: 061K4.06

Knowledge of AFW design feature(s) and/or interlock(s) which provide for AFW startup permissives 4.0/4.2

10CFR55: 41.7

Reference: 5610-T-L1 Sheet 15
5613-M-3075 Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recall that the de-energizing of 3B 4KV Bus will send an open signal to AFW steam supplies MOV-1403 and 1404 only (MOV-1405 does not get an open signal for the loss of 3B 4kv bus.). Then the operator must recall that opening MOV-1403 and MOV-1404 are the steam supplies to Train 2 AFW pumps only.

Modified from Bank - 69021230617

Response Analysis:

A. Correct per the references and the discussion above. MOV-1403 and 1404 open and provide steam to Train 2 AFW pumps.

B. Incorrect because MOV-1403 and 1404 provide steam to Train 2 pumps only. Plausible because if MOV-1404 and 1405 opened (loss of 3A Bus), steam would be provided to all AFW pumps.

C. Incorrect because MOV-1403 and 1404 are the valves that open. Plausible because MOV-1404 does open during this event and if MOV-1405 opened, steam would be provided to the Train 1 pump.

D. Incorrect because MOV-1403 and 1404 are the valves that open. Plausible because if MOV-1404 and 1405 opened, steam would be provided to all AFW pumps.

Q #46 061K6.02

The AFW system receives an auto-start signal while Unit 3 is in Mode 3.

- "A" AFW pump trips on over-speed.

Which ONE of the following describes the effect of this event on Train 1 AFW flow control valves?

The Train 1 AFW flow control valves will:

A. NOT receive an open signal.

B. receive an open signal and go to and remain in the full open position.

C. receive an open signal but will remain closed position.

D. receive an open signal and go to their preset intermediate position.

NOTE: AFW: Auxiliary Feedwater

Q #46

ANSWER: B

KA: 061K6.02

Knowledge of the effect of a loss or malfunction of the pumps will have on the AFW components. 2.6/2.7

10CFR55: 41.7

Reference: 5610-T-L1 Sheet 15
3-OSP-075.10 Step 4.2
SD-117 Pages 12, 16 and 17

Cog Level: 2 Comprehension

Level 2 because the operator must first recall that the open signal to the flow control valves comes from the opening of the steam supply valves which opened as a result of the auto-start signal. Then the operator must recall that the flow control valves are maintained in AUTO with a preset flowrate (130 gpm) demanded. When they get their open signal and do not have any flow from the tripped pump they will go fully open (actual flow is less than demanded flow so the controller tells the valve to be full open).

Modified from Bank: 69021230614

Response Analysis:

A. Incorrect because the flow control valves received an open signal from the steam supply valves which opened. Plausible because the Train 1 flow control valves will get no flow from the tripped pump and with no flow have no need of an open signal.

B. Correct because the flow control valves received an open signal and they will go to the fully open position.

C. Incorrect because the flow control valves will go to the fully open position. Plausible because the flow control valves will receive an open signal.

D. Incorrect because the flow control valves will go to the fully open position. Plausible because they will get an open signal and the controllers do have a preset demand for 130 gpm.

Q #47 062K1.03

Unit 4 is in Mode 6.

- The 4A 4KV Bus and its associated 480V Load Centers are out of service.
- The DC input breaker to 4A Inverter trips open and cannot be reclosed.

Which ONE of the following describes the effect on the plant and the correct operator response?

Vital AC Bus 4P07 will:

A. automatically be powered from the AS Inverter.
Operators will manually transfer 4P07 from the AS Inverter to the CVT.

B. automatically be powered from its back-up CVT
Operators will manually transfer 4P07 from the CVT to the AS Inverter.

C. de-energize.
Operators will manually transfer 4P07 to the AS Inverter.

D. de-energize.
Operators will manually transfer 4P07 to its back-up CVT.

NOTE:

CVT:	Constant Voltage Transformer
KV:	Kilovolt
V:	Volt
DC:	Direct Current
AC:	Alternating Current

Q #47

ANSWER: C

KA: 062K1.03

Knowledge of the physical connections and/or cause-effect relationships between the AC distribution system and the DC distribution. 3.5/4.0

10CFR55: 41.2 to 41.9

Reference: 4-ONOP-003.7 Attach. 1, Step 5 5610-T-E-1591 Sheet 1
SD-144 Page 16 5610-T-E-1592 Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must recall that the back-up CVT to the 4A Inverter is powered from 4C MCC which is OOS. The CVT will no longer be a viable source of power to 4P07 for either automatic or manual transfer. 4P07 would normally auto-transfer to the CVT. Unable to auto-transfer, 4P07 de-energizes. Operators will perform 4-ONOP-003.7 which directs them to swap 4P07 to the AS Inverter.

New Question

Response Analysis:

A. Incorrect because 4P07 will de-energize and operators will not manually transfer 4P07 from the AS inverter to the CVT. Plausible because the AS inverter is the designated backup for manual transfer of 4P07.

B. Incorrect because 4P07 will de-energize. Plausible because this would be the correct answer if the 4A 4KV Bus and its load centers were not OOS.

C. Correct per the references. 4P07 will de-energize because its back-up CVT has no power. ONOP-003.7 will direct the operators to manually transfer 4P07 to the AS Inverter.

D. Incorrect because 4P07 cannot be manually transferred to its back-up CVT. Plausible because 4P07 will de-energize.

Q #48 063K2.01

Which ONE of the following identifies the normal DC power supply to Unit 3 ASP?

Panel 3P93 is powered from:

A. 3A Inverter, which is powered from 3A DC Bus.

B. AS Inverter, which is powered from 3A DC Bus.

C. 3C Inverter, which is powered from 3B DC Bus.

D. CS Inverter, which is powered from 3B DC Bus.

NOTE: ASP: Alternate Shutdown Panel
DC: Direct Current

Q #48

ANSWER: C

KA: 063K2.01

Knowledge of bus power supplies to Major DC Loads. 2.9/3.1

10CFR55: 41.7

Reference: 0-OP-003.3 Step 4.23
5610-T-E-1592 Sheet 1
SD-153 Page 42

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the 3B DC Bus powers the 3C Inverter which powers 3P93 which powers the ASP. Plausible because the 3A Inverter is powered from the 3A Bus and Unit 3 components (like the Unit 3 ASP) are expected to be powered from a Unit 3 DC Bus.

B. Incorrect because the 3B DC Bus powers the 3C Inverter which powers 3P93 which powers the ASP. Plausible because the AS Inverter is powered from the 3A Bus and Unit 3 components (like the Unit 3 ASP) are expected to be powered from a Unit 3 DC Bus.

C. Correct per the references. The 3B DC Bus powers the 3C Inverter which powers 3P93 which powers the ASP.

D. Incorrect because the 3B DC Bus powers the 3C Inverter which powers 3P93 which powers the ASP. Plausible because this is the alternate power supply to the Unit 3 ASP.

Q #49 064G2.4.30

Both Units are at 100% power.

- Unit 3 Startup transformer is out of service.
- 3A EDG Lube Oil Outlet temperature is 84°F.

Which ONE of the following describes the effect on EDG operability and the reportability to the NRCOC?

The 3A EDG is:

A. OPERABLE.
Notification to the NRCOC is NOT required.

B. OPERABLE.
This event shall be reported to the NRCOC.

C. INOPERABLE.
Notification to the NRCOC is NOT required.

D. INOPERABLE.
This event shall be reported to the NRCOC.

NOTE: EDG: Emergency Diesel Generator
NRCOC: Nuclear Regulatory Commission Operations Center
°F: degrees Fahrenheit

Q #49

ANSWER: D

KA: 064G2.4.30

As it relates to the EDGs: 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. 2.7/4.1

10CFR55: 41.10, 43.5

Reference: TS 3.8.1.1, O-ADM-115, Enclosure 1 Page 1
5613-T-L1 Sheet 9A7 3-OP-023 Step 4.33 3-ARP-097.CR F8/2

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that 84°F is below the operability threshold of 85°F and the EDG must be declared inoperable. Then the operator must recall the guidance of ADM-115 that states that with one SU transformer and one of the required EDGs inoperable, a report must be made to the NRC. Finally the operator must recall the EDG LCO that requires both Unit 3 EDGs are required be operable in these conditions.

New Question

Response Analysis:

A. Incorrect because 3A EDG is inoperable IAW 3-OP-023, Step 4.33. Plausible because the lube oil temperature is only 1°F below the threshold of operability and because if the EDG were operable, notification would not be required.

B. Incorrect because 3A EDG is inoperable IAW 3-OP-023, Step 4.33. Plausible because the Unit 3 SU transformer is OOS and if not inoperable, the EDG is in a degraded condition.

C. Incorrect because notification to the NRC is required. Plausible because the EDG is inoperable and inoperability of equipment is not always reportable to the NRCOC.

D. Correct per the references and the above discussion. The 3A EDG is inoperable and the event is reportable.

Q #50 064K3.02

Unit 3 is in Mode 1 when a LOCA occurs.

- The Reactor trips and SI actuates.
- The Switchyard de-energizes.
- 3B EDG locks out and cannot be restarted.

Which ONE of the following describes the effect on HHSI pumps operation?

Operators will:

A. stop both Unit 4 HHSI pumps and maintain Unit 4 HHSI pumps suction aligned to the Unit 4 RWST.

B stop one Unit 4 HHSI pump and realign the Unit 4 HHSI pumps suction to the Unit 3 RWST.

C maintain all available HHSI pumps running and realign the Unit 4 HHSI pumps suction to the Unit 3 RWST.

D maintain all available HHSI pumps running and maintain Unit 4 HHSI pumps suction aligned to the Unit 4 RWST.

NOTE:

LOCA:	Loss of Coolant Accident
SI:	Safety Injection
EDG:	Emergency Diesel Generator
HHSI:	High Head Safety Injection
RWST:	Refueling Water Storage Tank

Q #50

ANSWER: B

KA: 064K3.02

Knowledge of the effect that a loss or malfunction of the EDG system will have on ESFAS controlled or actuated systems 4.2/4.4

10CFR55: 41.7

Reference: 3-EOP-E-0, Step 9 RNO

Cog Level: 2 Comprehension

Level 2 because the operator will have to determine that the loss of the 3B EDG means that the 3B HHSI pump will have no power. Therefore operators cannot verify two Unit 3 HHSI pumps running and must employ one or more Unit 4 HHSI pumps to meet the requirement for two HHSI pumps running. However two Unit 4 HHSI pumps started so a total of three pumps are running so one pump must be stopped. The RO will stop one of the Unit 4 HHSI pumps and will then direct the Unit 4 RO to align Unit 4 HHSI pumps suction to Unit 3 RWST.

New Question

PSA

Response Analysis:

A. Incorrect because the RO will stop only one Unit 4 HHSI pump and will realign the system. Plausible because this is the action that is normally done when this step is encountered in E-0.

B. Correct per the reference and discussion above. One Unit 4 HHSI pump will be stopped and the system will be realigned.

C. Incorrect because 3 HHSI pumps are running and the requirement is for two HHSI pumps running. Plausible because the system will be realigned.

D. Incorrect because 3 HHSI pumps are running and the requirement is for two HHSI pumps running and the system will be realigned. Plausible because this action will provide maximum pump capacity and maximum RWST availability to mitigate the LOCA.

Q #51 073K5.01

Which ONE of the following describes R-20 and how the effects of N-16 gamma radiation are minimized?

R-20 is a:

A. Geiger-Mueller detector that does NOT distinguish between radiation energy levels. N-16 gamma is minimized by the long transit time from the reactor to the detector.

B. scintillation detector that does NOT distinguish between radiation energy levels. N-16 gamma is minimized by the long transit time from the reactor to the detector.

C. Geiger-Mueller detector that distinguishes between radiation energy levels. N-16 gamma is minimized by the shielding provided by the steel pipe wall of the letdown line.

D. scintillation detector that distinguishes between radiation energy levels. N-16 gamma is minimized by the shielding provided by the steel pipe wall of the letdown line.

NOTE: R-20: Reactor Coolant Letdown Line Radioactivity Monitor
N-16: Nitrogen-16

Q #51

ANSWER: A

KA: 073K5.01

Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Radiation Theory, including sources, types, units and effects. 2.5/3.0

10CFR55: 41.5

Reference: 0-NCOP-067 Step 7.8.1 & NOTE prior to Step 7.8.2
LP 6902168 Pages 31 & 91
SD-068 Figure 3

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. R-20 is a GM tube that does not distinguish between energy levels of radiation and N-16 gamma is minimized by letdown line transit time.

B. Incorrect because R-20 is a GM tube. Plausible because the effects of N-16 gamma radiation are primarily minimized by the long transit time from the reactor to the detector.

C. Incorrect because GM detectors cannot distinguish between energy levels of radiation and N-16 gamma is minimized by letdown line transit time. Plausible because R-20 is a GM tube.

D. Incorrect because R-20 is a GM tube, and N-16 gamma is minimized by letdown line transit time. Plausible because most of the process radiation monitors are scintillation detectors which distinguish between energy levels of incident radiation and the steel piping wall does provide some shielding.

Q #52 076G2.1.3

Unit 4 is in Mode 5 and operators are aligning the ICW System for single pump operation.

Which ONE of the following describes how operators will adjust total ICW flow?

A. Reduce ICW flow to less than 19,000 gpm by reducing ICW flow to the TPCW HXs only.

B. Reduce ICW flow to less than 19,000 gpm by isolating ICW flow to the TPCW HXs AND reducing ICW flow to the CCW HXs.

C. Maintain ICW flow greater than 19,000 gpm by increasing ICW flow to the TPCW HXs AND increasing ICW flow to the CCW HXs.

D. Maintain ICW flow greater than 19,000 gpm by increasing ICW flow to the CCW HXs only.

NOTE:

ICW:	Intake Cooling Water
TPCW HXs:	Turbine Plant Cooling Water Heat Exchangers
CCW HXs:	Component Cooling Water Heat Exchangers
gpm:	gallons per minute

Q #52

ANSWER: B

KA: 076G2.1.3

As it relates to the Service Water System (ICW), Ability to perform specific system and integrated plant procedures during all modes of plant operation. 4.3/4.4

10CFR55: 41.10, 43.5

Reference: 4-OP-019 Step 4.14, 7.10.1.2, 7.10.2.1, 7.10.2.5

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because operators will isolate flow to the ICW HXs and reduce flow to the CCW HXs.. Plausible because ICW flow needs to be reduced to < 19,000 gpm and because the need of ICW/TPCW cooling in Mode 5 is minimal or non-existent.

B. Correct because operators will reduce ICW flow to less than 19,000 gpm by isolating ICW flow to the TPCW HXs AND reducing ICW flow to the CCW HXs.

C. Incorrect because operators are directed to reduce flow to < 19,000 gpm, not maintain flow above 19,000 gpm. Plausible because single pump operation implies lower overall ICW flow rates which suggests the need to establish a minimum ICW flow rate and because increasing ICW flow to the TPCW and CCW HXs would accomplish that goal of maintaining a minimum flow rate.

D. Incorrect because operators are directed to reduce flow to < 19,000 gpm, not maintain flow above 19,000 gpm. Plausible because single pump operation implies lower overall ICW flow rates which suggests the need to establish a minimum ICW flow rate and because increasing ICW flow to the CCW HXs would accomplish that goal of maintaining a minimum flow rate.

Q #53 076K4.06

Which ONE of the following identifies the normal ICW system alignment as it relates to train separation?

The ICW headers to the CCW Heat Exchangers are _____ and _____ ICW pumps are always powered from separate trains.

A. separated
"A" and "B"

B. separated
"B" and "C"

C. cross-connected
"A" and "B"

D. cross-connected
"B" and "C"

NOTE: ICW: Intake Cooling Water
CCW: Component Cooling Water

Q #53

ANSWER: C

KA: 076K4.06

Knowledge of SWS design feature(s) and/or interlock(s) which provide for Service water (ICW) train separation. 2.8/3.2

10CFR55: 41.7

Reference: 4-OP-019 Attachment 1 Pages 2 , 5 & 6
5614-M-3019, Sheets 1 and 2
SD-165 Page 7 SD-140 Page 7

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the ICW headers to the CCW HXs are cross-connected. Plausible because "A" and "B" ICW pumps are always powered from separate trains.

B. Incorrect because the ICW headers to the CCW HXs are cross-connected. Plausible because "B" and "C" ICW pumps are powered from separate trains when "A" ICW pump is OOS.

C. Correct per the references. The ICW headers to the CCW HXs are cross-connected. and the "A" and "B" ICW pumps are always powered from separate trains.

D. Incorrect because "B" and "C" ICW pumps are not always powered from separate trains. Plausible because the ICW headers to the CCW HXs are cross-connected.

Q #54 078A3.01

Operators are responding to a large Instrument Air (IA) leak on Unit 3.

Which ONE of the following identifies how low IA pressure will go on the Unit 4 Instrument Air Pressure indicator, PI-4-1444 and actions required by the Unit 4 operators?

A. 75 psig. Trip Unit 4 and enter 4-EOP-E-0.

B. 75 psig. Start any available instrument air compressor.

C. 88 psig. Trip Unit 4 and enter 4-EOP-E-0.

D. 88 psig. Start any available instrument air compressor.

NOTE: psig: pounds per square inch gauge
4-EOP-E-0: "Reactor Trip or Safety Injection"

Q #54

ANSWER: B

KA: 078A3.01

Ability to monitor automatic operation of the IAS, including Air pressure. 3.1/3.2

10CFR55: 41.7

Reference: 0-ONOP-013 Steps 1, 2, 4, NOTE prior to Step 11
3-OP-013 Step 4.1.2
LP 6900145 Page 49 of 117, Figure 1
SD-155 Page 9

Cog Level: 1 Recall

Modified from Bank - 69021450609

Response Analysis:

A. Incorrect because Unit 4 does not have to be tripped until its IA pressure drops to 65 psig. Plausible because 75 psig is the lowest expected IA pressure for Unit 4 due to this Unit 3 air leak.

B. Correct because 75 psig is the lowest expected IA pressure for Unit 4 due to this Unit 3 air leak and Unit 4 operators are directed to start any available air compressor.

C. Incorrect because 75 psig is the lowest expected IA pressure for Unit 4 due to this Unit 3 air leak and Unit 4 operators are directed to start any available air compressor. Plausible because 88 psig is the pressure at which the unit separation valves will begin to close and the operators may have to trip Unit 4 if pressure drops lower.

D. Incorrect because 75 psig is the lowest expected IA pressure for Unit 4 due to this Unit 3 air leak. Plausible because Unit 4 operators are directed to start any available IA compressor.

Q #55 103G2.2.36

Unit 3 is in Mode 4.

Maintenance has requested to remove power from MOV-3-381 and maintain the valve fully open while work is performed on the valve motor.

This request should:

A. NOT be granted because maintaining MOV-3-381 fully open would result in exceeding the thermal limits of the Seal Water HX.

B. NOT be granted because it would place the unit in non-compliance with the Containment Integrity Limiting Condition for Operation.

C. be granted because Unit 3 is in Mode 4 and the Containment Integrity Limiting Condition for Operation is NOT applicable.

D. be granted because RCP Seal Return is a non-safety related flow path and the Containment Integrity Limiting Condition for Operation is NOT applicable

NOTE:

MOV-3-381:	Excess Letdown and RCP Seal Return to VCT
HX:	Heat Exchanger
RCP:	Reactor Coolant Pump
VCT:	Volume Control Tank

Q #55

ANSWER: B

KA: 103G2.2.36

As it relates to the Containment system: Ability to analyze the effect of maintenance activities, such as degraded power sources, on the Limiting Conditions for Operations 3.1/4.2

10CFR55: 41.10, 43.2

Reference: Tech Spec Section 1.7, Section 3.6.1.1
5613-M-3047, Sheet 3

Cog Level: 2 Comprehension

Level 2 because the operator must recognize that MOV-381 is a containment isolation valve that protects a penetration as described in TS Section 1.7, Definition of Containment Integrity. Then the operator must recall that the Containment Integrity LCO applies in Mode 4 and that leaving this valve in the open position causes non-compliance with the Containment Integrity LCO.

New Question

Response Analysis:

A. Incorrect because MOV-3-381 is normally fully open and the thermal limits of the seal water heat exchanger are not approached. Plausible because excess letdown may be in service in Mode 4 placing some heat load on the seal water heat exchanger.

B. Correct per the references and discussion above. This is a containment integrity valve that closes on Phase "A" Containment Isolation. Leaving it open with power removed would result in non-compliance with TS 3.6.1.1.

C. Incorrect because the request should not be granted. Plausible because the operator may not recognize this a containment integrity valve or may not recognize that the LCO applies in Mode 4.

D. Incorrect because the request should not be granted. Plausible because RCP seal return is not normally thought of as safety related process flow.

Q #56 011K6.03

Unit 3 is at 100% power.

The Tavg signal to the Pressurizer level control program rapidly fails low.

In the absence of operator response, which ONE of the following describes the effect on Pressurizer level and the Pressurizer heaters?

Pressurizer level will:

A. increase.
Backup Heaters "A" & "B" will automatically turn on and stay on.

B. decrease.
Backup Heaters "A" & "B" will automatically turn on and stay on.

C. increase.
Backup Heaters "A" & "B" will automatically turn on and subsequently automatically turn off.

D. decrease.
Backup Heaters "A" & "B" will automatically turn on and subsequently automatically turn off.

Q #56

ANSWER: D

KA: 011K6.03

Knowledge of the effect of a loss or malfunction on the Relationship between PZR level and PZR heater control circuit will have on the PZR LCS. 2.9/3.3

10CFR55: 41.7

Reference: 5610-T-D-15 Sheet 1

Cog Level: 2 Comprehension

Level 2 because the operator must realize that the Tavg input failing low will cause the Pressurizer level program to demand 22% level. The running Charging pump will slow down and level will drop from 53% to 22%. Backup heaters will automatically energize initially because the actual level will be more than 5% above programmed level. As actual level drops below 27%, the backup heaters will automatically de-energize.

New Question

Response Analysis:

A. Incorrect because Pressurizer level will decrease and Pressurizer heaters will subsequently turn off. Plausible because if the level did increase, the backup heaters may turn on as a result of subcooled water entering the pressurizer from the loops.

B. Incorrect because Pressurizer heaters will subsequently turn off. Plausible because Pressurizer level will decrease.

C. Incorrect because Pressurizer level will decrease. Plausible because if the level did increase, the backup heaters may turn on as a result of subcooled water entering the Pressurizer from the loops and would turn off when pressure returned to normal.

D. Correct per the reference and discussion above. Pressurizer level will decrease and Backup Heaters "A" & "B" will automatically turn on and subsequently automatically turn off.

Q #57 014G2.4.35

While performing 3-EOP-ES-0.1, "Reactor Trip Response," the RO notes that all RPIs indicate zero steps and all rod bottom lights are out.

The RO is unable to initiate Emergency Boration from the BASTs.

Which ONE of the following describes the directions the RO will give to the plant operator and the effect of the plant operator's action?

A. "Open breaker 30669 for LCV-3-115C."
LCV-3-115C will remain closed after the RO releases its control switch.

B. "Isolate Instrument Air to FCV-3-113A."
Establishes an alternate boric acid path from the BASTs.

C. "Isolate Instrument air to LCV-3-115B."
Borated water from the RWST will flow to the Charging pump(s) suction.

D. "Open 3-358."
Borated water from the RWST will flow to the Charging pump(s) suction.

NOTE:

FCV-3-113A:	Boric Acid to Blender valve
LCV-3-115B:	Charging Pump RWST Suction Isolation valve
LCV-3-115C:	Charging Pump VCT Suction Isolation valve
3-358:	Charging Pump Suction from RWST valve
30669:	LCV-3-115C breaker
RO:	Reactor Operator
BASTs:	Boric Acid Storage Tanks
RPIs:	Rod Position Indicators
RWST:	Refueling Water Storage Tank

Q #57

ANSWER: A

KA: 014G2.4.35

As it relates to the Rod Position Indication: Knowledge of the local auxiliary operator tasks during an emergency and the resultant operational effects. 3.8/4.0
10CFR55: 41.10, 43.5

Reference: 3-EOP-ES-0.1, Step 5
3-ONOP-046.1, Step 2.4.2 & Step 1.c.RNO 3

Cog Level: 2 Comprehension

Level 2 bcause the question does not state why boric acid flow cannot be obtained from the Boric Acid Storage tanks. The operator has to recall that ONOP-046.1 provides solutions for two different possible malfunctions; the failure of boric acid pumps to start and the failure of MOV-350 to open. 3 of the 4 four responses are viable for producing borated flow but only one is procedurally driven. The operator must choose the one that helps to solve the problem as directed by ONOP-046.1.
New Question

PSA

Response Analysis:

A. Correct per 3-ONOP-046.1 because the RO will direct the plant operator to open breaker 30669 for LCV-3-115C to maintain LCV-3-115C closed after the RO releases its control switch..

B. Incorrect because the RO will direct the plant operator to open breaker 30669 for LCV-3-115C. Plausible because FCV-3-113A is the fail-open boric acid to blender valve. It would provide the maximum boric acid flow that the blender can deliver from the BASTs.

C. Incorrect because the RO will direct the plant operator to open breaker 30669 for LCV-3-115C. Plausible because LCV-3-115B is an air operated valve that when opened will deliver borated water flow from the RWST to the charging pump suction.

D. Incorrect because the RO will direct the plant operator to open breaker 30669 for LCV-3-115C. Plausible because when opened 3-358 will deliver borated water flow from the RWST to the charging pump suction.

Q #58 016K3.07

Unit 4 is at 100% power when Turbine first stage pressure transmitter PT-4-447 fails low.

Which ONE of the following describes the effect of this failure on Unit 4?

A. High steam flow signals for Safety Injection logic will be generated. HHSI pumps will NOT automatically start.

B. High steam flow signals for Safety Injection logic will be generated. HHSI pumps will automatically start.

C. Steam flow/Feed flow signals for Reactor Trip logic will be generated. Reactor Trip will NOT occur.

D. Steam flow/Feed flow signals for Reactor Trip logic will be generated. Reactor Trip will occur.

Q #58

ANSWER: A

KA: 016K3.07

Knowledge of the effect of a loss or malfunction of the NNIS will have on the ECCS. 3.6/3.7

10CFR55: 41.7

Reference: SD-063 Page 48, Figure 26A,
5610-T-D-18A, 5610-T-D-18B

Cog Level: 2 Comprehension

Level 2 because the operator will have to recall that turbine first stage pressure has input to the high steam flow logic for safety injection but does not have input to the steam flow/feed flow logic for reactor trip (common misperception). Additionally PT-447 will effectively reduce the set point for tripping the high steam flow bistables from 120% to 40% steam flow (Actual steam flow rate is 100%). The bistables will trip, injecting high steam flow signals into the SI logic. However this is not enough to actuate SI or start the HHSI pumps. Low Tavg or low SG pressure would also have to be present to initiate SI.

New Question

Response Analysis:

A. Correct per the references and discussion above. High steam flow signals for safety injection logic will be generated. HHSI pumps will not automatically start.

B. Incorrect because HHSI pumps will not automatically start. Plausible because high steam flow signals for Safety Injection logic will be generated.

C. Incorrect because Steam flow/Feed flow signals for Reactor Trip logic will not be generated. Plausible because operator trainees often confuse the high steam flow SI logic with the steam flow/feed flow reactor trip logic.

D. Incorrect because Steam flow/Feed flow signals for Reactor Trip logic will not be generated. Plausible because operator trainees often confuse the high steam flow SI logic with the steam flow/feed flow reactor trip logic.

Q #59 017K4.03

Which ONE of the following describes the range and critical temperature value associated with the CETs?

CETs can read up to _____.

_____ is the threshold temperature that indicates the onset of Zirc-Water reaction.

A. 2300°F.
1200°F

B. 3200°F.
700°F

C. 2300°F.
700°F

D. 3200°F.
1200°F

NOTE: CETs: Core Exit Thermocouples
°F: degrees Fahrenheit

Q #59

ANSWER: A

KA: 017K4.03

Knowledge of ITM system design feature(s) and/or interlock(s) which provide for Range of temperature indication 3.1/3.3

10CFR55: 41.7

Reference: BD-EOP-F-0 Page 20, BD-EOP-FR-C.1 Page 19, Step 8
LP-6902926 Page 45

Cognitive Level: 1 Recall

New Question

Response Analysis:

A. Correct per the references. CETs can read up to 2300°F. 1200°F indicates the onset of Zirc-Water reaction.

B. Incorrect because 1200°F indicates the onset of Zirc-Water reaction and because CETs can read up to 2300°F. Plausible because 3200°F is the temperature at which zirconium alloy melts and 700°F based on CET temperatures is the threshold that indicates superheat at the core exit and indicates an orange path on Core Cooling.

C. Incorrect because 1200°F indicates the onset of Zirc-Water reaction. Plausible because CETs can read up to 2300°F.

D. Incorrect because CETs can read up to 2300°F. Plausible because 1200°F indicates the onset of Zirc-Water reaction.

NOTE:
Basis for incorrect values chosen for distractors:
700°F is the threshold temperature that indicates superheat at the core exit.
3200°F is the approximate melting temperature for zircaloy cladding.

Q #60 027A4.04

Operators are responding to a Small Break LOCA on Unit 3.

- Containment pressure peaked at 12 psig.
- Three hours after event initiation the 3C ECF fan fails.
- The RO observes dual light indication (Both red and green lights on) for the 3C ECF Spray valves.

Which ONE of the following describes the 3C ECF spray system response and the effect on 3C ECF charcoal bed temperatures?

A. Both ECF spray valves are open.
3C ECF charcoal bed is being sprayed.
3C ECF charcoal temperatures will decrease.

B. Both ECF spray valves are open.
3C ECF charcoal bed is NOT being sprayed.
3C ECF charcoal temperatures will increase.

C. Only one ECF spray valve is open.
3C ECF charcoal bed is being sprayed.
3C ECF charcoal temperatures will decrease.

D. Only one ECF spray valve is open.
3C ECF charcoal bed is NOT being sprayed.
3C ECF charcoal temperatures will increase.

NOTE: LOCA: Loss of Coolant Accident
ECF: Emergency Containment Filter
RO: Reactor Operator

Q #60

ANSWER: D

KA: 027A4.04

Ability to manually operate and/or monitor in the control room: Filter temperature. 2.8/2.9

10CFR55: 41.7

Reference: SD-029 Page 14 & Figure 6A , 3-OSP-056.2 Section 7.11

Cog Level: 2 Comprehension

Level 2 because the operator must recall that the source of ECF spray flow is the containment spray system. Containment spray has not actuated because containment pressure did not reach 20 psig. There is no water available to the ECFs. Additionally dual light indication means that only one spray valve has opened (one set of red & green lights are shared by both spray valves). Finally the ECF charcoal temperatures will increase, not decrease.

New Question

Response Analysis:

A. Incorrect because only one spray valve is open and the charcoal bed is not being sprayed. Plausible because if the bed was being sprayed, charcoal temperatures could be expected to decrease.

B. Incorrect because only one spray valve is open. Plausible because the charcoal bed is not being sprayed and because if the bed was not being sprayed, charcoal temperatures could be expected to increase.

B. Incorrect because the charcoal bed is not being sprayed and charcoal temperatures are expected to increase. Plausible because Only one ECF valve is open.

D. Correct per the references and discussion above. Only one ECF spray valve is open and 3C ECF charcoal bed is NOT being sprayed and 3C ECF charcoal temperatures will increase.

Q #61 035A1.01

Operators are performing a plant start up on Unit 4.

- SG narrow range level is 45% and stable.
- 4A SG level controller is placed in AUTO.
    - Subsequently, the pressure compensation input to the 4A SG level control system fails high.

Which ONE of the following describes the initial and subsequent operation of the 4A feed reg valve?

When the controller is first placed in AUTO, the 4A feed reg valve will (1)_____.

When the pressure compensation fails high, the 4A feed reg valve will (2)_____ to match feed flow with steam flow.

A. (1) maintain feed flow matched with steam flow.
(2) open

B. (1) maintain feed flow matched with steam flow.
(2) close

C. (1) open to control SG level at 50%.
(2) open

D. (1) open to control SG level at 50%.
(2) close

NOTE: SG: Steam Generator

Q #61

ANSWER: C

KA: 035A1.01
Ability to (a) predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the S/GS controls including S/G wide and narrow range level during startup, shutdown, and normal operations. 3.6/3.8
10CFR55: 41.5

Reference: 4-GOP-301 Step 5.61,
SD-11 pages 31, 32, 41 & figures 12, 14, & 15

Cog Level: 2 Comprehension
Level 2 because the operator must recall that the power level that the feed reg valves are placed in AUTO is between 10% and 20%. At this power level the programmed SG level is 50%. With the initial SG level at 45%, the feed reg valves will open to control SG level at 50%. Subsequently when the pressure compensation fails high the steam flow input into the controller will also fail high. Sensing steam flow greater than feed flow, the reg valve will open to match feed flow with steam flow.

New Question

Response Analysis:

A. Incorrect because the 4A feed reg valve will open to control SG level at 50%. Plausible because while level dominant, the controller is designed to match feed flow with steam flow when level is on program and the feed reg valve will open to match feed flow with steam flow.

B. Incorrect because the 4A feed reg valve will open to control SG level at 50%. Plausible because while level dominant, the controller is designed to match feed flow with steam flow when level is on program.

C. Correct per the references and discussion above. When the controller is first placed in AUTO, the 4A feed reg valve will open to control SG level at 50%. When the pressure compensation fails high, the 4A feed reg valve will open to match feed flow with steam flow.

D. Incorrect because when the pressure compensation fails high, the 4A feed reg valve will open to match feed flow with steam flow. Plausible because when the controller is first placed in AUTO, the 4A feed reg valve will open to control SG level at 50%.

Q #62 041K1.06

Unit 4 is in Mode 3.

- The following SDTC conditions exist:
  - Tavg: 544°F
  - Condenser vacuum: 19"Hg
  - Mode Selector Switch: MAN
  - Control Switch: ON

Which ONE of the following correctly describes why the SDTC system operation is blocked and what can be done to arm the system?

The SDTC system is blocked because:

A. Tavg is too low.
Increase Tavg to greater than 545°F.

B. Tavg is too low.
Bypass the low Tavg interlock.

C. Condenser vacuum is too low.
Increase condenser vacuum to greater than 20 "Hg.

D. Condenser vacuum is too low.
Bypass the low condenser vacuum interlock.

NOTE: SDTC: Steam Dump to Condenser
°F: degrees Fahrenheit
"Hg: inches of mercury

Q #62

ANSWER: C

KA: 041K1.06

Knowledge of the physical connection and/or cause-effect relationships between the SDS and the Condenser. 2.6/2.9

10CFR55: 41.7

Reference: 5610-T-L1 Sheet 22A

Cog Level: 1 Recall

Modified from Bank: 69021180612

Response Analysis:

A. Incorrect because Tavg is still above 543°F which is the threshold temperature at which SDTC operation will be blocked. Plausible because the block signal is automatically unblocked when Tavg is raised above the threshold temperature.

B. Incorrect because Tavg is still above 543°F which is the threshold temperature at which SDTC operation will be blocked. Plausible because the block signal may be bypassed by placing the SDTC control switch to bypass, allowing SDTC operation below 543°F.

C. Correct per the reference. The SDTC cannot arm or actuate if vacuum is below 20 "HG. This low vacuum block signal cannot be bypassed.

D. Incorrect because unlike the low Tavg interlock, the low vacuum block cannot be bypassed. Plausible because condenser vacuum is below the 20"HG threshold that blocks SDTC operation.

Q #63 045A2.17

Operators are rolling the Unit 3 turbine to 1800 rpm.

- Turbine speed is approaching 1400 rpm when turbine acceleration increases to 275 rpm/minute.

Which ONE of the following describes the correct operator response?

Lower the:

A. Load Limit controller until acceleration is less than 250 rpm/minute.

B. Governor controller until acceleration is less than 250 rpm/minute.

C. Load Limit controller until acceleration is less than 150 rpm/minute.

D. Governor controller until acceleration is less than 150 rpm/minute.

NOTE: rpm: revolutions per minute

Q #63

ANSWER: A

KA: 045A2.17

Ability to (a) predict the impacts of the following malfunctions or operations on the MT/G system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Malfunction of electrohydraulic control 2.7/2.9

10CFR55: 41.5, 43.5

Reference: 3-OP-089 Steps 5.1.2.16, 5.1.2.17, 5.1.2.19, 5.1.2.20

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the references and discussion above. The operator should lower the Load Limit controller until Turbine acceleration is below 250 rpm/min.

B. Incorrect because the Load Limit is in control, not the governor. Plausible because the operator should lower the controller until Turbine acceleration is below 250 rpm/min.

C. Incorrect because the acceleration limit is 250 rpm/minute, not 150 rpm/minute. Plausible if the operator does not recall the acceleration limit and because the load limit is in control.

D. Incorrect because the Load Limit is in control, not the governor and because the acceleration limit is 250 rpm/minute, not 150 rpm/minute. Plausible if the operator does not recall the acceleration limit and if the operator does not recall that the load limit is in control when turbine speed is 1400 rpm.

Q #64 033A3.02

A leaking fuel element is causing radiation levels in the SFP to increase.

- Chemistry requests the SFP Purification loop be placed in service.

Which one of the following identifies requirements of 4-OP-033, "Spent Fuel Pit Cooling System," regarding the SFP purification loop while in service?

1) Maximum allowable flow through the SFP Demineralizer is _____.

2) Maximum allowable SFP water temperature is _____.

3) A minimum of _____ SFP filter(s) shall be valved in when the SFP purification loop is in service.

A. 1) 100 gpm
   2) 140°F
   3) 2

B. 1) 120 gpm
   2) 140°F
   3) 1

C. 1) 100 gpm
   2) 150°F
   3) 1

D. 1) 120 gpm
   2) 150°F
   3) 2

NOTE: SFP: Spent Fuel Pool
gpm: gallons per minute
°F: degrees Fahrenheit

Q #64

ANSWER: A

KA: 033A3.02

Ability to monitor automatic operation of the Spent Fuel Pool Cooling System including: Spent fuel leak or rupture. 2.5/3.1

10CFR55: 41.7

Reference: 4-OP-033 Steps 5.2.1.2, 5.2.2.4.4, 5.2.2.4.7

Cog Level: 1 Recall

Modified from Bank : 69021410305

Response Analysis:

A. Correct per the reference. Maximum allowable flow through the SFP Demineralizer is 100 gpm. Maximum allowable SFP water temperature is 140°F. A minimum of 2 SFP filter(s) shall be valved in when the SFP purification loop is in service.

B. Incorrect because maximum allowable flow through the SFP Demineralizer is 100 gpm and a minimum of 2 SFP filter(s) shall be valved in when the SFP purification loop is in service. Plausible because maximum allowable SFP water temperature is 140°F.

C. Incorrect because maximum allowable SFP water temperature is 140°F and a minimum of 2 SFP filter(s) shall be valved in when the SFP purification loop is in service. Plausible because maximum allowable flow through the SFP Demineralizer is 100 gpm.

D. Incorrect because maximum allowable flow through the SFP Demineralizer is 100 gpm and maximum allowable SFP water temperature is 140°F. Plausible because a minimum of 2 SFP filter(s) shall be valved in when the SFP purification loop is in service.

Q #65 071K5.04

Operators have just completed the release of a GDT that had both Hydrogen and Oxygen concentrations in excess of 5%.

- Chemistry has resampled the GDT after release and reports the following concentrations:

  Hydrogen: 4.1%
  Oxygen: 2.3%

Which ONE of the following describes the required operator action (if any) and the reason for that action?

The GDT:

A. does NOT have to be released again because both the Hydrogen and Oxygen concentrations are within limits.

B. must be pressurized and released again based on both Hydrogen and Oxygen concentrations.

C. must be pressurized and released again based only on Hydrogen concentration.

D. must be pressurized and released again based only on Oxygen concentration.

NOTE: GDT: Gas Decay Tank

Q #65

ANSWER: B

KA: 071K5.04

Knowledge of the operational implications of the relationship of hydrogen/oxygen concentrations to flammability as they apply to the Waste Gas Disposal system 2.5/3.1

10CFR55: 41.5

Reference: 0-ONOP-061, Step 9 and 6 through 8
TS 3.7.8

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because the GDT has to be re-released based on both Hydrogen and Oxygen concentrations. Plausible because if taken separately, both Hydrogen and Oxygen concentrations are in limits.

B. Correct per the reference and the discussion above. The GDT must be pressurized and released again based on both Hydrogen and Oxygen concentrations.

C. Incorrect because the requirement to re-release the GDT is based on both Hydrogen and Oxygen concentrations. Plausible because the GDT must be re-released and the reason is in part because of the Hydrogen concentration.

D. Incorrect because the requirement to re-release the GDT is based on both Hydrogen and Oxygen concentrations. Plausible because the GDT must be re-released and the reason is in part because of the Oxygen concentration.

Q #66 G2.1.18

The Reactor Operator reports an event that happened on a previous shift that should be entered into the Operations Department Logbook Program (NOMS).

In accordance with 0-ADM-204, "Operations Narrative Logbooks," which ONE of the following describes the correct person and all steps needed to make this entry?

The log entry should be made by the:

A. Reactor Operator.
Enter the date and time the event occurred and then the entry.

B. Reactor Operator.
Enter "Late Entry", followed by the date/time the event occurred and then the entry.

C. Shift Manager.
Enter the date and time the event occurred and then the entry.

D. Shift Manager.
Enter "Late Entry", followed by the date/time the event occurred and then the entry.

Q #66

ANSWER: D

KA: G2.1.18

Ability to make accurate, clear, and concise logs, records, status boards and reports. 3.6/3.8

10CFR55: 41.10

Reference: 0-ADM-204 Step 5.3.4

Cog Level: 1 Recall

Modified from Exam Bank - 69020230101

Response Analysis:

A. Incorrect because ADM-204 directs the SM to make the log entry and because "Late Entry" must be entered, followed by the date and time the event occurred. Plausible because the RO is the operator who discovered the need for the late entry and because the date/time the event occurred and the entry are also required.

B. Incorrect because ADM-204 directs the SM to make the log entry. Plausible because the RO is the operator who discovered the need for the late entry and because "Late entry" and the date/time the event occurred and the entry are also required.

C. Incorrect because "Late Entry" should be entered before the date and time the event occurred is entered. Plausible because ADM-204 directs the SM to make the log entry and because the date/time the event occurred and the entry are also required.

D. Correct per the reference. ADM-204 directs the SM to make the log entry. "Late Entry", the date/time the event occurred and the entry are also required.

Q #67 G.2.1.45

Unit 3 is at 70% power when annunciators associated with steam flow/feed flow mismatch and Steam Generator level deviation occur on all Steam Generators.

- 3A SGFP's red light is on.
- 3B SGFP's green light is on and its amperage has gone to zero.

Which ONE of the following describes control room indications that are consistent with this event?

A. Selected first stage pressure transmitter PT-3-446 has failed low.

B. Containment sump level indication shows a rapid increase in level.

C. 3B Bus Supply breaker, 3AB05, shows green light indication.

D. 3C Bus Supply breaker, 3AC16, shows green light indication.

NOTE: SGFP: Steam Generator Feed Pump

Q #67

ANSWER: D

KA: G.2.1.45

Ability to identify and interpret diverse indications to validate the response of another indication 4.3/4.3
10CFR55: 41.7, 43.5

Reference: 3-ONOP-004.4, Section 2

Cog Level: 2 Comprehension
Level 2 because the operator must evaluate the given conditions and determine which failure would be common to all the conditions. The operator should realize that the green light indication on breaker 3AC16 implies that power is lost to the 3C 4KV Bus. This is the power source to the 3B SGFP. At 70% power, the 3A SGFP cannot maintain S/G level, a turbine runback will occur and all SG levels will decrease. Steam flow will exceed feed flow which will cause the Steam Flow/Feed Flow annunciators to alarm.

New Question

Response Analysis:

A. Incorrect because PT-3-446 failing low will not result in the abnormal SGFP indications. Plausible because PT-446 will result in a SG level transient that will be seen on all SGs simultaneously including the Steam Flow/Feed Flow annunciators.

B. Incorrect because rising containment sump level will not result in the abnormal SGFP indications. Plausible because if the event is a feedline break inside containment it may affect all SGs, the SG with the broken feed line will show rapid level decrease and steam flow/feed flow mismatch and the unaffected SGs may show similar symptoms due to feedwater diverting to the break in the feed line.

C. Incorrect because the de-energizing of 3B 4KV Bus will not result in the abnormal indications given. Plausible because 3B SGFP might be expected to be powered from the 3B 4KV Bus (just like the 3A SGFP is powered from the 3A Bus) In fact at one time the 3B pump was powered from the 3B Bus.

D. Correct because 3C 4KV Bus has de-energized resulting in all of the symptoms given.

Q #68 G.2.2.35

Unit 4 has been cooled down in preparation for refueling.

- RCS Tavg is 135°F.
- Shutdown Margin is 6%.
- Maintenance is preparing to detension the Reactor Vessel head.

Which ONE of the following describes the Tech Spec Operational Mode the unit is presently in?

A. Mode 5 because the Reactor Vessel head has not yet been detensioned.

B. Mode 5 because Tavg is higher than the Mode 6 temperature threshold.

C. Mode 6 because Tavg is lower than the Mode 6 temperature threshold.

D. Mode 6 because Shutdown Margin exceeds 5%.

NOTE: RCS: Reactor Coolant System

Q #68

ANSWER: A

KA: G.2.2.35

Ability to determine Technical Specification Mode of Operation 3.6/4.5

10CFR55: 41.7, 41.10, 43.2

Reference: Tech Spec Table 1.2 Items 5 & 6 and ** footnote

Cognitive Level: 2 Comprehension

Level 2 because the operator has to associate shutdown margin as given in the question with reactivity condition (K_{eff}) as given in the Tech Specs. Tech Specs states that K_{eff} has to be less than or equal to 0.95. The operator has to convert and compare that value to a shutdown margin of 6%.

New Question

Response Analysis:

A. Correct per Tech Spec Table 1.2. The head has not yet been detensioned so Unit 4 is in Mode 5.

B. Incorrect because the Mode 6 temperature threshold is 140°F. Plausible because the Unit is in Mode 5 and Mode definition is also a function of Tavg.

C. Incorrect because Unit 4 is in Mode 5 because the head has not yet been detensioned. Plausible because Tavg is lower than the Mode 6 temperature threshold.

D. Incorrect because the unit is in Mode 5 because the head has not yet been detensioned. Plausible because shutdown margin exceeds 5%.

Q #69 G.2.2.39

Unit 3 is at 90% power.

- The QPTR is 1.11 as a result of misalignment of a control rod.

Which ONE of the following describes the actions required by Tech Specs?

Reduce reactor power to less than or equal to:

A. 57% within 30 minutes.

B. 67% within 30 minutes.

C. 57% within 60 minutes.

D. 67% within 60 minutes.

NOTE: QPTR: Quadrant Power Tilt Ratio

Q #69

ANSWER: B

KA: G.2.2.39

Knowledge of less than or equal to one hour technical specification action statements for systems 3.9/4.5

10CFR55: 41.7, 41.10, 43.2

Reference: Tech Specs 3.2.4 Action b.

Cog Level: 3 Analysis

Level 3 because the operator must recall that with a QPTR > 1.09, power must be reduced within 30 minutes. The operator must also recall that power must be reduced 3% from rated thermal power for each 1% of QPTR in excess of 1.0. Therefore power has to be reduced 33% (3% X 11%) from 100% power. 100% minus 33% equals 67%.

Modified from Exam Bank Question - 69025220301

Response Analysis:

A. Incorrect because power has to be reduced to 67%, not 57%. Plausible because 57% would be the correct answer if the requirement was to reduce power from the present power level (90%) instead of rated thermal power and because the power reduction has to be complete within 30 minutes.

B. Correct per the reference and discussion above. Reduce reactor power to less than or equal to 57% within 30 minutes.

C. Incorrect because power has to be reduced to 67%, not 57% and it has to be done within 30 minutes, not 60 minutes. Plausible because 57% would be the correct answer if the requirement was to reduce power from the present power level (90%) instead of rated thermal power and because 60 minutes is the time frame within the same LCO to recalculate QPTR.

D. Incorrect because power has to be reduced within 30 minutes, not 60 minutes. Plausible because power has to be reduced to less than or equal to 67%.

Q #70 G.2.3.11

Which ONE of the following describes an operational concern associated with initiating a Containment purge on Unit 3?

An uncontrolled radioactive release can occur if the Containment Purge:

A. Exhaust fan is started before the Containment Purge Supply fan.

B. Exhaust fan is started without the Unit 3 equipment hatch, emergency hatch, and at least one personnel door closed.

C. Supply fan is started without the Unit 3 equipment hatch, emergency hatch, and at least one personnel door closed.

D. Exhaust valves, POV-2602 and POV-2603, are opened before the Containment Purge Supply valves, POV-2600 and POV-2601, are opened.

Q #70

ANSWER: C

KA: G.2.3.11

Ability to control radiation releases. 3.8/4.3

10CFR55: 41.11, 43.4

Reference: 0-OP-054 Step 4.13 & Basis

Cog Level: 1 Recall

Direct from NRC Exam - Group 21, 2004

Response Analysis:

A. Incorrect because an Exhaust fan is normally started before the Supply fan. Plausible because when an Exhaust fan is started it will draw air from multiple potentially radioactive sources including the opposite containment, WHT pump discharge vent, instrument air bleed valves, and PASS.

B. Incorrect because starting an Exhaust fan without the Unit 3 equipment hatch, emergency hatch, and at least one personnel door closed will not cause an uncontrolled release. Plausible because this would be true if it was the Supply fan that was started in this manner.

C. Correct per 0-OP-053, Step 4.13 and its basis. An uncontrolled radioactive release can occur if the Containment Purge Supply fan is started without the Unit 3 equipment hatch, emergency hatch, and at least one personnel door closed. The Supply fan would pressurize the containment and force air out any or all these paths and all of these paths are unmonitored.

D. Incorrect because the Exhaust valves are normally opened before the supply valves. Plausible because if the containment is at a positive pressure, air will flow as soon as these valves are opened.

Q #71 G.2.3.11

Operators are performing 3-ONOP-033.2, "Refueling Cavity Seal Failure."

Which ONE of the following describes a hazard that may exist and the actions that will mitigate this hazard?

A. Airborne contamination levels in Containment will increase.
Start at least one Emergency Containment Filter fan.

B. Radiation levels in Containment will increase.
Place the assembly latched on the manipulator into the core and then move the manipulator away from the reactor.

C. Radiation levels in the Spent Fuel Pit may increase.
Move the fuel transfer cart to the containment and close the transfer tube gate valve.

D. Fuel elements in the Spent Fuel Pit Region 1 racks may uncover.
Move the fuel transfer cart to the Spent Fuel Pit and close the transfer tube gate valve.

Q #71

ANSWER: A

KA: G.2.3.11

Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.. 3.4/3.8

10CFR55: 41.12, 43.4

Reference: 3-ONOP-033.2 CAUTION prior to Step 5.1, Step 5.3.6, Step 5.1.3
3-BD-ONOP-033.2 Step 5.3.6

Cog Level: 1 Recall

New Question

Response Analysis:

A. Correct per the reference. Airborne contamination levels in Containment will increase. Start at least one Emergency Containment Filter fan.

B. Incorrect because the fuel element on the manipulator may not be unlatched as implied in the response. Plausible because the operator should place the assembly latched on the manipulator into the core and because radiation levels in containment will increase.

C. Incorrect because the fuel transfer cart must be moved to the Spent Fuel Pit, not the Containment. Plausible because the transfer tube gate valve needs to be closed and radiation levels may increase if the transfer tube gate valve remains open.

D. Incorrect because Fuel elements in the SFP racks will remain covered (by about 2') in the worst case. Plausible because the procedure directs that the transfer cart be moved to the SFP and the gate valve be closed.

Q #72 G.2.3.4

An operator's cumulative documented dose for the year is 0.50 rem.

During a subsequent emergency response, the operator:

- performed actions that decreased the severity of the event and
- received an additional total dose (TEDE) of 4.75 rem.

The operator:

(1) _____ the yearly limit for Occupational Workers.

(2) _____ the Emergency Worker exposure limit.

(3) _____ be allowed to receive more occupational exposure this year.

	(1)	(2)	(3)
A.	did NOT exceed	did NOT exceed	will
B.	did exceed	did NOT exceed	will NOT
C.	did NOT exceed	did exceed	will
D.	did exceed	did exceed	will NOT

NOTE: rem: roentgen equivalent man
TEDE: Total Effective Dose Equivalent

Q #72

ANSWER: B

KA: G.2.3.4

Knowledge of radiation exposure limits under normal or emergency conditions.
3.2/3.7 10CFR55: 41.12, 43.4

Reference: 0-ADM-600 Attachment 1
0-EPIP-20111 Steps 5.1.1.6, 5.1.1.8 and Enclosure 1

Cog Level: 2 Comprehension
Level 2 because the operator must recall the occupational worker limit of 5 rem/year and the emergency worker limit of 25 rem when performing emergency actions that decrease the severity of the event. Additionally an emergency exposure is added to the cumulative documented dose (0.5 rem this case) to determine the new cumulative documented dose after exposure (0.5 rem + 4.75 rem = 5.25 rem). This new total of 5.25 rem exceeds the occupational worker limit of 5 rem/year making this operator ineligible for any additional occupational dose.

New Question

Response Analysis:

A. Incorrect because the operator exceeded the yearly limit for occupational workers and will not be allowed any more occupational exposure. Plausible because the operator did not exceed the emergency worker limit.

B. Correct per the references and the discussion above. The operator exceeded the yearly limit for occupational workers but did not exceed the emergency worker. The operator will NOT be allowed to receive any more occupational exposure this year.

C. Incorrect because the operator did exceed the yearly limit for occupational workers but did not exceed the emergency worker limit. The operator will not be allowed to receive more occupational exposure this year. Plausible because if the operator had not exceed the yearly limit for occupational workers, he would be allowed more occupational exposure.

D. Incorrect because the operator did not exceed the emergency worker limit. Plausible because the operator exceeded the occupational worker limit and will not be allowed any more occupational exposure this year.

Q #73 G.2.4.13

Operators are performing 3-EOP-E-3, "Steam Generator Tube Rupture"

- An RCS cooldown to gain subcooling is in progress.

Which ONE of the following describes actions the RO would be allowed to perform during the cooldown?

The RO would be allowed to establish:

A. maximum charging flow from the running charging pump(s).

B. maximum Pressurizer spray using both Pressurizer Spray valves.

C. RCS pressure less than ruptured SG pressure using one Pressurizer PORV.

D. steam dump to condenser flow rate of 400,000 lbm/hr.

NOTE:

RO:	Reactor Operator
RCS:	Reactor Coolant System
SG:	Steam Generator
PORV:	Power Operated Relief Valve
lbm/hr:	pounds-mass per hour

Q #73

ANSWER: A

KA: G.2.4.13

Knowledge of crew roles and responsibilities during EOP usage. 4.0/4.6

10CFR55: 41.10

Reference: 3-EOP-E-3, Steps 11, 18, 19, 22, 23

Cognitive Level: 2 Comprehension
Level 2 because the operator must realize that E-3 will allow certain actions prior to the completion of the RCS cooldown but others are prohibited until the cooldown is complete. E-3 Step 11 has the BOP initiate the cooldown. While the cooldown is being performed, Step 18 directs the RO to establish maximum charging. Step 19 stops the RO from proceeding until the cooldown is complete. Step 22 directs the RO to depressurize the RCS using pressurizer spray. Step 23 direct the RO to depressurize the RCS using one Pressurizer PORV or Auxiliary spray.

New Question

Response Analysis:

A. Correct because E-3, Step 18 directs the RO to establish maximum charging while the RCS cooldown is being performed.

B. Incorrect because establishing maximum spray is not permitted until the RCS cooldown is complete. Plausible because immediately following completion of the cooldown, Step 22 directs the RO to depressurize the RCS using pressurizer spray.

C. Incorrect because establishing RCS pressure < SG pressure using one PORV is not permitted until the RCS cooldown is complete. Plausible because immediately following completion of the cooldown, Step 23 directs the RO to establish RCS pressure < SG pressure using one pressurizer PORV.

D. Incorrect because the RO is not allowed to increase SDTC flow rate above 350,000 lbm/hr. Plausible because the same procedure step (Step 11.b) also says dump steam at the maximum rate (which previously had no limit on flow rate).

Q #74 G2.4.23

Operators are performing 3-EOP-ES-1.3.

- The Containment Recirculation Sump MOVs are being opened.
- The Shift Technical Advisor reports a Red Path on Core Cooling.

Which ONE of the following describes the correct operator response and the reason?

A. Transition to 3-EOP-FR-C.1.
The core cooling Red Path has priority and occurred because the actions of ES-1.3 were not implemented in a timely manner

B. Transition to 3-EOP-FR-C.1.
The core cooling Red Path FRP has priority and will provide corrective actions that will mitigate the inadequate core cooling condition.

C. Continue to implement ES-1.3.
ES-1.3 actions must be completed before implementing any FRPs, except FR-S.1, because ES-1.3 steps relate to the maintenance of core cooling.

D. Continue to implement ES-1.3.
ES-1.3 actions must be completed before implementing any FRPs because ES-1.3 steps relate to the maintenance of core cooling.

NOTE:

3-EOP-ES-1.3:	"Transfer to Cold Leg Recirculation"
3-EOP-FR-S.1:	"Response to Nuclear Power Generation/ATWS"
3-EOP-FR-C.1:	"Response to Inadequate Core Cooling."
FRPs:	Functional Restoration Procedures
MOVs:	Motor Operated Valves

Q #74

ANSWER: D

KA: G2.4.23

Knowledge of the bases for prioritizing emergency procedure implementation during emergency operations. 3.4/4.4

10CFR55: 41.10, 43.5

Reference: 3-EOP-ES-1.3, NOTE prior to Step 1 and Basis, Step 13, NOTE prior to Step 36

Cog Level: 1 Recall

Modified from Exam Bank - 69023300304

PSA

Response Analysis:

A. Incorrect because operators should continue to implement ES-1.3. Plausible because the Red Path FRP normally has priority over ES procedures and the red path condition may be due to delay in implementation of ES-1.3.

B. Incorrect because operators should continue to implement ES-1.3. Plausible because the core cooling red path FRP does provide corrective actions that will mitigate the ICC condition.

C. Incorrect because operators will not implement any FRPs including FR-S.1. Plausible because ES-1.3 actions relate to the maintenance of core cooling which normally has a lower priority than subcriticality.

D. Correct because operators should continue to implement ES-1.3. ES-1.3 actions must be completed before implementing any FRPs because ES-1.3 steps relate to the maintenance of core cooling.

Q #75 G.2.4.38

An Unusual Event has been declared due to a hurricane approaching Turkey Point.

- The Communicator has contacted the State Warning Point and is ready to relay information.
- Miami-Dade County is on the line.
- The Monroe County contact failed.

Which ONE of the following describes the correct response by the Communicator?

After relaying the Unusual Event information to the state and Miami-Dade County the Communicator should:

A. tell the state representative that the state is responsible for ensuring Monroe County receives the message.

B. call the State Warning Point back subsequently to ensure Monroe County received the message.

C. stay on the line until Monroe County is present to receive the message.

D. perform other Communicator duties. Monroe County does not need to receive this message.

NOTE: NRCOC: Nuclear Regulatory Commission Operations Center

Q #75

ANSWER: B

KA: G.2.4.38

Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. 2.4/4.4

10CFR55: 41.10

Reference: 0-EPIP-20101 NOTE prior to Step 5.6.1.8. c

Cog Level: 1 Recall

New Question

Response Analysis:

A. Incorrect because FPL has the responsibility to contact the counties. Plausible because the state normally initiates contact with the counties.

B. Correct per the reference. The communicator should subsequently follow up with the state or contact Monroe County directly to convey the message.

C. Incorrect because the communicator should subsequently follow up with the state or contact Monroe County directly to convey the message. Plausible because the communicator is responsible to ensure the counties receive the message.

D. Incorrect because the communicator should subsequently follow up with the state or contact Monroe County directly to convey the message. Plausible because Monroe county will already be aware of the approaching hurricane.