ILT39 ONS SRO NRC Examination QUESTION 1

1

D

EPE007 EK3.01 - Reactor Trip

Knowledge of the reasons for the following as the apply to a reactor trip: (CFR 41.5 /41.10 / 45.6 / 45.13)

Actions contained in EOP for reactor trip .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- 1TA and 1TB lockout

Current conditions:

- Reactor power = 1% decreasing
- Group 2 rod 6 position = 58% withdrawn

The EOP directs the operator to __(1)__ AND the reason for this action is to __(2)__.

Which ONE of the following completes the above sentence?

A. 1. GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production)
   2. ensure reactor power is within the heat removal capacity of natural circulation

B. 1. GO TO Rule 1 (ATWS/Unanticipated Nuclear Power Production)
   2. achieve a shutdown margin of at least 1% ΔK/K.

C. 1. Open 1HP-24 and 1HP-25
   2. ensure adequate RCS inventory during the subsequent RCS cooldown

D. 1. Open 1HP-24 and 1HP-25
   2. achieve a shutdown margin of at least 1% ΔK/K.

ILT39 ONS SRO NRC Examination QUESTION 1

1

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. It would be correct if reactor power was above 5% or power was not decreasing,

Second part is incorrect and plausible. Sufficient natural circulation flow would be available to remove up to 5% of rated power if no RCPs were operating

Answer B Discussion

Incorrect.

First part is incorrect and plausible. It would be correct if reactor power was above 5% or power was not decreasing,

Second part is correct. Based upon the given condition the requirement that HPI be initiated for boron injection is to assure adaquate SDM on a stuck control rod.

Answer C Discussion

Incorrect.

First part is correct. The EOP requires HPI for a control rod failing to fully insert.by opening 1HP-24/25.

Second part is incorrect and plausible. If HPI is required for RCS inventory control during an RCS cooldown, then 1HP-24/25 would be opened.

Answer D Discussion

Correct,

First part is correct. The EOP requires HPI for a control rod failing to fully insert.by opening 1HP-24/25.

Second part is correct. Based upon the given condition the requirement that HPI be initiated for boron injection is to assure adaquate SDM on a stuck control rod.

Basis for meeting the KA

The question requires knowledge of the reasons for EOP steps following a reactor trip with a stuck control rod.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-SA R1	

EPE007 EK3.01 - Reactor Trip

Knowledge of the reasons for the following as the apply to a reactor trip: (CFR 41.5 /41.10 / 45.6 / 45.13)

Actions contained in EOP for reactor trip .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION** **1** 1 **D**

ILT39 ONS SRO NRC Examination QUESTION 2

2

A

APE008 AK3.05 - Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open)

Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: (CFR 41.5,41.10 / 45.6 / 45.13)

ECCS termination or throttling criteria .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- BOTH Main FDW Pumps trip

Current conditions:

- PORV has failed open
- ES Channels 1 and 2 have actuated

1) In accordance with Rule 6 (HPI), the MAXIMUM power level at which HPI can be throttled is ___(1)___.

2) The reason power level is used to determine if throttling HPI is appropriate is that it ensures ___(2)___.

Which ONE of the following completes the statements above?

A. 1. 1%
   2. Boron addition continues until power is less than 1%

B. 1. 5%
   2. Boron addition continues until power is less than 5%

C. 1. 1%
   2. sufficient core cooling exists until power level is low enough that HPI Forced cooling can remove the heat

D. 1. 5%
   2. sufficient core cooling exists until power level is low enough that HPI Forced cooling can remove the heat

---

ILT39 ONS SRO NRC Examination QUESTION 2

2

A

General Discussion

Answer A Discussion

Correct.

First part is correct. Per Rule 6 (HPI) with HPI Cooling NOT in progress ALL WR NIs must be less than or equal to 1%.

Second part is correct. Not throttling HPI before power is <1% ensures continued Boron addition which will ensure adequate SDM.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. 5% is the power level used in IMAs to determine if entry into Rule 1 is required.

Second part is correct. Not throttling HPI before power is <1% ensures continued Boron addition which will ensure adequate SDM.

Answer C Discussion

Incorrect.

First part is correct. Per Rule 6 (HPI) with HPI Cooling NOT in progress ALL WR NIs must be less than or equal to 1%.

Second part is incorrect and plausible. HPI is not being used as the source of cooling but reactivity control. The candidate may have a misconception that we do want to get power within the heat removal capability of the HPI system.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. 5% is the power level used in IMAs to determine if entry into Rule 1 is required.

Second part is incorrect and plausible. HPI is not being used as the source of cooling but reactivity control. The candidate may have a misconception that we do want to get power within the heat removal capability of the HPI system.

Basis for meeting the KA

Question requires knowledge of Rule 6 (HPI) and when HPI may be throttled for Pressurizer Vapor Space Accident. The failed open PORV meets the Pressurizer Vapor Space Accident part of the K/A.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

EAP-UNPP R12
EAP-UNPP Attach. 2 (Rule 6)

Student References Provided

APE008 AK3.05 - Pressurizer (PZR) Vapor Space Accident (Relief Valve Stuck Open)
Knowledge of the reasons for the following responses as they apply to the Pressurizer Vapor Space Accident: (CFR 41.5,41.10 / 45.6 / 45.13)
ECCS termination or throttling criteria .....

401-9 Comments:

Remarks/Status

work on second part. SDM does not make sence.

Fixed

ILT39 ONS SRO NRC Examination QUESTION 3

3

A

EPE009 EK1.01 - Small Break LOCA

Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: (CFR 41.8 / 41.10 / 45.3)

Natural circulation and cooling, including reflux boiling .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- SBLOCA
- 1A and 1B SG Levels at the LOSCM setpoint
- TBVs in AUTO and CLOSED

Which ONE of the following combinations of parameters describes the indications that boiler-condenser mode heat transfer has been established?

RCS primary water level is ___(1)___ and SG Pressures will ___(2)___.

A. 1. below the SG secondary water level
   2. increase until the TBV setpoint is reached

B. 1. below the SG secondary water level
   2. decrease until SG pressure stabilizes at Tsat for the RCS temperature

C. 1. above the SG upper tube sheet
   2. increase until the TBV setpoint is reached

D. 1. above the SG upper tube sheet
   2. decrease until SG pressure stabilizes at Tsat for the RCS temperature

---

General Discussion

Answer A Discussion

Correct:

First part is correct. Secondary side SG level must be established at some level above the primary side level to allow condensation of primary side steam and transfer of heat from the RCS to the secondary.

Second part is correct. When BCM is established SG pressure will increase due to the transfer of heat from the RCS to the SGs. The transfer of this heat will cause SG pressure to rise. The first SG pressure control device will be the TBV's that will open when their setpoint is reached. The TBV's will open and maintain SG pressure.

Answer B Discussion

Incorrect:

First part is correct. Secondary side SG level must be established at some level above the primary side level to allow condensation of primary side steam and transfer of heat from the RCS to the secondary.

Second part is incorrect but plausible. Heat transfer to the SG's will cause pressure to rise. For heat to transfer from the RCS to the SG's secondary temperature must be lower than Tsat for the vapor in RCS. It is plausible to assume that BCM of heat transfer can be intermittently lost and restored resulting in the lowering of SG pressure when heat transfer is lost. Once established BCM of heat transfer will not be intermittent. Also once established SG pressure will stabilize at the saturation pressure for the RCS Tcold.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. RCS Primary level will be above the upper tube sheet before transitioning from sustained Two-Phase natural circulation flow towards BCM flow.

Second part is correct. When BCM is established SG pressure will increase due to the transfer of heat from the RCS to the SGs. The transfer of this heat will cause SG pressure to rise. The first SG pressure control device will be the TBV's that will open when their setpoint is reached. The TBV's will open and maintain SG pressure.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. RCS Primary level will be above the upper tube sheet before transitioning from sustained Two-Phase natural circulation flow towards BCM flow.

Second part is incorrect but plausible. Heat transfer to the SG's will cause pressure to rise. For heat to transfer from the RCS to the SG's secondary temperature must be lower than Tsat for the vapor in RCS. It is plausible to assume that BCM of heat transfer can be intermittently lost and restored resulting in the lowering of SG pressure when heat transfer is lost. Once established BCM of heat transfer will not be intermittent. Also once established SG pressure will stabilize at the saturation pressure for the RCS Tcold.

Basis for meeting the KA

Requires knowledge of the plant conditions required for boiler-condenser cooling (reflux boiling) during a SBLOCA.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
TA-AM1 R16	

ILT39 ONS SRO NRC Examination QUESTION 3

3

A

EPE009 EK1.01 - Small Break LOCA

Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: (CFR 41.8 / 41.10 / 45.3)

Natural circulation and cooling, including reflux boiling .....

401-9 Comments:	Remarks/Status

D

ILT39 ONS SRO NRC Examination QUESTION 4

4

EPE011 EK2.02 - Large Break LOCA

Knowledge of the interrelations between the Large Break LOCA and the following: (CFR 41.7 / 45.7)

Pumps .....

Given the following Unit 1 conditions:

- RCS Pressure = 200 psig decreasing
- HPI Flow in 1A Header = 750 gpm
- HPI Flow in 1B Header = 490 gpm

Which ONE of the following describes the required operator actions to protect the HPI pumps?

A. Throttle HPI flows in BOTH 1A & 1B headers to <475 gpm per pump

B. Throttle HPI flow in ONLY 1A header to <750 gpm

C. Throttle HPI flows in BOTH 1A & 1B headers to <950 gpm combined

D. Throttle HPI flow in ONLY 1B header to <475 gpm

ILT39 ONS SRO NRC Examination QUESTION 4

4

D

General Discussion

Answer A Discussion

Incorrect.

Incorrect and plausible. Flow is acceptable in the A header due to 2 pumps operating aligned to that header. B Header flow requires throttling to <475 gpm per Rule 6 since only one pump is aligned. The requirement to throttle exists however the student must know the 475 gpm limit and determine that only the B header flow is too high.

Answer B Discussion

Incorrect.

Incorrect and plausible. 750 gpm is the value of total flow in Rule 6 when operating HPI in piggyback mode with either only one LPI pump running or only one piggyback valve open. The student must determine this number does not apply for the given condition.

Answer C Discussion

Incorrect.

Incorrect and plausible. The 950 gpm flow value in Rule 6 applies only for the side with HPI A & B pumps operating and HP-409 open. The student must determine 3 pumps are operating and this limit does not apply.

Answer D Discussion

Correct:

B header flow is above the 475 flow limit and throttling is required per Rule 6. The student must know the 475 gpm flow limt.

Basis for meeting the KA

Requires knowledge of the relationship between HPI pump status and flow to determine required HPI pump throttling criteria to ensure pump operation within limits and core cooling is maintained. The need for three pumps at near capacity is indicative of a Large Break LOCA.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References	Student References Provided
EOP-Rule 6 (HPI)	

EPE011 EK2.02 - Large Break LOCA

Knowledge of the interrelations between the Large Break LOCA and the following: (CFR 41.7 / 45.7)

Pumps .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 5

5

B

APE015/017 2.1.7 - Reactor Coolant Pump (RCP) Malfunctions

APE015/017 GENERIC

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 80%
- 1A and 1B FDW Masters in HAND
- 1A Feedwater Flow = 4.4 x 10^6 LB/HR
- 1B Feedwater Flow = 4.4 x 10^6 LB/HR

Current conditions:

- 1B1 RCP trips

1) Reactor power must be reduced to a MAXIMUM of __(1)__% CTP.

2) When the MAXIMUM power level is reached, a Main FDW flow of __(2)__ 10^6 LB/HR will be established to the 1A SG?

Which ONE of the following completes the statements above?

A. 1. 65
   2. 5.4

B. 1. 74
   2. 5.4

C. 1. 65
   2. 6.1

D. 1. 74
   2. 6.1

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. Per AP/1 65% is the power level the plant would be limited to for a loss of a Main FDW pump. The student must be able to determine the correct final power level for the given plant condition.

Second part is correct.. With a loss of 1 RCP power must be reduced to less than or equal to 74% CTP. Total FDW flow at this power level is ~8.1 MLB/HR. A Main FDW flow re-ratio will result in 2/3 flow in the loop with two RCPs (A) and 1/3 flow in the loop with the single RCP (B). Total Main FDW flow at 74% will be ~8.14 MLB/HR resulting in ~5.4 MLB/HR in the A loop.

Answer B Discussion

Correct.

First part is correct. The AP requires a plant runback/power reduction to ~74%.

Second part is correct.. With a loss of 1 RCP power must be reduced to less than or equal to 74% CTP. Total FDW flow at this power level is ~8.1 MLB/HR. A Main FDW flow re-ratio will result in 2/3 flow in the loop with two RCPs (A) and 1/3 flow in the loop with the single RCP (B). Total Main FDW flow at 74% will be ~8.14 MLB/HR resulting in ~5.4 MLB/HR in the A loop.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. Per AP/1 65% is the power level the plant would be limited to for a loss of a Main FDW pump. The student must be able to determine the correct final power level for the given plant condition.

Second part is incorrect and plausible. The 6.1 LMB/HR flow rate is the number that is obtained when 8.1 MLB/HR (total Main FDW flow at 74%) is multiplied by .75 (3/4 flow) rather than .666 (2/3 flow). The student may incorrectly assume a 3/4 and 1/4 re-ratio of feedwater.

Answer D Discussion

Incorrect.

First part is correct. The AP requires a plant runback/power reduction to ~74%.

Second part is incorrect and plausible. The 6.1 LMB/HR flow rate is the number that is obtained when 8.1 MLB/HR (total Main FDW flow at 74%) is multiplied by .75 (3/4 flow) rather than .666 (2/3 flow). The student may incorrectly assume a 3/4 and 1/4 re-ratio of feedwater.

Basis for meeting the KA

Question requires evaluating the plant response and operating characteristics and make an operational judgment related to the loss of a RCP. Both expected power level and required loop Main FDW flows must be known and determined.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-APG R8.3, 8.4 AP/1	

APE015/017 2.1.7 - Reactor Coolant Pump (RCP) Malfunctions

APE015/017 GENERIC

Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. (CFR: 41.5 / 43.5 / 45.12 / 45.13)

ILT39 ONS SRO NRC Examination QUESTION 5

5

B

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 6

6

A

APE025 AK1.01 - Loss of Residual Heat Removal System (RHRS)

Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: (CFR 41.8 / 41.10 / 45.3)

Loss of RHRS during all modes of operation .....

Given the following Unit 1 conditions:

Initial conditions:

- 1C LPI Pump is in service providing normal decay heat removal.

Current conditions:

- Loss of offsite power occurs
- Power restored via CT-4
- 1A and 1B LPI Pumps NOT available

Which ONE of the following describes the requirements to start the 1C LPI Pump to restore decay heat removal?

Manual reset of Load Shed is ____(1)____ and starting of 1C LPI Pump is allowed after a MINIMUM of ___(2)___ seconds.

A. 1. NOT required
   2. 5

B. 1. required
   2. 5

C. 1. NOT required
   2. 30

D. 1. required
   2. 30

ILT39 ONS SRO NRC Examination QUESTION 6

6

A

General Discussion

Answer A Discussion

Correct:

First part is correct. Manual reset of load shed is not required because the signal for the 1C LPI Pump is automatically removed.

Second part is correct. "C" LPIP can be started 5 seconds after a load shed condition IF either the "A" or "B" LPIP is OFF.

Answer B Discussion

Incorrect:

First part is incorrect and plausible. Manual reset of load shed is required for many other components (see pg 16 of EL-PSL). The student must know which ones require manual reset and the LPI pumps do not..

Second part is correct. The signal for the 1C LPI Pump is removed 5 seconds after the Load Shed actuated.

Answer C Discussion

Incorrect:

First part is correct. Manual reset of load shed is not required because the signal for the 1C LPI Pump is automatically removed.

Second part incorrect and plausible. 30 seconds is the time the Load Shed operation of X5 and X6 load control centers automatically re-energize. The student must know and understand the difference.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. Manual reset of load shed is required for many other components (see pg 16 of EL-PSL). The student must know which ones require manual reset and the LPI pumps do not..

Second part incorrect and plausible. 30 seconds is the time the Load Shed operation of X5 and X6 load control centers automatically re-energize. The student must know and understand the difference.

Basis for meeting the KA

Requires knowledge of actions required to restore core decay heat removal following a failure of the LPI/DHR Pumps

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
EL-PSL R6	

APE025 AK1.01 - Loss of Residual Heat Removal System (RHRS)

Knowledge of the operational implications of the following concepts as they apply to Loss of Residual Heat Removal System: (CFR 41.8 / 41.10 / 45.3)

Loss of RHRS during all modes of operation .....

401-9 Comments:	Remarks/Status

D

ILT39 ONS SRO NRC Examination QUESTION 7

7

APE027 AK2.03 - Pressurizer Pressure Control System (PZR PCS) Malfunction
Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: (CFR 41.7 / 45.7)
Controllers and positioners .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 90%
- 1B Main Feedwater pump trips

Current conditions:
- Reactor power = 65% and stable
- RCS pressure = 2185 psig and slowly increasing
- Pressurizer level = 220 inches and stable
- Pressurizer temperature = 649.4°F and slowly increasing
- Pressurizer Heater Bank 1 switch is ON
- Pressurizer Heater Bank 2 (Groups B & D) is in AUTO and are ON
- Pressurizer Heater Banks 3 and 4 are in AUTO and off

1) The pressurizer is __(1)__.

2) The pressurizer saturation circuit __(2)__.

Which ONE of the following completes the statements above?

A. 1. subcooled
   2. is responding as expected

B. 1. subcooled
   2. has failed

C. 1. saturated
   2. is responding as expected

D. 1. saturated
   2. has failed

ILT39 ONS SRO NRC Examination QUESTION 7

7

D

General Discussion

This question requires the candidate to determine through calculation that the PZR is in a saturated condition above NOT/NOP. Once saturation condition is determined then it can be concluded with knowledge of the proper operation of the pressurizer saturation circuit that Bank 2 (Groups B & D) should be off. Bank 3 & 4 should be off >2145# and 2175# respectively.

Answer A Discussion

Incorrect:

First part is incorrect plausible. Based on RCS pressure and temperature. Steam tables can be referenced to determine Psat/Tsat relationship and determine the PZR is saturated. A miss use of the steam tables may result in the operator concluding the RCS is subcooled.

Second part is incorrect and plausible. The parameters given are reasonable for the transient runback condition. However bank 2 (Group B & D) should be off when RCS pressure is >2150# and at saturation. The student must diagnose the given plant condition and with the correct understanding of the proper operation of the pressurizer saturation circuit determine it has failed.

Answer B Discussion

Incorrect.

First part is incorrect plausible. Based on RCS pressure and temperature. Steam tables can be referenced to determine Psat/Tsat relationship and determine the PZR is saturated. A miss use of the steam tables may result in the operator concluding the RCS is subcooled.

Second part is correct. The parameters given are reasonable for the transient runback condition. Bank 2 (Group B & D) should be off when RCS pressure is >2150# and at saturation.

Answer C Discussion

Incorrect:

First part is correct. Steam tables can be referenced to determine Psat/Tsat relationship and determine the PZR is saturated.

Second part is incorrect and plausible. The parameters given are reasonable for the transient runback condition. However bank 2 (Group B & D) should be off when RCS pressure is >2150# and at saturation. The student must diagnose the given plant condition and with the correct understanding of the proper operation of the pressurizer saturation circuit determine it has failed.

Answer D Discussion

Correct:

First part is correct. Steam tables can be referenced to determine Psat/Tsat relationship and determine the PZR is saturated.

Second part is correct. The parameters given are reasonable for the transient runback condition. Bank 2 (Group B & D) should be off when RCS pressure is >2150# and at saturation..

Basis for meeting the KA

Requires knowledge of how controllers for Pzr saturation circuit function and the ability to diagnose a malfunction of it. The student must also be able to use steam tables to determine Psat/Tsat relationship in the PZR.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	ONS 2009A RO Q#7 Modified

Development References	Student References Provided
PNS-PZR R5, R29 ONS 2009A RO Q7 Modified	

APE027 AK2.03 - Pressurizer Pressure Control System (PZR PCS) Malfunction

Knowledge of the interrelations between the Pressurizer Pressure Control Malfunctions and the following: (CFR 41.7 / 45.7)

Controllers and positioners .....

ILT39 ONS SRO NRC Examination QUESTION 7

7

D

401-9 Comments:	Remarks/Status
	Fixed Modified…

ILT39 ONS SRO NRC Examination QUESTION 8

8

A

EPE029 EK2.06 - Anticipated Transient Without Scram (ATWS)
Knowledge of the interrelations between the ATWS and the following: (CFR 41.7 / 45.7)
Breakers, relays, and disconnects .....

Given the following Unit 1 conditions:

Initial conditions:
- Time = 0900
- Reactor Power = 100%

Current conditions:
- Time = 0915
- Both Main FDW pumps trip
- Reactor Power = 47% and decreasing
- RCS pressure = 2452 psig increasing
- EFDW flow has been throttled to each SGs at ~990 gpm per header
- SGs indicate 12" XSUR stable

Which ONE of the following actions occurs when Stat Alarms 1SA1/E6 (CRD ELECTRONIC TRIP E) and 1SA1/E7 (CRD ELECTRONIC TRIP F) actuate?

ASSUME NO OPERATOR ACTION

A. Control Rods groups 1-7 will trip and TBVs will control THP pressure at the THP setpoint plus 125 psig

B. Control Rods groups 5-7 ONLY will trip and TBVs will control THP pressure at the THP setpoint plus 125 psig

C. Control Rods groups 1-7 will trip and TBVs will control THP pressure at the THP setpoint.

D. Control Rods groups 5-7 ONLY will trip and TBVs will control THP pressure at the THP setpoint.

ILT39 ONS SRO NRC Examination QUESTION 8

8

A

General Discussion

Answer A Discussion

Correct.

First part is correct. When electronic trip E&F (DSS) occur, CR gps 1-7 insert.

Second part is correct. The TBVs will maintain at THP setpoint + 125 psi. A DSS trip completes a trip confirm signal which adds the 125 psi bias to the TBV setpoint.

Answer B Discussion

Incorrect:.

The first part in incorrect and plausible. This would be correct on an unmodified CRI system ONLY Groups 5 - 7 trip on DSS actuation. This mod was recently completed on all three units.

Second part is correct. The TBVs will maintain at THP setpoint + 125 psi. A DSS trip completes a trip confirm signal which adds the 125 psi bias to the TBV setpoint.

Answer C Discussion

Incorrect.

First part is correct. When electronic trip E&F (DSS) occur, CR gps 1-7 insert.

Second part is incorrect and plausible. Without the DSS signal the Turbine is controlling THP at setpoint.

Answer D Discussion

Incorrect:

The first part in incorrect and plausible. This would be correct on an unmodified CRI system ONLY Groups 5 - 7 trip on DSS actuation. This mod was recently completed on all three units.

Second part is incorrect and plausible. Without the DSS signal the Turbine is controlling THP at setpoint.

Basis for meeting the KA

Tests knowledge of the interrelationship of the RPS breakers and the E&F relays (DSS Trip) to ICS & DSS components during an ATWS

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References

IC-CRI R35

Student References Provided

EPE029 EK2.06 - Anticipated Transient Without Scram (ATWS)
Knowledge of the interrelations between the ATWS and the following: (CFR 41.7 / 45.7)
Breakers, relays, and disconnects .....

401-9 Comments:

Remarks/Status

Add DSS or RCS pressure to stem.
Fixed

ILT39 ONS SRO NRC Examination QUESTION 9

9

A

EPE038 EA1.10 - Steam Generator Tube Rupture (SGTR)
Ability to operate and monitor the following as they apply to a SGTR: (CFR 41.7 / 45.5 / 45.6)
Control room radiation monitoring indicators and alarms .....

Given the following Unit 1 conditions:

- Reactor power = 49% decreasing
- Primary to secondary leakage in 1A SG
- Pzr level = 155 inches and increasing slowly
- ALL HPI Pumps running
- 1HP-26 and 1HP-27 open
- 1HP-5 closed

1) 1RIA-59 & 1RIA-60 __(1)__ be used to determine the SG tube leak rate.

2) The reactor __(2)__ required to be manually tripped.

Which ONE of the following completes the statements above?

A. 1. may
   2. is NOT

B. 1. may
   2. is

C. 1. may NOT
   2. is NOT

D. 1. may NOT
   2. is

General Discussion

This question reqires the RO to evaluate specified plant conditions and conclude that the SG tube leak is within HPI capacity and therefore the EOP does not require the tripping of the reactor. Also the RX power level determines whether 1RIA-59 & 60 can be used to determine RCS leak rate. Since power is given as 49% these rad monitors may be used.

Answer A Discussion

Correct:

First part is correct. 1RIA-59 &-60 (MS Line N-16 gamma detectors) are accurate above 40% power. Below 40% they provide a trend and cannot be used to determine leakrate.

Second part is correct. The SGTR tab directs tripping the reactor for a leak exceeding HPI capacity. Since PZR level is rising the leak is within capacity of HPI and therefore the RX does not need to be tripped. The operator must conclude that with full HPI and a rising PZR level the leak is within HPI capacity.

Answer B Discussion

Incorrect:

First part is correct. 1RIA-59 &-60 (MS Line N-16 gamma detectors) are accurate above 40% power. Below 40% they provide a trend and cannot be used to determine leakrate.

Second part is incorrect and plausible. The SGTR tab directs tripping the reactor for a leak exceeding HPI capacity. 1HP-26 and 1HP-27 are both open when full HPI is injecting. Since PZR level is rising the leak is within capacity of HPI and therefore the RX does not need to be tripped. The operator must conclude that with full HPI and a rising PZR level the leak is within HPI capacity.

Answer C Discussion

Incorrect:

First part is plausible and incorrect. 1RIA-59 &-60 (MS Line N-16 gamma detectors) are only accurate above 40% power. Since power is above 40% they may be used. Below 40% they only provide a trend and can not be used to determine leakrate.

Second part is correct. The SGTR tab directs tripping the reactor for a leak exceeding HPI capacity. Since PZR level is rising the leak is within capacity of HPI and therefore the RX does not need to be tripped. The operator must conclude that with full HPI and a rising PZR level the leak is within HPI capacity.

Answer D Discussion

Incorrect:

First part is plausible and incorrect. 1RIA-59 &-60 (MS Line N-16 gamma detectors) are only accurate above 40% power. Since power is above 40% they may be used. Below 40% they only provide a trend and can not be used to determine leakrate.

Second part is incorrect and plausible. The SGTR tab directs tripping the reactor for a leak exceeding HPI capacity. 1HP-26 and 1HP-27 are both open when full HPI is injecting. Since PZR level is rising the leak is within capacity of HPI and therefore the RX does not need to be tripped. The operator must conclude that with full HPI and a rising PZR level the leak is within HPI capacity.

Basis for meeting the KA

Requires knowledge of the method used to determine RCS leak rate in the SGTR EOP and the method of shutdown used and reason based on power level and leak rate,

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	

Development References	Student References Provided
EAP-SGTR EOP-SGTR	

ILT39 ONS SRO NRC Examination QUESTION 9

9

A

EPE038 EA1.10 - Steam Generator Tube Rupture (SGTR)
Ability to operate and monitor the following as they apply to a SGTR: (CFR 41.7 / 45.5 / 45.6)
Control room radiation monitoring indicators and alarms .....

401-9 Comments:	Remarks/Status
	Possibly make HPI less. (one valve one pump)

ILT39 ONS SRO NRC Examination QUESTION 10

10

B

APE054 AA1.03 - Loss of Main Feedwater (MFW)

Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW):(CFR 41.7 / 45.5 / 45.6)

AFW auxiliaries, including oil cooling water supply .....

Given the following Unit 1 conditions:

- TDEFWP operating
- Main FDW is not available

1) TDEFWP bearing oil cooling is currently provided by __(1)__.

2) If a loss of ALL AC power occurs, TDEFWP bearing oil cooling will be provided by __(2)__.

Which ONE of the following completes the statements above?

A. 1. CCW
   2. LPSW

B. 1. CCW
   2. HPSW

C. 1. RCW
   2. LPSW

D. 1. RCW
   2. HPSW

General Discussion

Answer A Discussion

Incorrect:

The first part is correct. CCW is the normal cooling water supply to the TDEFWP bearing oil.

Second part is incorrect and plausible. LPSW cools various loads in the TB. The student must know and discern LPSW does not cool TDEFWP.

Answer B Discussion

Correct

The first part is correct. CCW is the normal cooling water supply to the TDEFWP bearing oil.

The second part is correct. The CCW pump is an AC pump which is not available on a loss of power. HPSW is the alternate supply and can provide sufficient pressure and flow via the Elevated Water Storage Tank.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. The RCW cools various conponents in the TB. The student must know and discern RCW does not cool TDEFWP.

Second part is incorrect and plausible. LPSW cools various loads in the TB. The student must know and discern LPSW does not cool TDEFWP.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. The RCW cools various conponents in the TB. The student must know and discern RCW does not cool TDEFWP.

The second part is correct. The CCW pump is an AC pump which is not available on a loss of power. HPSW is the alternate supply and can provide sufficient pressure and flow via the Elevated Water Storage Tank.

Basis for meeting the KA

Question requires knowledge of what provides normal bearing cooling water supply to TDEFWP. The second part requires knowledge of the cooling water supply on a loss of all AC power.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	ONS 2009A RO Q#10

Development References

CF-EF R23, R38
ONS 2009A RO Q10

Student References Provided

APE054 AA1.03 - Loss of Main Feedwater (MFW)
Ability to operate and / or monitor the following as they apply to the Loss of Main Feedwater (MFW):(CFR 41.7 / 45.5 / 45.6)
AFW auxiliaries, including oil cooling water supply .....

401-9 Comments:

Remarks/Status

Change second part. Maybe auto or manual.

Fixed

ILT39 ONS SRO NRC Examination **QUESTION 10** 10 **B**

ILT39 ONS SRO NRC Examination QUESTION 11

11

B

EPE055 EA2.06 - Loss of Offsite and Onsite Power (Station Blackout)
Ability to determine or interpret the following as they apply to a Station Blackout : (CFR 43.5 / 45.13)
Faults and lockouts that must be cleared prior to re- energizing buses .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%
- ACB-4 closed
- Switchyard Isolation

Current conditions:
- Keowee Unit 2 emergency lockout
- 230 KV Yellow Bus Differential lockout

1) The MFB will be re-energized from ___(1)___.

2) 230 KV Yellow Bus Differential lockout __(2)__ automatically reset when the fault is removed.

Which ONE of the following completes the statements above?

A. 1. CT-4
   2. will

B. 1. CT-4
   2. will NOT

C. 1. CT-5
   2. will

D. 1. CT-5
   2. will NOT

ILT39 ONS SRO NRC Examination QUESTION 11

11

B

General Discussion

The switchyard isolation will cause Unit 1 to trip due to a load rejection at greater than 70% power. Power would normally be restored via Keoqee Unit 1 via the yellow bus and CT-1. However since CT-1 is lockout it would try to get power from Keowee Unit 2 via the underground and CT-4. With Keowee Unit 2 locked out the operator will have to restore power manually. EOP enclosure 5.38 restore power first from the other Keowee unit via the underground and CT-4.

The 230KV yellow bus lockout must be manually reset in the 230KV relay house. However a 525KV yellow bus lockout would automatically reset when the fault clears.

Answer A Discussion

Incorrect.

The first part is correct. EOP enclosure 5.38 (Restoration of Power) will align power to the MFBs from Keowee Unit 1 via CT-4 since it is operating.

Second part is incorrect and plausible. The 525KV yellow bus lockout would automatically reset when the fault clears.

Answer B Discussion

Correct.

The first part is correct. EOP enclosure 5.38 (Restoration of Power) will align power to the MFBs from Keowee Unit 1 via CT-4 since it is operating.

The second part is correct. The 230KV Bus will not automatically reset when the fault is removed.

Answer C Discussion

Incorrect.

Part one is incorrect and plausable. CT-5 would be used if Keowee Unit 1 were not available this would be correct.

Second part is incorrect and plausible. The 525KV yellow bus lockout would automatically reset when the fault clears.

Answer D Discussion

Incorrect.

Part one is incorrect and plausable. CT-5 would be used if Keowee Unit 1 were not available this would be correct.

The second part is correct. The 230KV Bus will not automatically reset when the fault is removed.

Basis for meeting the KA

The student must diagnose the electrical bus status and know how a 230KV Yellow bus lockout is reset in order to answer this question.

Basis for Hi Cog

Plant conditions and how the electrical system at ONS works must be analyzed along with knowledge of the EOP to determine where the MFBs will be powered from.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-BO R6 EL-EPD R14 EOP Encl. 5.38	

EPE055 EA2.06 - Loss of Offsite and Onsite Power (Station Blackout)
Ability to determine or interpret the following as they apply to a Station Blackout : (CFR 43.5 / 45.13)
Faults and lockouts that must be cleared prior to re- energizing buses .....

ILT39 ONS SRO NRC Examination QUESTION 11

11

B

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 12

12

D

APE056 AK1.01 - Loss of Offsite Power

Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: CFR 41.8 / 41.10 / 45.3)

Principle of cooling by natural convection .....

Given the following Unit 1 conditions:

Initial conditions:

- Time = 0400
- Reactor power = 100%
- Switchyard Isolation

Current conditions:

- Time = 0403
- CETCs = 555°F

1) SG levels will be controlled at ___(1)___.

2) Over the next ten minutes CETCs will ___(2)___ .

Which ONE of the following completes the statement above?

A. 1. 50% OR
   2. stay the same

B. 1. 50% OR
   2. increase

C. 1. 240 inches XSUR
   2. stay the same

D. 1. 240 inches XSUR
   2. increase

General Discussion

The student must recognize that three minutes after a loss of offsite power is not enough time to establish natural circualtion delta T and that EFW will be providing flow to establish the natural circulation setpoint of ~240". Since Tcolds will be determined by SG pressure and relatively constant CETC's must rise in order to create the required delta T for natural circulation.

Answer A Discussion

Incorrect.

The first part is incorrect and plausible. The student must know that a switchyard isolation will result in EFW actuation. If Main FDW is available for SG feed then 50% OR will be the automatic setpoint.

The second part is incorrect and plausible. CETC's will remain relatively constant if RCP's are running. The student must know that a switchyard isolation will result in EFW actuation.

Answer B Discussion

Incorrect.

The first part is incorrect and plausible. The student must know that a switchyard isolation will result in EFW actuation. If Main FDW is available for SG feed then 50% OR will be the automatic setpoint.

The second part is correct.. The student must recognize that three minutes after a loss of offsite power is not enough time to establish natural circualtion delta T and that EFW will be providing flow to establish the natural circulation setpoint of ~240". Since Tcolds will be determined by SG pressure and relatively constant CETC's must rise in order to create the required delta T for natural circulation.

Answer C Discussion

Incorrect.

The first part is correct. The SG level setpoint that EFW will control at is 240" when RCPs are off and SCM is maintained.

The second part is incorrect and plausible. CETC's will remain relatively constant if RCP's are running. The student must know that a switchyard isolation will result in EFW actuation.

Answer D Discussion

Correct.

The first part is correct. The SG level setpoint that EFW will control at is 240" when RCPs are off and SCM is maintained.

The second part is correct.. The student must recognize that three minutes after a loss of offsite power is not enough time to establish natural circualtion delta T and that EFW will be providing flow to establish the natural circulation setpoint of ~240". Since Tcolds will be determined by SG pressure and relatively constant CETC's must rise in order to create the required delta T for natural circulation.

Basis for meeting the KA

The initial condition is a loss of offsite power. The question asks for EFW level setpoints and expected CETC temperature response when in natural circulation cooling.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
TA-AM1 R2, R3	

APE056 AK1.01 - Loss of Offsite Power

Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: CFR 41.8 / 41.10 / 45.3)

Principle of cooling by natural convection .....

ILT39 ONS SRO NRC Examination

QUESTION 12

12

D

401-9 Comments:

Remarks/Status
Modify stem to discuss time frame. Fixed

ILT39 ONS SRO NRC Examination QUESTION 13

13

B

APE058 2.4.11 - Loss of DC Power
APE058 GENERIC
Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1SA-04/E-6 (125 Volt Ground Trouble) actuates

1) 1SA-04/E-6 ARG directs __(1)__ to determine which bus is grounded.

2) 1SA-04/E-6 actuating indicates that the ground is located on __(2)__.

Which ONE of the following completes the statements above?

A. 1. observing the positive or negative Ground Lamps on Panel 1EB6 ONLY
   2. Unit 1 ONLY

B. 1. observing the positive or negative Ground Lamps on Panel 1EB6 ONLY
   2. any Unit

C. 1. rotating the Ground Relay Selector Switch located on Panel 1EB6 and observing if positive or negative Ground Lamps go “bright”
   2. Unit 1 ONLY

D. 1. rotating the Ground Relay Selector Switch located on Panel 1EB6 and observing if positive or negative Ground Lamps go “bright”
   2. any Unit

ILT39 ONS SRO NRC Examination QUESTION 13

13

B

General Discussion

Answer A Discussion

Incorrect.

First part is correct. With a ground present either the positive or negative Ground Lamps will go "bright".

Second part is incorrect and plausible. The alarm test lights are on Unit 1. An operator could reasonably conclude that an alarm is Unit specfic since each unit has a ground trouble Statalarm.

Answer B Discussion

Correct.

First part is correct. With a ground present either the positive or negative Ground Lamps will go "bright".

Second part is correct. There is only one ground detection system. It is shared by all three units. The statalrm cannot be used to determine which unit is affected as all three units are normally cross connected.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. The switch labeling implies this switch is associated with the detection of an alarm. The switch is used for testing the ground lamp circuits and is not manipulated in order for a ground to be detected and alarmed.

Second part is incorrect and plausible. The alarm test lights are on Unit 1. An operator could reasonably conclude that an alarm is Unit specfic since each unit has a ground trouble Statalarm.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. The switch labeling implies this switch is associated with the detection of an alarm. The switch is used for testing the ground lamp circuits and is not manipulated in order for a ground to be detected and alarmed.

Second part is correct. There is only one ground detection system. It is shared by all three units. The statalrm cannot be used to determine which unit is affected as all three units are normally cross connected.

Basis for meeting the KA

Question requires knowledge of actions contained in Alarm Response procedures. These are considered abnormal condition procedures. A DC bus ground is a plausible initiaiting cause for a loss of DC power.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EL-DCD R4 1SA-04/E-6	

APE058 2.4.11 - Loss of DC Power
APE058 GENERIC
Knowledge of abnormal condition procedures. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION 13** 13 **B**

D

ILT39 ONS SRO NRC Examination QUESTION 14 14

APE062 AA2.04 - Loss of Nuclear Service Water

Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: (CFR: 43.5 / 45.13)

The normal values and upper limits for the temperatures of the components cooled by SWS .....

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1LPSW-6 fails closed

Which ONE of the following is the RCP Motor Stator MINIMUM temperature (ºF) that would require immediately tripping the RCP in accordance with AP/16 (Abnormal Reactor Coolant Pump Operation)?

A. 190

B. 225

C. 260

D. 295

ILT39 ONS SRO NRC Examination QUESTION 14

14

D

General Discussion

The RCP Motor stators are cooled by LPSW (our Nuclear Service Water). 1LPSW-6 closing will result in RCP motor stator temperatures increasing to the RCP immediate trip setpoint of 295 degrees.

Answer A Discussion

Incorrect and plausible. This temperature is where the RCP must be immediately tripped for RCP motor bearing temperature.

Answer B Discussion

Incorrect and plausible. This temperature is where the RCP must be immediately tripped for RCP radial bearing temperature.

Answer C Discussion

Incorrect and plausible. This temperature is where the RCP must be immediately tripped for RCP seal return temperature.

Answer D Discussion

Correct. AP/16 (Abnormal RCP Operation) Encl. 5.1 (RCP Immediate Trip Criteria) requires immediately tripping the RCP at a Motor Stator Temperature of 295 degrees.

Basis for meeting the KA

Question requires knowledge of the maximum temperature allowed for the RCP Motor Stator. The stem contains a closure of 1LPSW-6 which results in the loss of SW. The stator is cooled by LPSW.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EAP-APG R9 AP/16 Encl. 5.1	

APE062 AA2.04 - Loss of Nuclear Service Water

Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water: (CFR: 43.5 / 45.13)

The normal values and upper limits for the temperatures of the components cooled by SWS .....

401-9 Comments:	Remarks/Status

C

ILT39 ONS SRO NRC Examination QUESTION 15

15

APE065 AA2.05 - Loss of Instrument Air

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: (CFR: 43.5 / 45.13)

When to commence plant shutdown if instrument air pressure is decreasing

---

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Instrument Air Pressure decreasing
- AP/22 (Loss of Instrument Air) initiated

Current conditions:

- Instrument Air pressure = 61 psig decreasing
- FDW Pump ΔP OAC alarms actuate
- 1A & 1B Main FDW Pump speeds are both increasing

Which ONE of the following describes the actions required by AP/22?

A. Commence a plant shutdown and IAAT two or more CRD temperatures are >180ºF, then trip the reactor.

B. Commence a plant shutdown and IAAT SG level approaches main FDW pump trip criteria, then trip the reactor.

C. Manually trip the reactor and manually trip both main FDW pumps.

D. Manually trip the reactor and take both FDW Masters to Hand and decrease demand to zero.

General Discussion

AP/22 requires the reactor to be tripped when FDW is not controllable. The OAC delta P can be expected at about 30 psig, well below the ~65 psig where FDW valves can stop responding to control signals. Applicants need to know when the OAC alarm actuates. Therefore, the AP requires that the reactor be tripped and the MFDW pumps to be tripped.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The stem provides an IA pressure below which a reactor trip may be required if Main FDW flow cannot be controlled. Since the unit must be taken off line it may be reasonably assumed this can be accomplished with a plant shutdown rather than a manual trip.

Second part is correct. The CRD temperature and corresponding action to trip the reactor is correct for two CRDs >180 degrees.

Answer B Discussion

Incorrect:

First part is incorrect and plausible. The stem provides an IA pressure below which a reactor trip may be required if Main FDW flow cannot be controlled. Since the unit must be taken off line it may be reasonably assumed this can be accomplished with a plant shutdown rather than a manual trip.

Second part is correct. OMP 1-18 dictates a Manual Rx Trip and tripping of both MFWPS if any SG reaches >96% on the OR level.

Answer C Discussion

Correct.

First part is correct. AP/22 requires the reactor to be tripped when FDW is not controllable.

Second part is correct. The OAC FDW pump delta P alarm can be expected at about 30 psig. The FDW flow control valves are assumed to fail "as is" at 65 psig IA pressure. IA pressure is at 61 psig which is well below the ~65 psig where FDW flow control valves will stop responding to control signals. With these indications, FDW flow is assumed to be NOT controllable. Applicants need to know when the OAC alarm actuates. Therefore, the AP requires that the reactor be tripped and the MFDW pumps to be tripped.

Answer D Discussion

Incorrect:

First part is correct. AP/22 requires the reactor to be tripped when FDW is not controllable.

Second part is incorrect and plausible. The candidate could erroneously think that Feedwater control valves (and FDW demand) would still be controllable if taken to Hand on the ICS stations.

Basis for meeting the KA

Question tests knowledge of when to trip the reactor during a loss of IA event. We do not have procedural guidance on when to begin a unit shutdown based on decreasing IA pressure. The only guidance is when to trip the reactor.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References

SSS-IA R44, 53
AP/22
AP/20

Student References Provided

APE065 AA2.05 - Loss of Instrument Air
Ability to determine and interpret the following as they apply to the Loss of Instrument Air: (CFR: 43.5 / 45.13)
When to commence plant shutdown if instrument air pressure is decreasing

ILT39 ONS SRO NRC Examination QUESTION 15

15

C

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 16

16

C

APE077 AA1.05 - Generator Voltage and Electric Grid Disturbances

Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 41.10 / 45.5, 45.7, and 45.8)

Engineered safety features….....

Given the following Unit 1 conditions:

Initial conditions:

- Time = 0400
- Reactor power = 35% stable
- SA-16/C-1 (230 KV Swyd Isolate ES Permit) actuated
- 230 KV Yellow Bus voltage = 224.2 KV increasing

Current conditions:

- Time = 0401
- AP/34 (Degraded Grid) in progress
- 230 KV Yellow Bus voltage = 226.8 KV increasing
- RCS pressure = 1345 psig decreasing
- RB pressure = 2.6 psig increasing

1) At 0401 ES Channels __(1)__ have actuated.

2) At 0402 Unit 1's MFBs will be energized from __(2)__.

Which ONE of the following completes the statements above?

A. 1. 1 and 2 ONLY
   2. CT-1

B. 1. 1 through 6
   2. CT-1

C. 1. 1 and 2 ONLY
   2. CT-4

D. 1. 1 through 6
   2. CT-4

General Discussion

Grid voltage is low and if it stays less than 227,468 for greater than 9 seconds then an ES 1 or 2 actuation on any unit will cause a swyd isolation to occur.

In the current conditions swyd voltage is still low along with low RCS pressure which causes a swyd isolation to occur due to ES 1 and 2 actuation.

A swyd isolation concurrent with a LOCA (LOCA/LOOP) will result in power to the MFBs coming from a Keowee unit via the underground and CT-4.

Answer A Discussion

Incorrect.

First part is correct. ES 1 and 2 have actuated on low RCS pressure of 1600 psig.

Second part is incorrect and plausible. CT-1 would be correct if the LOCA had caused a reactor trip and swyd voltage was NOT low.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. ES channels 1 through 6 will actuate for a RB pressure greater than 3.0 psig.

Second part is incorrect and plausible. CT-1 would be correct if the LOCA had caused a reactor trip and swyd voltage was NOT low.

Answer C Discussion

Correct.

First part is correct. ES 1 and 2 have actuated on low RCS pressure of 1600 psig.

Second part is correct. The degraded swyd voltage concurrent with an ES actuation has caused a swyd isolation. Power will be restored via a Keowee Unit and CT-4.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. ES channels 1 through 6 will actuate for a RB pressure greater than 3.0 psig.

Second part is correct. The degraded swyd voltage concurrent with an ES actuation has caused a swyd isolation. Power will be restored via a Keowee Unit and CT-4.

Basis for meeting the KA

Question requires knowledge of how degraded grid and ES actuation is related and determining the plant response.

Basis for Hi Cog

Analyzing the information given and predicting the plant response is required to answer the question.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
IC-ES R3 EL-EPD R18	

APE077 AA1.05 - Generator Voltage and Electric Grid Disturbances

Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 41.10 / 45.5, 45.7, and 45.8)

Engineered safety features…..

ILT39 ONS SRO NRC Examination QUESTION 16

16

C

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 17

17

C

BWE04 EK3.3 - Inadequate Heat Transfer

Knowledge of the reasons for the following responses as they apply to the (Inadequate Heat Transfer)

(CFR: 41.5 / 41.10, 45.6, 45.13)

Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- 1A and 1B Main FDW pumps tripped
- All EFDW pumps unavailable
- RCS temperature = 581ºF increasing
- Main Steam pressure = 987 psig decreasing
- CBP feed is being established per Rule 3 (Loss of Main/Emergency Feedwater)

1) Initially CBP flow will be controlled to __(1)__.

2) TBVs are throttled to reduce MS pressure __(2)__.

Which ONE of the following completes the statements above?

A. 1. establish 25 inches SU in each SG
   2. to allow CBP flow to enter the SG

B. 1. establish 25 inches SU in each SG
   2. to ensure SG pressure is less than RCS pressure

C. 1. stabilize RCS pressure and temperature
   2. to allow CBP flow to enter the SG

D. 1. stabilize RCS pressure and temperature
   2. to ensure SG pressure is less than RCS pressure

General Discussion

At the given RCS temperature a SG level is not expected to be achieved when on CBP feed. SG pressure must be reduced to below the discharge head of the CBPs. At this low pressure (~550 psi) a SG level and a Psat/Tsat relationship will not be acheivable.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. At the given RCS temperature a SG level is not expected to be achieved when on CBP feed. SG pressure must be reduced to below the discharge head of the CBPs. At this low pressure (~550 psi) a SG level and a Psat/Tsat relationship will not be acheivable. It is plausible because a level of 25 inches would normally be established if using Main FDW.

Second part is correct. SG pressure is reduced to allow CBPs to feed the SGs. CBP discharge pressure is about 550psig. Psat is higher than 550 psi at the given RCS temperature.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. At the given RCS temperature a SG level is not expected to be achieved when on CBP feed. SG pressure must be reduced to below the discharge head of the CBPs. At this low pressure (~550 psi) a SG level and a Psat/Tsat relationship will not be acheivable. It is plausible because a level of 25 inches would normally be established if using Main FDW.

Second part is incorrect and plausible. For SBLOCAs SG pressure is reduced less than RCS pressure to ensure heat transfer is established.

Answer C Discussion

Correct.

First part is correct. Per Rule 3, FDW flow should used to stabilize RCS P/T.

Second part is correct. SG pressure is reduced to allow CBPs to feed the SGs. CBP discharge pressure is about 550psig. Psat is higher than 550 psi at the given RCS temperature.

Answer D Discussion

Incorrect.

First part is correct. Per Rule 3, FDW flow should used to stabilize RCS P/T.

Second part is incorrect and plausible. For SBLOCAs SG pressure is reduced less than RCS pressure to ensure heat transfer is established.

Basis for meeting the KA

Question requires knowledge of how CBP flow is established during a LOHT event by lowering SG pressure to less than CBP dischargeg head. The first part of the question asks the reasons CBP is controlled.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-EOP LOHT Attachment 1 Rule 3	

BWE04 EK3.3 - Inadequate Heat Transfer
Knowledge of the reasons for the following responses as they apply to the (Inadequate Heat Transfer)
(CFR: 41.5 / 41.10, 45.6, 45.13)
Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

ILT39 ONS SRO NRC Examination

QUESTION 17

17

C

401-9 Comments:

Remarks/Status
work Fixed

ILT39 ONS SRO NRC Examination QUESTION 18

18

A

BWE05 2.4.6 - Excessive Heat Transfer
BWE05 GENERIC
Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 1 conditions:

Initial conditions:
- Reactor trips from 100% power due a 1A MSLB
- Tcold decreased to 416ºF
- Core SCM decreased to 0ºF

Current conditions:
- Tcold = 498ºF stable
- Core SCM = 78ºF stable
- Rule 2 (Loss of SCM) is complete
- 1A SG tube leakage = 5 gpm

1) ___(1)___ was the EOP tab that was entered first from Subsequent Actions.

2) Rule 8 (Pressurized Thermal Shock) ___(2)___ required to be invoked.

Which ONE of the following completes the statements above?

A. 1. Loss of SCM
   2. is

B. 1. Loss of SCM
   2. is NOT

C. 1. Excessive Heat Transfer
   2. is

D. 1. Excessive Heat Transfer
   2. is NOT

General Discussion

Answer A Discussion

Correct.

First part is correct. The LOSCM tab will be entered first based upon the order steps are completed in the Subsequent Actions tab. It will determine in the LOSCM tab that SCM was lost due to EHT and then the transfer to EHT tab will be made from the LOSCM tab.

Second part is Correct. Per Rule 8 if "HPI has injected through an open or throttled open 1HP-26, 27, 409, 410 with all RCPs OFF" then Rule 8 would be invoked. Rule 2 has been complete so RCP have been secured and HPI has been initiated.

Answer B Discussion

Incorrect.

First part is correct. The LOSCM tab will be entered first based upon the order steps are completed in the Subsequent Actions tab. It will determine in the LOSCM tab that SCM was lost due to EHT and then the transfer to EHT tab will be made from the LOSCM tab.

Second part is incorrect and plausible. There are two conditions, either of which require Rule 8. If all RCP's are off with HPI on is not understood then a student could conclude Rule 8 is not applicable in that a cooldown below 400 degrees at > 100 degrees per hour has not occurred.

Answer C Discussion

Incorrect.

First part is incorrect and plauible. EHT has occurred as a result of the MSLB on the 1A SG. A student could reasonable conclude EHT is applicable since it is the cause of the LOSM.

Second part is Correct. Per Rule 8 if "HPI has injected through an open or throttled open 1HP-26, 27, 409, 410 with all RCPs OFF" then Rule 8 would be evoked. Rule 2 has been complete so RCP have been secured and HPI has been initiated.

Answer D Discussion

Incorrect.

First part is incorrect and plauible. EHT has occurred as a result of the MSLB on the 1A SG. A student could reasonable conclude EHT is applicable since it is the cause of the LOSM.

Second part is incorrect and plausible. There are two conditions, either of which require Rule 8. If all RCP's are off with HPI on is not understood then a student could conclude Rule 8 is not applicable in that a cooldown below 400 degrees at > 100 degrees per hour has not occurred.

Basis for meeting the KA

The question requires knowledge of the Subsequent Actions tab and the hierarchy of importance to address LOSCM before EHT. The student must determine that PTS limits are invoked in implementing mitigations strategies.

Basis for Hi Cog

Plant data must be evaluated to determine which EOP tab is entered first.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-LOSCM R5 EOP Rule 8	

BWE05 2.4.6 - Excessive Heat Transfer

BWE05 GENERIC

Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

ILT39 ONS SRO NRC Examination

QUESTION 18

18

A

401-9 Comments:

Remarks/Status
SRO????? OPS says votes no on question. Lets validate

APE003 AA2.03 - Dropped Control Rod

Ability to determine and interpret the following as they apply to the Dropped Control Rod: (CFR: 43.5 / 45.13)

Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power =100%
- Computer Reactor Calculation Package NOT running
- FDW Masters in MANUAL
- Reactor Diamond in MANUAL

Current conditions:

- CR Group 3 Rod 4 = 0% withdrawn
- 1NI-5 = 89.3%
- 1NI-6 = 88.6%
- 1NI-7 = 95.9%
- 1NI-8 = 86.8%

1) TS 3.2.3 (QPT) __(1)__ required to be entered.

2) The MINIMUM Core Thermal power at which QPT is required to be monitored in accordance with TS 3.2.3 (QPT) is greater than __(2)__ RTP.

Which ONE of the following completes the statements above?

REFERENCE PROVIDED

A. 1. is
   2. 20%

B. 1. is
   2. 40%

C. 1. is NOT
   2. 20%

D. 1. is NOT
   2. 40%

General Discussion

QPT = 100[power in any Q/Avg pwr of all Q - 1]

AVG power = 90.15

95.9/90.15= 1.0637 - 1 X 100 = 6.38

Answer A Discussion

Correct.

First part is correct. QPT is calculated to be 6.38%. This is above the Out of Core Transient limt for QPT of 5.63% and below the Maximum limit of 14.22%. This requires entry in TS 3.2.3 Condition B.

Second part is correct. Exceeding QPT limits of the COLR requires entry in TS 3.2.3 Condition B. The applicability for this specification is MODE 1 with THERMAL POWER > 20% RTP.

Answer B Discussion

Incorrect.

First part is correct. QPT is calculated to be 6.38%. This is above the Out of Core Transient limt for QPT of 5.63% and below the Maximum limit of 14.22%. This requires entry in TS 3.2.3 Condition B.

Second part is incorrect and plausible. The student must discern between the Imbalance and Tilt power levels. 40% is the correct power level for imbalance.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. If the QPT calculation is performed wrong or the COLR is not interpreted correctly the the student can conclude the TS does not apply.

Second part is correct. Exceeding QPT limits of the COLR requires entry in TS 3.2.3 Condition B. The applicability for this specification is MODE 1 with THERMAL POWER > 20% RTP.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. If the QPT calculation is performed wrong or the COLR is not interpreted correctly the the student can conclude the TS does not apply.

Second part is incorrect and plausible. The student must discern between the Imbalance and Tilt power levels. 40% is the correct power level for imbalance.

Basis for meeting the KA

The question presents the situation where one control rod has dropped to the bottom of the core cause a core power tilt to develop. The student must recognize the improper tilt and calculte the actual out of core tilt. Then the COLR must be porperly applied to conclude a TS entry is required.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

U1 COLR Page 6 of 33
TS 3.2.3
OP/1/A/1105/014 Encl. 4.7

Student References Provided

U1 COLR Page 6 of 33

ILT39 ONS SRO NRC Examination QUESTION 19

19

A

APE003 AA2.03 - Dropped Control Rod

Ability to determine and interpret the following as they apply to the Dropped Control Rod: (CFR: 43.5 / 45.13)

Dropped rod, using in-core/ex-core instrumentation, in-core or loop temperature measurements .....

401-9 Comments:

Remarks/Status
runback to some power. Why runback. Dropped rod or loss of main fdw pump. Maybe use core map. Rods pulling. Discussed with NRC, QPT and TS 20 or 40 % Fixed

ILT39 ONS SRO NRC Examination QUESTION 20

20

C

APE005 AK2.01 - Inoperable/Stuck Control Rod
Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7)
Controllers and positioners .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 68% increasing
- Group 7 Rod 6 = 70% withdrawn and will NOT move

Current conditions:
- Control Rod group 7 average (API) = 78% withdrawn

1) An ICS Asymmetric Rod Runback ___(1)___ occur.

2) ___(2)___ will cause the Diamond to revert to MANUAL.

Which ONE of the following completes the statements above?

A. 1. will
   2. A sequence Fault

B. 1. will
   2. Loss of ICS HAND power

C. 1. will NOT
   2. A sequence Fault

D. 1. will NOT
   2. Loss of ICS HAND power

ILT39 ONS SRO NRC Examination QUESTION 20

20

C

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The student must recognize the affected rod is not on the bottom with an "in Limit" or "0% Limit". If this is overlooked or not known the conclusion of a runback can be reasonably made.

Second part is correct. A sequence fault is a condition that cause the diamond to revert to manual.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The student must recognize the affected rod is not on the bottom with an "in Limit" or "0% Limit". If this is overlooked or not known the conclusion of a runback can be reasonably made.

Second part is incorrect and plausible. A loss of ICS automatic power will revert the diamond to manual.

Answer C Discussion

Correct.

First part is correct. Although an Asymmetric Fault exists (any control rod misaligned > 6.5% from the group average), the Asymmetric Rod Runback will not occur without an "in Limit" or "0% Limit".

Second part is correct. A sequence fault is a condition that cause the diamond to revert to manual.

Answer D Discussion

Incorrect.

First part is correct. Although an Asymmetric Fault exists (any control rod misaligned > 6.5% from the group average), the Asymmetric Rod Runback will not occur without an "in Limit" or "0% Limit".

Second part is incorrect and plausible. A loss of ICS automatic power will revert the diamond to manual.

Basis for meeting the KA

Question requires knowledge of how the CRI system (control rod control system) reacts to a stuck control rod. The candidate must recognize the rod is stuck off of the bottom. Since the rod is not on the bottom the student must know that a runback will not occur and the rod position is still a part of the group calculation. The candidate must understand the relationship between rod position and the sequence fault circuit and their effect on manual/automatic operation.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

IC-CRI R29, 31, 33
STG-ICS R33
AP/1

Student References Provided

APE005 AK2.01 - Inoperable/Stuck Control Rod
Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7)
Controllers and positioners .....

401-9 Comments:

Remarks/Status

JR concern second part. Ok to validate

ILT39 ONS SRO NRC Examination QUESTION 20 20 C

Changed second part.

ILT39 ONS SRO NRC Examination QUESTION 21

21

A

APE028 AK1.01 - Pressurizer (PZR) Level Control Malfunction

Knowledge of the operational implications of the following concepts as they apply to Pressurizer Level Control Malfunctions: (CFR 41.8 / 41.10 / 45.3)

PZR reference leak abnormalities .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- Pzr level channel 3 is selected

Current conditions:

- A break in the Pzr level channel 3 reference leg occurs

1) Pzr level three will indicate __(1)__ than actual level

2) SASS will select Pzr level __(2)__.

Which ONE of the following completes the statements above?

A. 1. higher
   2. one

B. 1. higher
   2. two

C. 1. lower
   2. one

D. 1. lower
   2. two

ILT39 ONS SRO NRC Examination QUESTION 21

21

A

General Discussion

Answer A Discussion

Correct..

First part is correct. A reference leg break creates a lower D/P sensed across the D/P cell, resulting in an indicated level higher than actual level.

Second part is correct. If level channel #3 is selected, then the second SASS input defaults to channel level #1. Level channel #2 is never the second SASS input.

Answer B Discussion

Incorrect.

First part is correct. A reference leg break creates a lower D/P sensed across the D/P cell, resulting in an indicated level higher than actual level.

Second part is incorrect and plausible. Both Pzr level channels 1 and 2 are in ICCM train A. This could be the selected input. If this input fails SASS will select level channel 3. It may be concluded that a failure of level channel 3 can select level channel 2 since it ti a part of the A ICCM train.

Answer C Discussion

Incorrect.

First part is plausible because it would be correct if the reference leg was on the low side of the transmitter.

Second part is correct. If level channel #3 is selected, then the second SASS input defaults to channel level #1. Level channel #2 is never the second SASS input.

Answer D Discussion

Incorrect.

First part is plausible because it would be correct if the reference leg was on the low side of the transmitter.

Second part is incorrect and plausible. Both Pzr level channels 1 and 2 are in ICCM train A. This could be the selected input. If this input fails SASS will select level channel 3. It may be concluded that a failure of level channel 3 can select level channel 2 since it ti a part of the A ICCM train.

Basis for meeting the KA

Question requires knowledge of how the pressurizer level instrument system responds to a reference leg leak and how SASS determines which instrument it will select.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
IC-RCI R1 PNS-PZR R31	

APE028 AK1.01 - Pressurizer (PZR) Level Control Malfunction

Knowledge of the operational implications of the following concepts as they apply to Pressurizer Level Control Malfunctions: (CFR 41.8 / 41.10 / 45.3)

PZR reference leak abnormalities .....

401-9 Comments:	Remarks/Status
	Channel.. What it iscalled

ILT39 ONS SRO NRC Examination QUESTION 21 21 A

fixed

ILT39 ONS SRO NRC Examination QUESTION 22

22

C

APE032 AA1.01 - Loss of Source Range Nuclear Instrumentation

Ability to operate and / or monitor the following as they apply to the Loss of Source Range Nuclear Instrumentation: (CFR 41.7 / 45.5 / 45.6)

Manual restoration of power .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor in MODE 3

Current conditions:

- 1DIB inverter DC Input breaker trips

The associated source range power will be restored using the inverter _____.

Which ONE of the following completes the statement above?

A. ASCO Switch

B. Static Transfer Switch

C. Manual Transfer Switch

D. Inverter Bypass Switches

ILT39 ONS SRO NRC Examination QUESTION 22

22

C

General Discussion

Answer A Discussion

Incorrect and plausible. The ASCO Switch is one method that the Essential inverter output is swapped from the invertor to AC line. (Not Vital Power system inverter)

Answer B Discussion

Incorrect and plausible. The Static Trasnfer Switch is one method that the Essential inverter output is swapped from the invertor to AC line. (Not Vital Power system inverter)

Answer C Discussion

Correct. The manual transfer switch is used to manually swap the Vital Power system from the inverter to AC line.

Answer D Discussion

Incorrect and plausible. The Inverter Bypass Switch is one method that the Essential inverter output is swapped from the invertor to AC line. (Not Vital Power system inverter)

Basis for meeting the KA

Question requires knowledge of how power is restored to the Vital inverters which supply power to the Source Range NIs.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EL-VPC R5 IC-NI	

APE032 AA1.01 - Loss of Source Range Nuclear Instrumentation

Ability to operate and / or monitor the following as they apply to the Loss of Source Range Nuclear Instrumentation: (CFR 41.7 / 45.5 / 45.6)

Manual restoration of power .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 23

23

A

APE076 AK3.06 - High Reactor Coolant Activity

Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity : (CFR 41.5,41.10 / 45.6 / 45.13)

Actions contained in EOP for high reactor coolant activity .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%
- RCS DEI activity = 1.78 µCi/gm
- AP/21 (High Activity in RCS) in progress

Current conditions:

- Reactor power reduction in progress

Which ONE of the following describes the reason AP/21 directs a reduction in the rate power is reduced?

The reduction of the rate is to minimize…

A. additional gap activity entering the RCS.

B. rapid localized power changes due to control rod movement.

C. the time we operate at power with failed fuel.

D. the magnitude of the iodine spike associated with the Rx shutdown.

ILT39 ONS SRO NRC Examination QUESTION 23

23

A

General Discussion

Answer A Discussion

Correct. Per AP/21 a power reduction is required to minimize additional gap activity from entering the RCS.

Answer B Discussion

Incorrect.and plausible. Rapid power changes using control rods will cause local power changes that could cause changes in rod pin internal pressure.

Answer C Discussion

Incorrect.and plausible. Minimizing time that we operate with failed fuel is desirable to minimize the activity of the RCS.

Answer D Discussion

Incorrect.and plausible. Minimizing the magnitude of the iodine spike is why we increase letdown flow following a reactor trip.

Basis for meeting the KA

Oconee does not have any actions in our EOP for high RCS activity. This question is based on an action and the reason for this action contained in AP/21 (High Activity In RCS).

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
CH-RC R10 AP/21	

APE076 AK3.06 - High Reactor Coolant Activity

Knowledge of the reasons for the following responses as they apply to the High Reactor Coolant Activity : (CFR 41.5,41.10 / 45.6 / 45.13)

Actions contained in EOP for high reactor coolant activity .....

401-9 Comments:	Remarks/Status
	B may be true. AP/29 may not be plausible. Power rate Ask JR Submit to NRC. If AP/29 is rejected change to 10%.

ILT39 ONS SRO NRC Examination QUESTION 24

24

A

BWA03 AA1.1 - Loss of NNI-Y

Ability to operate and / or monitor the following as they apply to the (Loss of NNI-Y)
(CFR: 41.7 / 45.5 / 45.6)

Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 25%
- 1FDW-41 (1B Main FDW Control) in MANUAL

Current conditions:
- ICS HAND power lost

1) Assuming no operator action, a 1B SG __(1)__ will occur.

2) If the AUTO pushbutton is depressed on the 1FDW-41 Hand/Auto Station 1FDW-41 will __(2)__.

Which ONE of the following completes the statements above?

A. 1. overfeed
   2. transfer to AUTO.

B. 1. overfeed
   2. remain in MANUAL.

C. 1. underfeed
   2. transfer to AUTO.

D. 1. underfeed
   2. remain in MANUAL.

General Discussion

Answer A Discussion

Correct,

First part is correct. with a loss of ICS Hand power any ICS station in manual will fail to the 50% position. At 25% power a SG overfeed will occur as the 25% power 1B main FDW Control valve demand will be <25%.

Second part is correct. A loss of ICS Hand power does not prevent a transfer to automatic. 1FDW-41 can be placed in AUTO.

Answer B Discussion

Incorrect,

First part is correct. with a loss of ICS Hand power any ICS station in manual will fail to the 50% position. At 25% power a SG overfeed will occur as the 25% power 1B main FDW Control valve demand will be <25%.

Second part is incorrect and plausible. The controller has lost some powe. The student must be aware of the operating characteristic of the ICS control station.

Answer C Discussion

Incorrect.

First part is in correct and plausible. The plant power level is the determining factor whether an overfeed os underfeed will occur. At a higher power level the 1B Main FDW Control valve will move in the closed direction resulting in an underfeed.

Second part is correct. A loss of ICS Hand power does not prevent a transfer to automatic. 1FDW-41 can be placed in AUTO.

Answer D Discussion

Incorrect

First part is in correct and plausible. The plant power level is the determining factor whether an overfeed os underfeed will occur. At a higher power level the 1B Main FDW Control valve will move in the closed direction resulting in an underfeed.

Second part is incorrect and plausible. The controller has lost some powe. The student must be aware of the operating characteristic of the ICS control station.

Basis for meeting the KA

This question requires knowledge of the plant response and the affect on 1FDW-41 to a loss of Hand Power (KU). The student must also be familiar with the expected response of the ICS controlling signal a it relates to valve position and plant power.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References	Student References Provided
STG-ICS R33	

BWA03 AA1.1 - Loss of NNI-Y

Ability to operate and / or monitor the following as they apply to the (Loss of NNI-Y)

(CFR: 41.7 / 45.5 / 45.6)

Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

ILT39 ONS SRO NRC Examination QUESTION 24

24

A

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 25

25

A

BWA05 AK3.1 - Emergency Diesel Actuation

Knowledge of the reasons for the following responses as they apply to the (Emergency Diesel Actuation)
(CFR: 41.5 / 41.10, 45.6, 45.13)

Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%
- ACB-4 closed
- Keowee Unit 1 output = 48 MWe

Current conditions:
- RCS pressure = 1568 psig decreasing

ACB-1 is __(1)__ to __(2)__.

Which ONE of the following completes the statement above?

A. 1. open
   2. ensure Keowee Unit 1 is separated from the 230 KV grid

B. 1. open
   2. ensure Keowee is available to energize Unit 1 MFBs via the underground

C. 1. closed
   2. allow the yellow bus to remain energized in the event a switchyard isolation occurs

D. 1. closed
   2. allow continued Keowee generation to the grid

ILT39 ONS SRO NRC Examination QUESTION 25 25 **A**

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%
- ACB-4 closed
- Keowee Unit 1 output = 48 MWe

Current conditions:
- RCS pressure = 1568 psig decreasing

ACB-1 is __(1)__ to __(2)__.

Which ONE of the following completes the statement above?

A. 1. open
   2. ensure Keowee Unit 1 is separated from the 230 KV grid

B. 1. open
   2. ensure Keowee is available to energize Unit 1 MFBs via the underground

C. 1. closed
   2. allow the yellow bus to remain energized in the event a switchyard isolation occurs

D. 1. closed
   2. allow continued Keowee generation to the grid

ILT39 ONS SRO NRC Examination QUESTION 25

25

A

General Discussion

Keowee Unit 2 is the underground unit which is determined by ACB-4 being closed. If Keowee Unit 1 is operating to the grid and receives an Emergency Start signal, it will separate from the grid by opening ACB-1 and then operate in standby until needed or manually shut down.

Answer A Discussion

Correct.

First part is correct. Since RCS pressure is < 1600 psig, Engineered Safegaurd signals 1 and 2 have actuated which will send an Emergency Start signal to both Keowee Hydro Units.

Second part is correct. Since Keowee unit 1 is operating when the Emergency Start signal is received, it will separate from the 230 KV grid by ACB-1 tripping open and continue to operate in standby.

Answer B Discussion

Incorrect.

First part is correct. Since RCS pressure is < 1600 psig, Engineered Safegaurd signals 1 and 2 have actuated which will send an Emergency Start signal to both Keowee Hydro Units.

Second part is incorrect and plausible. The student may assume or conclude the underground unit to be Keowee Unit 1.In this case, Keowee Unit 2 is the designated underground unit which is determined by ACB-4 being closed.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. The student may incorrectly assume or conclude that an ES Actuation has not occurred or that ES Channel 1 and 2 have no effect on operating Keowee Units.

Second part is incorrect and plausible. The student may assume that the yellow bus is not automatically isolated from the grid when a switchyard isolation occurs.

Answer D Discussion

Incorrect.

First part is icnorrect and plausible. The student may incorrectly assume or conclude that an ES Actuation has not occurred or that ES Channel 1 and 2 have no effect on operating Keowee Units.

Second part is incorrect and plausible. The student may assume the Keowee units can supply generation to the grid.

Basis for meeting the KA

The question asks about emergency operation of the Keowee hydro units which are the Oconee equivalent to an Emergency Diesel and their operating characteristics. The conditions given will result in an ES channel 1&2 actuation on unit 1.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EL-KHG R11, R18	

BWA05 AK3.1 - Emergency Diesel Actuation

Knowledge of the reasons for the following responses as they apply to the (Emergency Diesel Actuation)
(CFR: 41.5 / 41.10, 45.6, 45.13)

Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and
operating limitations and reasons for these operating characteristics.

ILT39 ONS SRO NRC Examination QUESTION 25

25

A

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 26

26

C

BWE03 2.4.45 - Inadequate Subcooling Margin
BWE03 GENERIC
Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%

Current conditions:
- Reactor power = 0.01% decreasing
- 1SA-2/E-2 (HP Loop A Injection Flow HIGH) actuated
- 1SA-18/D-6 (RC System Approaching Saturation Conditions) actuated
- LOOP A SCM = 0°F stable
- LOOP A CORE SCM = 10°F decreasing
- HPI Flow Train A = 604 gpm stable
- HPI Flow Train B = 340 gpm stable

1) Statalarm __(1)__ will require mitigating actions to be taken first.

2) The OAC Core SCM uses the average of the __(2)__ in its calculation.

Which ONE of the following completes the statements above?

A. 1. 1SA-2/E-2
   2. 5 highest of the 24 qualified CETCs

B. 1. 1SA-2/E-2
   2. operable 47 CETCs

C. 1. 1SA-18/D-6
   2. 5 highest of the 24 qualified CETCs

D. 1. 1SA-18/D-6
   2. operable 47 CETCs

General Discussion

Answer A Discussion

Incorrect.

Part one is incorrect and plausible. 1SA-2/E-2 and HPI Train A flow indicate that HPI flow is high in the A loop. TCAs require this flow to be reduced to less than 475 gpm within 10 minutes. However in this case with 2 HPI pumps operating this limit does not apply.

Part two is correct. With reactor power less than 2% the 5 highest of the 24 qualified CETCs are used I nthe SCM calculation.

Answer B Discussion

Incorrect.

Part one is incorrect and plausible. 1SA-2/E-2 and HPI Train A flow indicate that HPI flow is high in the A loop. TCAs require this flow to be reduced to less than 475 gpm within 10 minutes. However in this case with 2 HPI pumps operating this limit does not apply.

Second part is incorrect and plausible. The student must know that the CETCs used for OAC Core SCM calcualtion is dependent upon RX power. 47 operable CETCs would be true if RX power were above 2%,

Answer C Discussion

Correct.

Part one is correct. 1SA-18/D-6 and the SCM meter indicate that SCM has been lost. This requires initiating Rule 2 (Loss of SCM) and the securing of all RCPs within 2 minutes. The TCA for HPI flow exceeding limits is 10 minutes. This makes Rule 2 a higher priority than Rule 6.

Part two is correct. With reactor power less than 2% the 5 highest of the 24 qualified CETCs are used I nthe SCM calculation.

Answer D Discussion

Incorrect.

Part one is correct. 1SA-18/D-6 and the SCM meter indicate that SCM has been lost. This requires initiating Rule 2 (Loss of SCM) and the securing of all RCPs within 2 minutes. The TCA for HPI flow exceeding limits is 10 minutes. This makes Rule 2 a higher priority than Rule 6.

Second part is incorrect and plausible. The student must know that the CETCs used for OAC Core SCM calcualtion is dependent upon RX power. 47 operable CETCs would be true if RX power were above 2%,

Basis for meeting the KA

Question requires knowledge of the relative importance of two Statalarms and recognize that the SCM alarm and condition has a shorter TCA than High HPI flow.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

IC-RCI R41
1SA-18/D-6
EAP-TCA R3, R4
1SA-02/E2

Student References Provided

BWE03 2.4.45 - Inadequate Subcooling Margin
BWE03 GENERIC
Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)

401-9 Comments:

Remarks/Status

D

ILT39 ONS SRO NRC Examination QUESTION 27

27

BWE09 EK1.3 - Natural Circulation Operations

Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Cooldown)

(CFR: 41.8 / 41.10, 45.3)

Annunciators and conditions indicating signals, and remedial actions associated with the (Natural Circulation Cooldown)

Given the following Unit 1 conditions:

Initial conditions:

- Reactor trips from 100% power due to a SBLOCA

Current conditions:

- Rule 2 in progress
- ALL RCPs are secured
- Both Main FDW pumps secured
- 1A and 1B MDEFDW pumps operating
- 1A and 1B EFW flow = 300 gpm stable
- RCS temperature = 468 ºF decreasing
- Core SCM = 0ºF stable
- Calculated C/D rate = 56 ºF/$_{1/2}$ hour

Which ONE of the following describes how the Reactor Operator is required to feed the SGs in accordance with Rule 2 (LOSCM)?

A. Stop EFW flow until TS C/D rates are within limits

B. Maintain 300 gpm per header until the LOSCM set point is reached

C. Increase EFW flow to 450 gpm per header until the LOSCM set point is reached

D. Decrease EFW flow to control C/D rates within TS limits however SG levels must continue to increase to the LOSCM set point

---

ILT39 ONS SRO NRC Examination QUESTION 27

27

D

General Discussion

Answer A Discussion

Incorrect and plausible. The student may recognize that the TS C/D limit is being exceeded and may conclude that EFW is causing the excessive heat transfer. One method of reducing the C/D rate is to stop EFW flow. This is incorrect per the EOP. SG level must continue to increase.

Answer B Discussion

Incorrect and plausible. The student must recognize and determine the TS C/D limits are being exceeded. Otherwise EFW flow is proper for the plant condition. EFW flow is required to be throttled per rule 7 due to the calculated C/D rate is exceeding the TS limit. 300 gpm per header would be correct if C/D rates were not being exceeded.

Answer C Discussion

Incorrect: and plausible. The 450 gpm flow rate is the initial feedwater flow if only one SG is available.

Answer D Discussion

Correct: Rule 7 requires EFW flow to be initially established at 300 gpm per header. C/D limit cannot be exceeded so EFW must be throttled. EFW cannot be throttled below the point where SG level no longer is increasing.

Basis for meeting the KA

Question requires knowledge of procedure (and procedure limits) for natural circ cooldown and reasons for these steps. The student must recognize the TS C/D limit is being exceeded and know the actions necessary to correct this condition.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
EAP-LOSM Att. R7 EOP Rules	

BWE09 EK1.3 - Natural Circulation Operations

Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Cooldown)
(CFR: 41.8 / 41.10, 45.3)

Annunciators and conditions indicating signals, and remedial actions associated with the (Natural Circulation Cooldown)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 28

28

B

SYS003 A4.02 - Reactor Coolant Pump System (RCPS)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
RCP motor parameters .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 65%
- 1LPSW-6 (UNIT 1 RCP COOLERS SUPPLY) fails closed

Current conditions:

- AP/16 (Abnormal RCP Operation) in progress
- RCP Temperatures:

	1A1	1A2	1B1	1B2
Upper Guide Bearing Temp	182ºF	197ºF	188ºF	185ºF
Radial Bearing Temp	219ºF	220ºF	231ºF	222ºF

Which ONE of the following is required per AP/16?

A. Manually trip the Reactor and stop ALL RCPs

B. Manually trip the Reactor and stop RCPs 1A2 & 1B1 ONLY

C. Stop RCP 1A2 ONLY and verify FDW re-ratios properly

D. Stop RCP 1B1 ONLY and verify FDW re-ratios properly

ILT39 ONS SRO NRC Examination QUESTION 28

28

B

General Discussion

Answer A Discussion

Incorrect and plausible. AP/24 (Loss of LPSW) directs tripping the reactor and then tripping all the RCPs. AP/24 is not in progress but is plausible if it is assumed that closing of LPSW-6 caused entry into AP/24.

Answer B Discussion

Correct: AP/16 directs that if any RCP meets immediate trip criteria (Enclosure 5.1) and less than 3 RCPs will be remain, then manually trip the Rx and immediately stop the affected RCPs only. Immediate trip criteria for Upper Guide bearing temp of 190 is exceeded for 1A2 and Radial Bearing temp limit of 225 is exceeded for 1B1.

Answer C Discussion

Incorrect and plausible. Failure to recognize that 1B1 is also above trip criteria for Radial Bearing temp limit of 225 would result in this selection which is directed by AP/16. If only one RCP is tripped below 70% power Rx trip is not required and FDW re-ratio is verified.

Answer D Discussion

Incorrect and plausible. Failure to recognize that 1A2 is also above trip criteria for Upper Guide bearing temp of 190 would result in this selection which is directed by AP/16. If only one RCP is tripped below 70% power Rx trip is not required and FDW re-ratio is verified.

Basis for meeting the KA

Requires the ability to monitor RCP motor parameters and determine that two pumps exceed temperature limits of AP/16. The limits of AP/16 also must be know by the student.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References

AP/16
EAP-APG R8
EAP-APG AP16

Student References Provided

SYS003 A4.02 - Reactor Coolant Pump System (RCPS)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
RCP motor parameters .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 29

29

D

SYS004 A1.07 - Chemical and Volume Control System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: (CFR: 41.5 / 45.5)

Maximum specified letdown flow .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Letdown flow is being increased per chemistry request

1) The letdown high temperature interlock set point is __(1)__.

2) At temperatures greater than the interlock, the demineralizers will __(2)__.

Which ONE of the following completes the statements above?

A. 1. 130°F
   2. remove Boron from the RCS

B. 1. 130°F
   2. release ions and sulfur to the RCS

C. 1. 135°F
   2. remove Boron from the RCS

D. 1. 135°F
   2. release ions and sulfur to the RCS

ILT39 ONS SRO NRC Examination QUESTION 29

29

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The letdown high temperature statalarm set point is 130 degrees the interlock actuates at 135 degrees.

Second part is incorrect and plausible. There is an affect on RCS boron as the temperature of a DI bed changes. Reducing letdown temp will cause the demins to remove Boron from the RCS.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The letdown high temperature statalarm set point is 130 degrees the interlock actuates at 135 degrees.

Second part is correct. Temp. > 135°F will break down the resin in DI beds resulting in a release of various collected ions and sulfur back to the RCS.

Answer C Discussion

Incorrect.

The first part is correct. The letdown high temperature interlock is 135 degrees.

Second part is incorrect and plausible. There is an affect on RCS boron as the temperature of a DI bed changes. Reducing letdown temp will cause the demins to remove Boron from the RCS.

Answer D Discussion

Correct.

The first part is correct. The letdown high temperature interlock is 135 degrees.

Second part is correct. Temp. > 135°F will break down the resin in DI beds resulting in a release of various collected ions and sulfur back to the RCS.

Basis for meeting the KA

Discussed KA with Chief Examiner. Determined that testing on the Letdown High Temperature inerlock would meet the KA since we do not have a maximum specified letdown flow limit.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
PNS-HPI R5, R40	

SYS004 A1.07 - Chemical and Volume Control System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CVCS controls including: (CFR: 41.5 / 45.5)

Maximum specified letdown flow .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION 29** 29 **D**

ILT39 ONS SRO NRC Examination QUESTION 30

30

D

SYS004 K5.37 - Chemical and Volume Control System

Knowledge of the operational implications of the following concepts as they apply to the CVCS: (CFR: 41.5/45.7)

Effects of boron saturation on ion exchanger behavior .....

Given the following Unit 1 conditions:

Initial conditions:

- 230 EFPD
- Spare Purification Demineralizer removed from service after six weeks of continuous operation

Current conditions:

- Reactor power = 70% stable
- Gp 7 Control Rods = 63%
- 394 EFPD
- Spare Purification Demineralizer is placed in service

1) RCS Boron concentration will ___(1)___.

2) Axial Imbalance will initially move in a __(2)__ direction.

Which ONE of the following completes the statements above?

A. 1. decrease
   2. negative

B. 1. decrease
   2. positive

C. 1. increase
   2. negative

D. 1. increase
   2. positive

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The candidate may reasonably conclude that boron concentration will not change based upon when a DI is removed and/or returned to service. The candidate my not recognize the significance of EFPD on boron concentration.

Second part is incorrect and plausible. There are several conditions the candidate must correctly understand. First that an increase in RCS boron will add negative reactivity (not positive) and this addition will cause rods to withdraw (not insert) to compensate. Also the withdrawl of rods will shift imbalance positive (not negative).

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The candidate may reasonably conclude that boron concentration will not change based upon when a DI is removed and/or returned to service. The candidate my not recognize the significance of EFPD on boron concentration.

Second part is correct. The addition of boron to a critical reactor and control rods in automatic would add negative reactivity causing control rods to withdraw to maintain the current power level. As rods withdrew Axial imbalance would initially become more positive.

Answer C Discussion

Incorrect.

First part is correct. When the DI was removed from service RCS Boron concentration was higher since it was earlier in core life than when it was returned to service. Consequently when it was returned to service it would add Boron to the RCS.

Second part is incorrect and plausible. There are several conditions the candidate must correctly understand. First that an increase in RCS boron will add negative reactivity (not positive) and this addition will cause rods to withdraw (not insert) to compensate. Also the withdrawl of rods will shift imbalance positive (not negative).

Answer D Discussion

Correct.

First part is correct. When the DI was removed from service RCS Boron concentration was higher since it was earlier in core life than when it was returned to service. Consequently when it was returned to service it would add Boron to the RCS.

Second part is correct. The addition of boron to a critical reactor would add negative reactivity causing control rods in automatic to withdraw to maintain the current power level. As rods withdrew Axial imbalance would initially become more positive.

Basis for meeting the KA

Question requires a detailed understanding of how a Demin responds when placed in service and not saturated to the current RCS boron concentration as well as the affect on RCS boron and imbalance.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

PNS-HPI R10
CP-018 R1
1103 004

Student References Provided

SYS004 K5.37 - Chemical and Volume Control System
Knowledge of the operational implications of the following concepts as they apply to the CVCS: (CFR: 41.5/45.7)
Effects of boron saturation on ion exchanger behavior .....

ILT39 ONS SRO NRC Examination QUESTION 30

30

D

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 31

31

C

SYS005 K4.01 - Residual Heat Removal System (RHRS)
Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following : (CFR: 41.7)
Overpressure mitigation system .....

Given the following Unit 1 conditions:

- RCS pressure = 550 psig
- An attempt is made to open 1LP-1 (LPI RETURN BLOCK FROM RCS)

1) 1LP-1 __(1)__ open.

2) The reason 1LP-1 has an interlock is to __(2)__.

Which ONE of the following completes the statements above?

A. 1. will
2. prevent over pressurizing LPI suction piping

B. 1. will
2. ensure delta p across 1LP-1 will allow it to open

C. 1. will NOT
2. prevent over pressurizing LPI suction piping

D. 1. will NOT
2. ensure delta p across 1LP-1 will allow it to open

General Discussion

The purpose of the high pressure interlock on the LPI suction valves is to prevent over pressurizing the suction piping. The setpoint for this interlock is 400 psig. So any RCS pressure greater than 400 psig will prevent the opening of the valve.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The 1 LP-1 interlock prevents 1LP-1 from being opened when WR RCS pressure (via the Amphenol connector) is >400 psig. At 550 psig ES would normally have actuated the LPI system on a low RCS pressure. It may be incorrectly assumed that since LPI actuates at 550 psi that it must be OK to open 1LP-1.

Second part is correct. The interlock is designed to prevent over pressurizing LPI suction piping.

Answer B Discussion

Incorrect:

First part is incorrect and plausible. The 1 LP-1 interlock prevents 1LP-1 from being opened when WR RCS pressure (via the Amphenol connector) is >400 psig. At 550 psig ES would normally have actuated the LPI system on a low RCS pressure. It may be incorrectly assumed that since LPI actuates at 550 psi that it must be OK to open 1LP-1.

Second part is incorrect and plausible. Waiting on a lower RCS pressure to open 1LP-1 would in fact lower the dp across 1LP-1 when it is opened. There are many different valves throughout the plant where we take specific actions to ensure dp is low enough across a valve before we try to open it (Ex. MSCV's, FDW valves, etc.).

Answer C Discussion

Correct:

First part is correct. The 1LP-1 interlock prevents 1LP-1 from being opened when WR RCS pressure (via the Amphenol connector) is >400 psig.

Second part is correct. The interlock is designed to prevent over pressurizing LPI suction piping.

Answer D Discussion

Incorrect:

First part is correct. The 1LP-1 interlock prevents 1LP-1 from being opened when WR RCS pressure (via the Amphenol connector) is >400 psig.

Second part is incorrect and plausible. Waiting on a lower RCS pressure to open 1LP-1 would in fact lower the dp across 1LP-1 when it is opened. There are many different valves throughout the plant where we take specific actions to ensure dp is low enough across a valve before we try to open it (Ex. MSCV's, FDW valves, etc.).

Basis for meeting the KA

Requires knowledge of how LPI suction piping overpressure protection is accomplished. This is done by an interlock that prevents placing LPI DHR piping in service prior to being below 400 psi,

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	ONS 2009A RO Q 32 Modified

Development References	Student References Provided
PNS-LPI R16 ONS 2009A RO Q 32 Modified	

SYS005 K4.01 - Residual Heat Removal System (RHRS)

Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following : (CFR: 41.7)

Overpressure mitigation system .....

ILT39 ONS SRO NRC Examination

QUESTION 31

31

C

401-9 Comments:	Remarks/Status
	Question is modified.

ILT39 ONS SRO NRC Examination QUESTION 32

32

A

SYS006 K1.08 - Emergency Core Cooling System (ECCS)

Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

CVCS .....

Given the following Unit 1 conditions:

- Main Steam Line Break has occurred in the RB
- RCS pressure decreased to 1458 psig and is increasing
- RB pressure peaked at 1.3 psig and is decreasing

1) RCS letdown flow ___(1)___ automatically isolated.

2) ___(2)___ Component Cooling pump(s) is/are operating,

Which ONE of the following completes the statements above?

A. 1. has
   2. One

B. 1. has
   2. No

C. 1. has NOT
   2. One

D. 1. has NOT
   2. No

General Discussion

Answer A Discussion

Correct.

First part is correct. ES channels 1 and 2 will actuate at an RCS pressure of 1600 psig. This will cause 1HP-3, 4, 5 to go closed. This will isolate letdown.

Second part is correct. Normally one CC pump is operating. If ES channels 5 or 6 actuated 1CC-7 and/or 1CC-8 would close and this would cause the operating CC pump to trip. Since only ES channels 1 and 2 actuated the running CC will remain running.

Answer B Discussion

Incorrect.

First part is correct. ES channels 1 and 2 will actuate at an RCS pressure of 1600 psig. This will cause 1HP-3, 4, 5 to go closed. This will isolate letdown.

Second part is incorrect and plausible. If ES channels 5 or 6 are incorrectly assumed to have actuated 1CC-7 and/or 1CC-8 would close and this would cause the operating CC pump to trip. Since only ES channels 1 and 2 actuated the running CC pump will remain running. It would be correct if RB pressure had reached 3 psig.

Answer C Discussion

Incorrect..

Part one is incorrect and plausible. The candidate must correctly recognize the correct essential or non essential isolation is required which determines whether RCS letdown will be isolated.

Second part is correct. Normally one CC pump is operating. If ES channels 5 or 6 actuated 1CC-7 and/or 1CC-8 would close and this would cause the operating CC pump to trip. Since only ES channels 1 and 2 actuated the running CC will remain running.

Answer D Discussion

Incorrect.

Part one is incorrect and plausible. The candidate must correctly recognize the correct essential or non essential isolation is required which determines whether RCS letdown will be isolated.

Second part is incorrect and plausible. If ES channels 5 or 6 are incorrectly assumed to have actuated 1CC-7 and/or 1CC-8 would close and this would cause the operating CC pump to trip. Since only ES channels 1 and 2 actuated the running CC pump will remain running. It would be correct if RB pressure had reached 3 psig.

Basis for meeting the KA

Question requires knowledge of how ES actuation affects RCS letdown flow. Specifically the condition that actuates the ES channels and what channels will isolate RCS letdown.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
IC-ES R14, R18 ES Channels 1 and 2 Es Channels 5 and 6	

SYS006 K1.08 - Emergency Core Cooling System (ECCS)

Knowledge of the physical connections and/or cause-effect relationships between the ECCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

ILT39 ONS SRO NRC Examination QUESTION 32

32

A

CVCS .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 33

33

B

SYS007 K4.01 - Pressurizer Relief Tank/Quench Tank System (PRTS)
Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)
Quench tank cooling .....

The Quench Tank (QT) cooler is cooled by __(1)__ and the MINIMUM pressure which will cause the QT rupture disc to rupture is ___(2)___ psig.

Which ONE of the following completes the statement above?

A. 1. Component Cooling Water
2. 49

B. 1. Component Cooling Water
2. 55

C. 1. Low Pressure Service Water
2. 49

D. 1. Low Pressure Service Water
2. 55

ILT39 ONS SRO NRC Examination QUESTION 33

33

B

General Discussion

Answer A Discussion

Incorrect.

First part is correct.

Second part is incorrect and plausible. because 49 psig is the max pressure allowed in the QT by OP/1104/017 (QT Operation) Limits and Precautions..

Answer B Discussion

Correct.

First part is correct. The QT cooler is cooled by Component Cooling

Second part is correct. The QT rupture disk rupturees at 55 psig.

Answer C Discussion

Incorrect.

First part is plausible because LPSW cools various components including some in the RB. Such as RCP motors, RBCUs, and RB Aux Fans.

Second part is incorrect and plausible. because 49 psig is the max pressure allowed in the QT by OP/1104/017 (QT Operation) Limits and Precautions..

Answer D Discussion

Incorrect. First part is plausible because LPSW cools various components including some in the RB. Such as RCP motors, RBCUs, and RB Aux Fans.

Second part is correct.

Basis for meeting the KA

Question requires knowledge about how the QT is cooled.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References

PNS-CS R1, R7
OP/1/A/1104/017

Student References Provided

SYS007 K4.01 - Pressurizer Relief Tank/Quench Tank System (PRTS)
Knowledge of PRTS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)
Quench tank cooling .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 34

34

D

SYS008 A4.07 - Component Cooling Water System (CCWS)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5)
Control of minimum level in the CCWS surge tank .....

Given the following Unit 1 conditions:

Initial conditions:
- Time = 0400
- Makeup to the CC surge tank is desired due to low level

Current conditions:
- Time = 0800
- CC Surge tank level is visibly decreasing

1) At 0400 the makeup source to the CC surge tank is __(1)__ in accordance with OP/1/A/1104/008 (Component Cooling System)

2) At 0800 the CC surge tank is maintained at a level of __(2)__ in accordance with AP/20 (Loss of Component Cooling).

Which ONE of the following completes the statements above?

A. 1. Demin Water ONLY
2. 12 – 35 inches

B. 1. Demin Water ONLY
2. 18 – 30 inches

C. 1. Demin Water or CC Drain Tank
2. 12 – 35 inches

D. 1. Demin Water or CC Drain Tank
2. 18 – 30 inches

ILT39 ONS SRO NRC Examination QUESTION 34

34

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. Demin water is one of the makeup water sources to the CC surge tank. It is also the most commonly used source.

Second part is correct. Per 1SA-09 the CC Surge Tank High/Low level alarm setpoints are 35/12 inches respectively. It is reasonable for the candidate to conclude this is and required level band per AP20.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. Demin water is one of the makeup water sources to the CC surge tank. It is also the most commonly used source.

Second part is correct. AP20 has the operator maintain CC Surge Tank level 18-30".

Answer C Discussion

Correct.

First part is correct. Per OP/1104/008 (CC System) makeup to the CC surge tank can be from DW or the CC drain tank.

Second part is correct. Per 1SA-09 the CC Surge Tank High/Low level alarm setpoints are 35/12 inches respectively. It is reasonable for the candidate to conclude this is and required level band per AP20.

Answer D Discussion

Incorrect.

First part is correct. Per OP/1104/008 (CC System) makeup to the CC surge tank can be from DW or the CC drain tank.

Second part is correct. AP20 has the operator maintain CC Surge Tank level 18-30".

Basis for meeting the KA

Question requires knowledge of the makeup source to the CC surge tank and the minimum level.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References

PNS-CC R8, R9
ARG 1SA-09/D-1
OP/1104/008 (CC System) Encl. 4.8
AP20

Student References Provided

SYS008 A4.07 - Component Cooling Water System (CCWS)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5)
Control of minimum level in the CCWS surge tank .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION 34** 34 **D**

ILT39 ONS SRO NRC Examination QUESTION 35

35

B

SYS008 K1.03 - Component Cooling Water System (CCWS)

Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.9)

PRMS .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- 1RIA-50 in HIGH alarm
- CC Surge Tank Level = 36 inches increasing

Which ONE of the following describes the cause of these indications?

A. CC Cooler leak

B. Letdown cooler leak

C. CRD Stator cooler leak

D. Quench Tank Cooler leak

ILT39 ONS SRO NRC Examination QUESTION 35

35

B

General Discussion

Answer A Discussion

Incorrect and plausible. CC cooler leak would cause in leakage into the CC Surge Tank due to LPSW system pressure being greater than CC system pressure. However LPSW leakage into the CC system would not cause an RIA-50 alarm.

Answer B Discussion

Correct. A leak in a letdown cooler would cause in leakage to the CC system due to RCS pressure being greater than CC system pressure and RIA-50 would alarm due to the RC activity.

Answer C Discussion

Incorrect and plausible. CC cools the CRD stators. They are not part of the RCS pressure boundary. The candidates may choose this answer if they do not understand how CC is used in the CRD mechanism.

Answer D Discussion

Incorrect and plausible. A QT cooler leak would not cause RIA-50 to alarm. During normal operation as the CC system is at a higher pressure. This would cause CC water to flow into the QT causing its level to increase and CC surge tank level to decrease.

Basis for meeting the KA

Question requires knowledge of what would cause inleakage into the CC system and would cause a Process Radiation Monitor alarm.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
PNS-CC R5 OP/1/A/1104/008	

SYS008 K1.03 - Component Cooling Water System (CCWS)

Knowledge of the physical connections and/or cause-effect relationships between the CCWS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.9)

PRMS .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 36

36

B

SYS010 K2.03 - Pressurizer Pressure Control System (PZR PCS)
Knowledge of bus power supplies to the following: (CFR: 41.7)
Indicator for PORV position .....

1RC-66 (PORV) pilot valve and pilot valve position indication is powered from which ONE of the following?

A. 1DIA

B. 1DIB

C. 1KI

D. 1KU

ILT39 ONS SRO NRC Examination QUESTION 36

36

B

General Discussion

Answer A Discussion

Incorrect and plausible. 1DIA panelboard is another similar vital DC bus.

Answer B Discussion

Correct. 1RC-66 pilot valve is powered from DIB panelboard breaker #24.

Answer C Discussion

Incorrect and plausible. 1KI AC panelboard supplies primary control power for automatic operation of 1RC-66.

Answer D Discussion

Incorrect and plausible. 1KU AC panelboard supplies backup control power for 1RC-66.

Basis for meeting the KA

Question requires knowledge of the bus normal power supplies for the PORV pilot valve.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
PNS-PZR R30	

SYS010 K2.03 - Pressurizer Pressure Control System (PZR PCS)
Knowledge of bus power supplies to the following: (CFR: 41.7)
Indicator for PORV position .....

401-9 Comments:	Remarks/Status

D

ILT39 ONS SRO NRC Examination QUESTION 37

37

SYS012 K3.02 - Reactor Protection System (RPS)
Knowledge of the effect that a loss or malfunction of the RPS will have on the following : (CFR: 41.7 / 45.6)
T/G .....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 60% stable
- 1A Main FDW pump operating
- 1A and 1B FDW Masters in MANUAL
- Condenser vacuum has decreased to 22" Hg and is now slowly increasing
- The reactor trip push button is depressed in accordance with AP/27 (Loss of Condenser Vacuum)

Current conditions:

- Reactor power = 23% decreasing
- ALL CRD Breakers CLOSED

1) The Main Turbine __(1)__ automatically tripped due to the Reactor Trip Confirm signal.

2) At this time the EOP will direct __(2)__.

Which ONE of the following completes the statements above?

A. 1. has
2. maximizing letdown flow

B. 1. has
2. adjusting FDW flow to control RCS temperature

C. 1. has NOT
2. a manual Main Turbine trip

D. 1. has NOT
2. adjusting FDW flow to control RCS temperature

ILT39 ONS SRO NRC Examination QUESTION 37

37

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The student can reasonably conclude the trubine would trip when the RX Manual Trip pushbutton is depressed. Also if vacuum had decreased to 21.75 inches the trubine should have automatically tripped on low vacuum.

Second part is correct. Per the UNPP tab maximizing letdown is directed is step 9 which performed if NI power is >5%.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The student can reasonably conclude the trubine would trip when the RX Manual Trip pushbutton is depressed. Also if vacuum had decreased to 21.75 inches the trubine should have automatically tripped on low vacuum.

Second part is correct. The candidate will determine that Main FDW is operating and in manual . The EOP will require FDW flow be adjusted to control RCS temperature.

Answer C Discussion

Incorrect.

First part is correct. The Main Turbine will NOT have tripped because a Reactor Trip Confirm (RTC) signal is NOT present. RTC is generated by the CRD breakers or a DSS signal. DSS would actuate at an RCS pressure of 2450 psig. Since FDW and the MT are operating RCS pressure would not spike up.

Second part is incorrect and plausible. Per the UNPP tab tripping the Main Turbine is performed only if both Main FDW pumps are tripped or Nis indicate <5%. The candidate may inappropriately conclude that whenever the RX trip pushbutton is pushed the Turbine trip pushbutton should also be pushed which is true in all cases where the RX actually trips.

Answer D Discussion

Correct.

First part is correct. The Main Turbine will NOT have tripped because a Reactor Trip Confirm (RTC) signal is NOT present. RTC is generated by the CRD breakers or a DSS signal. DSS would actuate at an RCS pressure of 2450 psig. Since FDW and the MT are operating RCS pressure would not spike up.

Second part is correct. The candidate will determine that Main FDW is operating and in manual . The EOP will require FDW flow be adjusted to control RCS temperature.

Basis for meeting the KA

Question requires knowledge of how the turbine will automatically trip based upon the operation of the RPS system.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

STG-EHC R23
IC-RPS R3
IC-CRI R35
AP/27 (Loss of Condenser Vacuum)
EAP-UNPP R10
EOP UNPP Tab

Student References Provided

ILT39 ONS SRO NRC Examination QUESTION 37

37

D

SYS012 K3.02 - Reactor Protection System (RPS)

Knowledge of the effect that a loss or malfunction of the RPS will have on the following : (CFR: 41.7 / 45.6)

T/G .....

401-9 Comments:	Remarks/Status

D

ILT39 ONS SRO NRC Examination QUESTION 38

38

SYS013 K6.01 - Engineered Safety Features Actuation System (ESFAS)
Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: (CFR: 41.7 / 45.5 to 45.8)
Sensors and detectors .....

Given the following Unit 3 conditions:

- Reactor power = 100%
- 3KVIB AC Vital Power Panelboard supply breaker trips OPEN
- ES Analog Channel "C" WR RCS pressure signal fails LOW

Which ONE of the following describes which (if any) ES digital channels have actuated?

_____ have actuated.

A. NO channels

B. Channels 1 thru 4

C. ONLY channels 2 AND 4

D. ONLY channels 1 AND 3

ILT39 ONS SRO NRC Examination QUESTION 38

38

D

General Discussion

Answer A Discussion

Incorrect and plausible. There is a loss of power to an analog channel. The digital channels fail in the untripped state when they lose power but the analog channels fail tripped when they lose power. Since KVIB is a supply to both the B analog and the Even digitals, it would be plausible to determine the B analog channel does not trip therefore no digital channels would actuate.

Answer B Discussion

Incorrect and plausible. There are 2 analog channels tripped on RCS pressure and therefore this would be correct if there were no loss of power to the Even digital channels.

Answer C Discussion

Incorrect and plausible. There are 2 analog channels tripped on RCS pressure and therefore this would be correct if there were no loss of power to the Even digital channels.This would be correct if KVIA supplied the Even digitial channels instead of the Odd channels.

Answer D Discussion

Correct: The digital channels fail in the untripped state when they lose power but the analog channels fail tripped when they lose power. Since KVIB is a supply to both the B analog and the Even digitals, there would be 2 Analog channels tripped on the RCS pressure parameter therefore a trip signal is sent to Digital channels 1-4. With the Even Digital channels without power, only channels 1 and 3 would actuate.

Basis for meeting the KA

Requires knowledge of the effect of both a loss of power to a channels sensors/detectors as well as a malfunction of a sensor/detector will have on ESFAS actuation

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	ONS 2009A RO Q#40

Development References	Student References Provided
IC-ES R2, R5, R12 ONS 2009A RO Q#40	

SYS013 K6.01 - Engineered Safety Features Actuation System (ESFAS)

Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: (CFR: 41.7 / 45.5 to 45.8)

Sensors and detectors .....

401-9 Comments:	Remarks/Status

C

ILT39 ONS SRO NRC Examination QUESTION 39

39

SYS022 K2.01 - Containment Cooling System (CCS)
Knowledge of power supplies to the following: (CFR: 41.7)
Containment cooling fans .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 50%

Current conditions:
- LBLOCA occurs
- 1TC de-energized

Which ONE of the following describes the status of the below listed Reactor Building Cooling Units five (5) minutes after ES actuates?

ASSUME NO OPERATOR ACTIONS

	1A RBCU	1B RBCU
A.	LOW	LOW
B.	LOW	OFF
C.	OFF	LOW
D.	OFF	OFF

ILT39 ONS SRO NRC Examination QUESTION 39

39

C

General Discussion

Answer A Discussion

Incorrect and plausible. The RBCU power supplies are not sequenced such that the letter designator follows the power supply arrangement. If 1C RBCU fan is applied to TC bus this choice would be plausible.

Answer B Discussion

Incorrect and plausible. The candidate can confuse the typical power supply arrangement where TC supplies "B" safety train components and TE supplies "C" safety train components.

Answer C Discussion

Correct: 1TD supplies 1X9 which supplies 1C RBCU. 1TE supplies 1XS3 which supplies 1B RBCU. 1TC supplies 1XS8 which supplies 1A RBCU. ES will starts all three RBCUs. Since the 'A' fan does not have any power it will not start. The RBCU will start after a 3 minute time delay.

Answer D Discussion

Incorrect and plausible. There is a time delay on the restart of the RBCUs. Incorrect application of the time delay or lack of understanding of the ES control of the RBCUs could result in selecting this distracter.

Basis for meeting the KA

Requires knowledge of power supplies to Reactor Building Cooling Units (RBCUs)

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References

PNS-RBC R1, 14, 15

Student References Provided

SYS022 K2.01 - Containment Cooling System (CCS)
Knowledge of power supplies to the following: (CFR: 41.7)
Containment cooling fans .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 40

40

A

SYS026 A2.08 - Containment Spray System (CSS)

Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Safe securing of containment spray when it can be done) .....

Given the following Unit 1 conditions:

Initial conditions:

- LOCA occurs while operating at 100% power
- ES 1-8 actuates

Current conditions:

- LOCA CD tab in progress
- Reactor Engineering confirms Condition Zero per RP/0/B/1000/018 (Core Damage Assessment)

1) The MAXIMUM RB pressure for securing the RBS pumps is ___(1)___.

2) The time requirement since the event for securing the RBS pumps is __(2)__.

Which ONE of the following completes the statements above?

A. 1. < 3 psig
   2. < 24 hours

B. 1. < 3 psig
   2. > 24 hours

C. 1. < 10 psig
   2. < 24 hours

D. 1. < 10 psig
   2. > 24 hours

ILT39 ONS SRO NRC Examination QUESTION 40

40

A

General Discussion

Answer A Discussion

Correct.

First part is correct. Per LOCA CD tab of the EOP RB pressure must be < 3 psig in order to secure RBS.

Second part is correct. Per LOCA CD Tab RBS should be secured within < 24 of the event.

Answer B Discussion

Incorrect and plausible.

First part is correct. Per LOCA CD tab of the EOP RB pressure must be < 3 psig in order to secure RBS.

Second part is incorrect and plausible. The 24 hour time is correct. It is reasonable to conclude that a greater time period would be better and so > 24 hours would be required.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. The actuation setpoint for RBS is RB pressusre of 10 psig. It makes sence that at less than the actuation setpoint you could secure the system.

Second part is correct. Per LOCA CD Tab RBS should be secured within < 24 of the event.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. The actuation setpoint for RBS is RB pressusre of 10 psig. It makes sence that at less than the actuation setpoint you could secure the system.

Second part is incorrect and plausible. The 24 hour time is correct. It is reasonable to conclude that a greater time period would be better and so > 24 hours would be required.

Basis for meeting the KA

Question requires knowledge of EOP guidance and specific time and RB pressure for securing the RBS pumps following ES actuation.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References

EAP-LCD R8
EOP LOCA CD Tab

Student References Provided

SYS026 A2.08 - Containment Spray System (CSS)
Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)
Safe securing of containment spray when it can be done) .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 40

40

A

ILT39 ONS SRO NRC Examination QUESTION 41

41

D

SYS026 K3.01 - Containment Spray System (CSS)
Knowledge of the effect that a loss or malfunction of the CSS will have on the following: (CFR: 41.7 / 45.6)
CCS .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%

Current conditions:
- LBLOCA in progress
- 1TD de-energized
- 1XS4 de-energized

1) The Reactor Building Cooling system __(1)__ perform its safety function.

2) Tri-sodium Phosphate is added to water in containment to __(2)__.

Which ONE of the following completes the statements above?

A. 1. will
   2. minimize hydrogen production due to the Zirc-water reaction

B. 1. will
   2. maintain Iodine in solution to minimize dose in the RB atmosphere

C. 1. will NOT
   2. minimize hydrogen production due to the Zirc-water reaction

D. 1. will NOT
   2. maintain Iodine in solution to minimize dose in the RB atmosphere

---

ILT39 ONS SRO NRC Examination QUESTION 41

41

D

General Discussion

Answer A Discussion

Incorrect.

Part 1 is incorrect and plausible. The candidate must know that 1XS4 will make the "A" train inoperable. Even if the power supply is known he must also know that 1BS-1 is normally closed. The RBS pump suction valves are normally open. It is reasonable to conclude that one train is operable and therefore RX Bldg Cooling function is maintained.

Second part is incorrect and plausible. The caustic does reduce Hydrogen production but it is from the Zinc and aluminum reaction.

Answer B Discussion

Incorrect.

Part 1 is incorrect and plausible. The candidate must know that 1XS4 will make the "A" train inoperable. Even if the power supply is known he must also know that 1BS-1 is normally closed. The RBS pump suction valves are normally open. It is reasonable to conclude that one train is operable and therefore RX Bldg Cooling function is maintained.

Second part is correct. One reason Caustic is added is to maintain Iodine in solution to minimize dose from iodine in the RB atmosphere.

Answer C Discussion

Incorrect.

First part is correct. 1TD supplies power to the 1B RBS pump and 1XS4 powers 1BS-1 (normally closed). This will make both trains of RBS inoperable and the Containment Cooling system will NOT perform its safety function.

Second part is incorrect and plausible. The caustic does reduce Hydrogen production but it is from the Zinc and aluminum reaction.

Answer D Discussion

Correct.

First part is correct. 1TD supplies power to the 1B RBS pump and 1XS4 powers 1BS-1 (normally closed). This will make both trains of RBS inoperable and the Containment Cooling system will NOT perform its safety function.

Second part is correct. One reason Caustic is added is to maintain Iodine in solution to minimize dose from iodine in the RB atmosphere.

Basis for meeting the KA

Question requires knowledge of the affect of a loss of both trains of RBS and its affect on the containment cooling system following a LBLOCA.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
PNS-BS R16 IC-ES R20	

SYS026 K3.01 - Containment Spray System (CSS)

Knowledge of the effect that a loss or malfunction of the CSS will have on the following: (CFR: 41.7 / 45.6)

CCS .....

401-9 Comments:	Remarks/Status
	.

ILT39 ONS SRO NRC Examination QUESTION 41

41

D

ILT39 ONS SRO NRC Examination QUESTION 42

42

B

SYS039 A3.02 - Main and Reheat Steam System (MRSS)
Ability to monitor automatic operation of the MRSS, including : (CFR: 41.5 / 45.5)
Isolation of the MRSS .....

Given the following Unit 3 conditions:

Initial conditions:
- Reactor power = 100%
- 3MS-112 & 3MS-173 (SSRH 3A/3B Controls) are OPEN in MANUAL
- 3MS-77, 78, 80, 81 (MS to SSRH's) control switches in OPEN

Current conditions:
- Main Turbine trips

1) 3MS-112 & 3MS-173 will __(1)__.

2) 3MS-77, 78, 80, 81 will __(2)__.

Which ONE of the following completes the statements above?

A. 1. close
   2. close

B. 1. close
   2. remain open

C. 1. remain open
   2. close

D. 1. remain open
   2. remain open

ILT39 ONS SRO NRC Examination QUESTION 42

42

B

General Discussion

Answer A Discussion

Incorrect.

First part is correct. 3MS-112/173 will close whether their control switch is in auto or manual when the reactor trips.

Second part is incorrect and plausible. That fact that 3MS-112/173 will close whether their control switch is in auto or manual when the reactor trips makes it reasonable and plausible the 3MS-77, 78, 80, 81 will close also.

Answer B Discussion

Correct.

First part is correct. 3MS-112/173 will close whether their control switch is in auto or manual when the reactor trips.

Second part is correct. MS-77/78/80/81 will remain open if their control switches are in open when the reactor trips.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. The misconception that a valve should remain in its current position even on a reactor trip is reasonable. That fact that 3MS-77, 78, 80, 81 will remain open when the reactor trips with their control switch in open makes it reasonable and plausible that 3MS-112 / 173 will remain open.

Second part is incorrect and plausible. That fact that 3MS-112/173 will close whether their control switch is in auto or manual when the reactor trips makes it reasonable and plausible the 3MS-77, 78, 80, 81 will close also.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. The misconception that a valve should remain in its current position even on a reactor trip is reasonable. That fact that 3MS-77, 78, 80, 81 will remain open when the reactor trips with their control switch in open makes it reasonable and plausible that 3MS-112 / 173 will remain open.

Second part is correct. MS-77/78/80/81 will remain open if their control switches are in open when the reactor trips.

Basis for meeting the KA

Question requires knowledge of how the MSRs are isolated following a turbine trip. The candidate must distinquish between two different operating characteristics of valves for the SSRH's.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
STG-MSR R18	

SYS039 A3.02 - Main and Reheat Steam System (MRSS)
Ability to monitor automatic operation of the MRSS, including : (CFR: 41.5 / 45.5)
Isolation of the MRSS .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 42

42

B

C

ILT39 ONS SRO NRC Examination QUESTION 43

43

SYS059 A4.03 - Main Feedwater (MFW) System
Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
Feedwater control during power increase and decrease .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%
- ICS is in MANUAL

Current conditions:
- AP/29 (Rapid Unit Shutdown) is initiated to reduce power to 15%

1) In accordance with AP/29, which Main FDW pump will be secured first?

2) What plant indications will be used to determine when the first Main FDW pump will be removed from service?

A.
1. 1A Main FDW pump
2. When a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65%

B.
1. 1A Main FDW pump
2. ˜ 325 MWe

C.
1. 1B Main FDW pump
2. When a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65%

D.
1. 1B Main FDW pump
2. ˜ 325 MWe

ILT39 ONS SRO NRC Examination QUESTION 43

43

C

General Discussion

Answer A Discussion

Incorrect,

First part is incorrect but plausible Knowledge of the FDW control system is essential for selecting the correct answer. AP/29 allows for tripping the "A" Main FDW pump but it is not the prefered pump.

Second part is correct. The FWP bias is manually adjusted to ensure that the FWP to remain in service provides most of the FDW flow as the unit load decreases. This will help ensure that the FWP to be stopped first "B" is the unloaded FWP. When a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65% the Main FDW will be tripped.

Answer B Discussion

Incorrect,

First part is incorrect but plausible Knowledge of the FDW control system is essential for selecting the correct answer. AP/29 allows for tripping the "A" Main FDW pump but it is not the prefered pump.

Second part is incorrect and plausible. This is the power level when the pump is secured during a normal unit shutdown using the OPS at power procedure.

Answer C Discussion

Correct,

First part is correct. Per AP/29 the "B" Main FDW pump will be secured first.

Second part is correct. The FWP bias is manually adjusted to ensure that the FWP to remain in service provides most of the FDW flow as the unit load decreases. This will help ensure that the FWP to be stopped first "B" is the unloaded FWP. When a statalarm for FDWP flow at or below minimum is received for the associated Main FDW pump and CTP < 65% the Main FDW will be tripped.

Answer D Discussion

Incorrect

First part is correct. Per AP/29 the "B" Main FDW pump will be secured first.

Second part is incorrect and plausible. This is the power level when the pump is secured during a normal unit shutdown using the OPS at power procedure.

Basis for meeting the KA

Question requires knowledge of securing a Main FDW during a plant shutdown. The initial pump to be secured is determined by a statalarm that is received based upon the selected pump and manual bias control during the power shutdown.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
EAP-APG R9 AP/29	

SYS059 A4.03 - Main Feedwater (MFW) System

Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)

Feedwater control during power increase and decrease .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 43

43

C

ILT39 ONS SRO NRC Examination QUESTION 44

44

C

SYS061 A2.07 - Auxiliary / Emergency Feedwater (AFW) System

Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Air or MOV failure .....

Given the following Unit 1 conditions:

Initial conditions:

- Both Main FDW pumps trip from 100% power

Current conditions:

- 1A and 1B SG level = 100 inches XSUR decreasing
- The air line to 1FDW-316 valve actuator is severed

1) Over the next fifteen minutes 1B SG level will __(1)__unless operator actions are taken.

2) Per the EOP, the next method used to control 1B SG level will be by throttling __(2)__.

Which ONE of the following completes the statements above?

A. 1. decrease
   2. 1FDW-44 in the control room

B. 1. decrease
   2. 1FDW-316 locally

C. 1. increase
   2. 1FDW-44 in the control room

D. 1. increase
   2. 1FDW-316 locally

General Discussion

Answer A Discussion

Incorrect.

First part one is incorrect and plausible. Initial SG level will decrease as SG inventory boils off. It is resonable to fail to recognize that only after EFW actuation that SG level will increase. Other valves fail closed on loss of air which make this choice even more reasonable. (ie 1HP-5)

Second part is correct. Enclosure 5.27 (Alternate Methods for Controlling EFDW Flow) of the EOP directs aligning flow through the S/U valves. If this alignment does not work then flow is controlled locally at the valve.

Answer B Discussion

Incorrect.

First part one is incorrect and plausible. Initial SG level will decrease as SG inventory boils off. It is resonable to fail to recognize that only after EFW actuation that SG level will increase. Other valves fail closed on loss of air which make this choice even more reasonable. (ie 1HP-5)

Second part is incorrect and plausible. Enclosure 5.27 (Alternate Methods for Controlling EFDW Flow) of the EOP for a failure of 1FDW-316 does have steps for using 1FWD-316. However this is used only if 1FDW-44 is not available.

Answer C Discussion

Correct.

First part is correct. Initial SG level will decrease following a RX trip as SG inventory boils off. With a loss of IA, AIA and N2, 1FDW-316 will fail open. With EFW actuated when the Main FDW pumps trip SG level will increase due to flow through 1FDW-316.

Second part is correct. Enclosure 5.27 (Alternate Methods for Controlling EFDW Flow) of the EOP directs aligning flow through the S/U valves. Only if this alignment does not work then flow is controlled locally at the valve.

Answer D Discussion

Incorrect.

First part is correct. Initial SG level will decrease following a RX trip as SG inventory boils off. With a loss of IA, AIA and N2, 1FDW-316 will fail open. With EFW actuated when the Main FDW pumps trip SG level will increase due to flow through 1FDW-316.

Second part is incorrect and plausible. Enclosure 5.27 (Alternate Methods for Controlling EFDW Flow) of the EOP for a failure of 1FDW-316 does have steps for using 1FWD-316. However this is used only if 1FDW-44 is not available.

Basis for meeting the KA

1FDW-316 is an air operated valve. The severing of the air line to the actuator removes all motive force and fails to actuated full open. This causes excessive feed water to the SG. The second part of the question relates to mitigating actions.
New 061A2.07

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
CF-EF R45 EOP Encl 5.27	

SYS061 A2.07 - Auxiliary / Emergency Feedwater (AFW) System

Ability to (a) predict the impacts of the following malfunctions or operations on the AFW; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Air or MOV failure .....

ILT39 ONS SRO NRC Examination

QUESTION 44

44

C

401-9 Comments:	Remarks/Status
	New 061A2.07

ILT39 ONS SRO NRC Examination QUESTION 45

45

B

SYS061 K6.01 - Auxiliary / Emergency Feedwater (AFW) System
Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: (CFR: 41.7 / 45.7)
Controllers and positioners .....

Given the following Unit 1 conditions:

Initial conditions:
- Time = 0400
- Reactor power = 100%
- Both Main FDW pumps trip

Current conditions:
- Time = 0403
- 1A and 1B MDEFDW Pumps operating
- Power has been lost to the Moore Controller for 1FDW-316

Which ONE of the following describes the response of "1B" SG level?

ASSUME NO OPERATOR ACTION

A. Decrease to "dryout"

B. Automatically controlled at 30"

C. Automatically controlled at 240"

D. Increase to overflow into the steam lines

ILT39 ONS SRO NRC Examination QUESTION 45

45

B

General Discussion

Answer A Discussion

Incorrect and plausible. It is reasonable for a control valve to fail closed on a loss of control power. If this were to be assumed then the SG level response will be to drcrease to dryout.

Answer B Discussion

Correct. Loss of power to the Moore controller will cause the level control system to control level at set point. In this case the set point would be 30 inches XSUR because the RCPs are still operating and Main FDW pumps have tripped.

Answer C Discussion

Incorrect and plausible. 240" is the controlling setpoint for the Moore controller if RCP's are off. In this case RCP's are running so the auto setpoint is 30".

Answer D Discussion

Incorrect and plausible. It is reasonable to conclude the failure mode is the same as for loss of power to the selected control train. This fails 1FDW-316 open resulting in SG overfill.

Basis for meeting the KA

Question requires knowledge of the affect of a loss of power to 1FDW-316 Moore controller would have on EF.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	

Development References

CF-EF R34

Student References Provided

SYS061 K6.01 - Auxiliary / Emergency Feedwater (AFW) System

Knowledge of the effect of a loss or malfunction of the following will have on the AFW components: (CFR: 41.7 / 45.7)

Controllers and positioners .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 46

46

B

SYS062 2.4.47 - AC Electrical Distribution System

SYS062 GENERIC

Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. (CFR: 41.10 / 43.5 / 45.12)

Given the following Unit 3 conditions:

- A voltage disturbance is occurring
- AP/34 (Degraded Grid) initiated
- Power Factor is leading
- Generator output = 800 Mwe
- Generator Hydrogen pressure = 60 psig
- Generator output voltage = 18.3 kV

Which ONE of the following is the limit on MVARs in accordance with the Generator Capability Curve?

REFERENCE PROVIDED

A. 325

B. 375

C. 410

D. 550

ILT39 ONS SRO NRC Examination QUESTION 46

46

B

General Discussion

Answer A Discussion

Incorrect and plausible. It is reasonable that the candidate may use the 45 psig H2 generator gas pressure line on the leading side curve instead of the 60 psig gas pressure line as stated.

Answer B Discussion

Correct: Determined using the attached curve from AP/34 that the generator is under-excited and the maximum (-) MVARS limit is ~375.

Answer C Discussion

Incorrect and plausible. It is reasonable that the candidate may use the 45 psig H2 generator gas pressure line on the lagging pf side of the curve instead of the 60 psig pressure line on the leading pf side as stated.

Answer D Discussion

Incorrect and plausible. It is reasonable that the candidate may use the 60 psig H2 generator gas pressure line on the lagging pf side of the curve instead of the 60 psig pressure line on the leading pf side as stated.

Basis for meeting the KA

Discussed with Chief Examiner and he stated that testing on monitoring generator output and using the generator capability curve would meet this KA.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References	Student References Provided
STG-015 R26 3AP/34	3AP/34

SYS062 2.4.47 - AC Electrical Distribution System

SYS062 GENERIC

Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material. (CFR: 41.10 / 43.5 / 45.12)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 47

47

C

SYS063 2.4.2 - DC Electrical Distribution System
SYS063 GENERIC
Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

Given the following Unit 2 conditions:

Initial conditions:
- Time = 0400
- Reactor power = 100%
- 2B RPS Channel inadvertently placed in Shutdown Bypass

Current conditions:
- Time = 0401
- 2DIA panel board is de-energized

1) __(1)__ will cause the “A” CRD Trip Breaker to trip.

2) The EOP __(2)__ be entered.

Which ONE of the following completes the statements above?

A. 1. BOTH the shunt and UV trip
   2. will

B. 1. BOTH the shunt and UV trip
   2. will NOT

C. 1. ONLY the UV trip
   2. will

D. 1. ONLY the UV trip
   2. will NOT

ILT39 ONS SRO NRC Examination QUESTION 47

47

C

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The 'A' breaker will trip due to a loss of vital AC power supplying the UV trip device through the 'A' RPS cabinet. The DC power from 2DIA is required for the shut trip to work. It is reasonable to miss the connection between 2DIA, and 2KVIA, as the 'A' RPS cabinet power supply and the 2DIA power to the shunt trip device.

Second part is correct. Selecting S/D Bypass at full power will result in a trip of the 'B' RPS channel on high RCS pressure. When 2DIA is deenergized the 2A RPS channel will deenergize resulting in the CRD breaker UV trip and a RX trip since the 'B' RPS cabinet is tripped. Therefore entry into the EOP will be required.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The 'A' breaker will trip due to a loss of vital AC power supplying the UV trip device through the 'A' RPS cabinet. The DC power from 2DIA is required for the shut trip to work. It is reasonable to miss the connection between 2DIA, and 2KVIA, as the 'A' RPS cabinet power supply and the 2DIA power to the shunt trip device.

Second part is incorrect and plausible. The candidate could reasonably conclude that "shut down bypass" prevents the RPS channel from tripping. If the reactor is assumed not to trip then EOP entry is not required.

Answer C Discussion

Correct.

First part is correct. De-energizing 2DIA will result in a loss of power to KVIA. This will cause the associated CRD breaker to trip due to the UV trip. The shunt trip device requires power in order to trip so it will not be capable to open its associated CRD breakers.

Second part is correct. Selecting S/D Bypass at full power will result in a trip of the 'B' RPS channel on high RCS pressure. When 2DIA is deenergized the 2A RPS channel will deenergize resulting in the CRD breaker UV trip and a RX trip since the 'B' RPS cabinet is tripped. Therefore entry into the EOP will be required.

Answer D Discussion

Incorrect.

First part is correct. De-energizing 2DIA will result in a loss of power to KVIA. This will cause the associated CRD breaker to trip due to the UV trip. The shunt trip device requires power in order to trip so it will not be capable to open its associated CRD breakers.

Second part is incorrect and plausible. The candidate could reasonably conclude that "shut down bypass" prevents the RPS channel from tripping. If the reactor is assumed not to trip then EOP entry is not required.

Basis for meeting the KA

Question requires knowledge of how the DC system affects the RPS system and reslting EOP entry due to a reactor trip.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
IC-RPS R16, R5.6	

SYS063 2.4.2 - DC Electrical Distribution System

SYS063 GENERIC

Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

ILT39 ONS SRO NRC Examination QUESTION 47

47

C

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 48

48

B

SYS063 K3.02 - DC Electrical Distribution System

Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7 / 45.6)

Components using DC control power .....

Given the following Unit 1 conditions:

- 1A HWP breaker in the "TEST" position

1) The 1A HWP breaker __(1)__ be closed remotely using the Control Room switch.

2) If the 1A HWP breaker DC control power fuses are removed, 1A HWP breaker __(2)__ be closed locally using the pistol grip switch located on the front of the breaker cubicle.

Which ONE of the following completes the statements above?

A. 1. can
2. can

B. 1. can
2. can NOT

C. 1. can NOT
2. can

D. 1. can NOT
2. can NOT

ILT39 ONS SRO NRC Examination QUESTION 48

48

B

General Discussion

Pulling the control power fuses causes a loss of control power to the assocatied 4160 volt breaker. With no control power, the breaker will not operate from the control room or the local switch. It can however still be operated manually at the breaker.

Answer A Discussion

Incorrect.

First part is correct. In the test position the breaker can be closed remotely or locally.

Second part is incorrect and plausible. The local pistol grip switch only works with the breaker in the test position and DC control power present. The breaker can still be closed locally but must be done using the manual close pushbutton.

Answer B Discussion

Correct.

First part is correct. In the test position the breaker can be closed remotely or locally.

Second part is correct. With control power fuses pulled the breaker cannot be closed electrically either locally or remotely.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. The candidate could have the misconception that the breaker could only be operated locally while in test.

Second part is incorrect and plausible. The local pistol grip switch only works with the breaker in the test position and DC control power present. The breaker can still be closed locally but must be done using the manual close pushbutton.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. The candidate could have the misconception that the breaker could only be operated locally while in test.

Second part is correct. With control power fuses pulled the breaker cannot be closed electrically either locally or remotely.

Basis for meeting the KA

Question requires knowledge of how a 4160 volt breaker operates with a loss of control power.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EL-CB R5	

SYS063 K3.02 - DC Electrical Distribution System

Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7 / 45.6)

Components using DC control power .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 48

48

B

ILT39 ONS SRO NRC Examination QUESTION 49

49

B

SYS064 A1.03 - Emergency Diesel Generator (ED/G) System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: (CFR: 41.5 / 45.5)

Operating voltages, currents, and temperatures .....

Given the following conditions:

Operators are preparing to synchronize KHU-2 to the grid in accordance with OP/0/A/1106/019, (Keowee Hydro At Oconee)

The operator notes the following indications:

- Grid Frequency = 59.9 cycles
- Keowee Frequency = 60.3 cycles
- Keowee 2 Line Volts = 13.7 kV
- Keowee 2 Output Volts = 15.2 kV

1) __ (1) __ will be used to adjust the synchroscope indication.

2) If ACB-2 is closed with the above indications, generator MVARs will be __ (2) __.

Which ONE of the following completes the statements above?

A. 1. UNIT 2 AUTO VOLTAGE ADJUSTER
   2. positive

B. 1. UNIT 2 SPEED CHANGER MOTOR
   2. positive

C. 1. UNIT 2 AUTO VOLTAGE ADJUSTER
   2. negative

D. 1. UNIT 2 SPEED CHANGER MOTOR
   2. negative

ILT39 ONS SRO NRC Examination QUESTION 49

49

B

General Discussion

Answer A Discussion

Incorrect:

First part is incorrect and plausible. The voltage regulator (AVA) and the generator load/speed control are the two primary controls for the Keowee unit. It is reasonable that the candidate will confuse the two control devices and determine the AVA is used to adjust the synchroscope.

Second part is correct. Generator output voltage is greater than Line volts which will cause MVARs to be positive.

Answer B Discussion

Correct:

First part is correct. Keowee frequency is higher than the grid so synchroscope will be spinning clockwise which will require use of the Unit 2 Speed Changer motor to lower the Keowee generator frequency.

Second part is correct. Generator output voltage is greater than Line volts which will cause MVARs to be positive.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. The voltage regulator (AVA) and the generator load/speed control are the two primary controls for the Keowee unit. It is reasonable that the candidate will confuse the two control devices and determine the AVA is used to adjust the synchroscope.

Second part is incorrect and plausible. It is reasonable that the candidate not recognize the direction the voltage missmatch is in and determine negative MVARs will be generated.

Answer D Discussion

Incorrect. Plausible

First part is correct. Keowee frequency is higher than the grid so synchroscope will be spinning clockwise which will require use of the Unit 2 Speed Changer motor to lower the Keowee generator frequency.

Second part is incorrect and plausible. It is reasonable that the candidate not recognize the direction the voltage missmatch is in and determine negative MVARs will be generated.

Basis for meeting the KA

Requires monitoring parameters and predicting response when operating ED/G system controls. Additionally requires ability to manipulate controls of KHU to prevent exceeding design limits as unit is brought on-line.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	ONS 2009A RO Q#49

Development References

EL-KHG R7, R20
OP/1106/019
ONS 2009A RO Q#49

Student References Provided

SYS064 A1.03 - Emergency Diesel Generator (ED/G) System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: (CFR: 41.5 / 45.5)

Operating voltages, currents, and temperatures .....

ILT39 ONS SRO NRC Examination

QUESTION 49

49

B

401-9 Comments:

Remarks/Status

Can't write discriminatory question on this KA.
New KA 064A1.03

Change second part - high miss rate

C

ILT39 ONS SRO NRC Examination QUESTION 50

50

SYS064 K6.08 - Emergency Diesel Generator (ED/G) System
Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: (CFR: 41.7 / 45.7)
Fuel oil storage tanks .....

Given the following conditions:

- Two Keowee Tailrace level instruments are OOS

1) Commercial operation of the Keowee Hydro Units ___(1)___ permitted by SLC 16.8.4 (Keowee Operational Restrictions).

2) Keowee operating head is <u>normally</u> calculated by using ___(2)___ from Oconee Control Room indications.

Which ONE of the following completes the statements above?

A. 1. is
   2. Forebay Elevation <u>plus</u> Tailrace Elevation

B. 1. is
   2. Forebay Elevation <u>minus</u> Tailrace Elevation

C. 1. is NOT
   2. Forebay Elevation <u>plus</u> Tailrace Elevation

D. 1. is NOT
   2. Forebay Elevation <u>minus</u> Tailrace Elevation

ILT39 ONS SRO NRC Examination QUESTION 50

50

C

General Discussion

Per SLC 16.8.4, for each Keowee Unit, at least one Forebay Level sensor and one Tailrace Level sensor shall be OPERABLE. There are two Tailrace and two Forebay Level instruments that input into the Keowee digital governor control system. If the one required Forebay or required Tailrace level sensor(s) are inoperable, the required action is to suspend commercial operation of both Keowee Hydro Units AND manually input Forebay/Tailrace level(s) into the digital governor immediately.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. Keowee Commercial generation is not permitted by SLC 16.8.4 due to not having either of the required Tailrace instruments available. It is reasonable that the candidate conclude commercial operation is permitted as long as forebay elevation is available.

Second part is correct. Keowee operating head is calculated by adding Tailrace elevation and Forebay elevation. Forebay level reference point is a value above 700' MSL and Tailrace level reference is a value below 700' MSL; therefore, the two values are added together to determine net operating head for the Keowee Units per the guages in Unit 2 Control Room.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. Keowee Commercial generation is not permitted by SLC 16.8.4 due to not having either of the required Tailrace instruments available. It is reasonable that the candidate conclude commercial operation is permitted as long as forebay elevation is available.

Second part incorrect and plausible. The candidate must know the reference point at which the gauges read in the ONS Unit 2 control room. It is intuitive to subtract the two elevation readings. Also the gauges at Keowee Hydro Station both read MSL elevation and are not referenced to 700'. If so, you would subtract the two values to determine Keowee Unit net operating head. Also the SLC bases states the KHUs use gross head (Forebay level - Tailrace level).

Answer C Discussion

Correct.

First part is correct. Per SLC 16.8.4, Keowee Commercial generation is not allowed if both Keowee Tailrace instruments are OOS.

Second part is correct. Keowee operating head is calculated by adding Tailrace elevation and Forebay elevation. Forebay level reference point is a value above 700' MSL and Tailrace level reference is a value below 700' MSL; therefore, the two values are added together to determine net operating head for the Keowee Units per the guages in Unit 2 Control Room.

Answer D Discussion

Incorrect.

First part is correct. Per SLC 16.8.4, Keowee Commercial generation is not allowed if both Keowee Tailrace instruments are OOS.

Second part incorrect and plausible. The candidate must know the reference point at which the gauges read in the ONS Unit 2 control room. It is intuitive to subtract the two elevation readings. Also the gauges at Keowee Hydro Station both read MSL elevation and are not referenced to 700'. If so, you would subtract the two values to determine Keowee Unit net operating head. Also the SLC bases states the KHUs use gross head (Forebay level - Tailrace level).

Basis for meeting the KA

Discussed KA with chief examiner. He stated we can ask a question concerning Keowee lake level since it is the driving force of our backup power generators.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

EL-KHG R24
SLC 16.8.4

Student References Provided

ILT39 ONS SRO NRC Examination QUESTION 50

50

C

SYS064 K6.08 - Emergency Diesel Generator (ED/G) System

Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: (CFR: 41.7 / 45.7)

Fuel oil storage tanks .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 51

51

D

SYS073 A2.01 - Process Radiation Monitoring (PRM) System

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use procedures to cor- rect, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Erratic or failed power supply .....

Given the following Unit 1 conditions:

Initial conditions:

- Unit 1 in Mode 5
- Unit 1 RB Purge release in progress
- 1RIA-46 (Vent Gas HR) OOS

Current conditions:

- Loss of power to RM-80 skid of 1RIA-45 (NORM Vent Gas)
- 1SA8/B9 RM PROCESS MONITOR RADIATION HIGH in alarm
- 1SA8/B10 RM PROCESS MONITOR FAULT in alarm

1) The RB Purge Fan will __(1)__.

2) RB Purge release may __(2)__.

Which ONE of the following completes the statements above?

A. 1. remain running
   2. continue if 1RIA-45 is re-energized within one hour.

B. 1. automatically trip
   2. be re-initiated as long as 1RIA-45 is re-energized within one hour.

C. 1. remain running
   2. continue as long as two independent samples agree.

D. 1. automatically trip
   2. be re-initiated as long as two independent samples agree prior to the release.

General Discussion

Answer A Discussion

Incorrect,

First part is incorrect and plausible. There are systems where a loss of power will prevent a trip of the associated equipment. The ES digitial cabinets are an example. Therefore it is reasonable that a candidate may conclude a loss of power to the RM-80 skid will have no effect on the RB purge fans.

Second part is incorrect and plausible. Per SLC 16.11.3 Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. A release is allowed to continue for "Planned" outages of instrumentation < 1 Hr.

Answer B Discussion

Incorrect,

First part is correct. For a loss of power to the RM80 skid for an RIA, any interlocks for that RIA will occur as if a HIGH ALARM had occurred. The RB Purge fans are interlocked with the RM80 skid to trip.

Second part is incorrect and plausible. Per SLC 16.11.3 Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. A release is allowed to continue for "Planned" outages of instrumentation < 1 Hr.

Answer C Discussion

Incorrect

First part is incorrect and plausible. There are systems where a loss of power will prevent a trip of the associated equipment. The ES digitial cabinets are an example. Therefore it is reasonable that a candidate may conclude a loss of power to the RM-80 skid will have no effect on the RB purge fans.

Second part is incorrect and plausible. Per SLC 16.11.3 Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. A release is allowed to continue for "Planned" outages of instrumentation < 1 Hr.

Answer D Discussion

C.orrect,

First part is correct. For a loss of power to the RM80 skid for an RIA, any interlocks for that RIA will occur as if a HIGH ALARM had occurred. The RB Purge fans are interlocked with the RM80 skid to trip.

Second part is correct. SLC16.11.3 requires two independent samples for any subsequent releases if RIA 37/38 are not available.

Basis for meeting the KA

Requires knowledge of impact of a loss of power to an RIA skid and the SLC actions required due to the failure.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References	Student References Provided
RAD-RIA R16 SLC 16.11.3, AP/18	

SYS073 A2.01 - Process Radiation Monitoring (PRM) System

Ability to (a) predict the impacts of the following malfunctions or operations on the PRM system; and (b) based on those predictions, use

ILT39 ONS SRO NRC Examination QUESTION 51

51

D

procedures to cor- rect, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)
Erratic or failed power supply .....

401-9 Comments:	Remarks/Status
	Ref links

ILT39 ONS SRO NRC Examination QUESTION 52

52

A

SYS073 K5.01 - Process Radiation Monitoring (PRM) System

Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: (CFR: 41.5 / 45.7)

Radiation theory, including sources, types, units, and effects .....

Given the following Unit 1 conditions:

Initial conditions:

- Time = 1200
- Reactor power = 35%
- 1A steam generator tube leak = 2.1 gpd stable
- RCS activity = 0.25 µCi/ml DEI increasing

Current conditions:

- Time = 1400
- Reactor power = 35%
- NO change in 1A SG tube leak rate
- RCS activity = 0.65 µCi/ml DEI and increasing

Which ONE of the following describes the response of the radiation monitors between 1200 and 1400?

A. 1RIA-16 (Main Steam Line Monitor) increases
1RIA-40 (CSAE Off-gas) increases

B. 1RIA-16 (Main Steam Line Monitor) increases
1RIA-40 (CSAE Off-gas) remains constant

C. 1RIA-59 (N-16 monitor) increases
1RIA-40 (CSAE Off-gas) increases

D. 1RIA-59 (N-16 monitor) increases
1RIA-40 (CSAE Off-gas) remains constant.

General Discussion

Answer A Discussion

Correct:

First part is correct. RIA-16 will respond to ALL activity, therefore will increase as RCS activity increases over the two hours period referenced in the question.

Second part is correct. RIA-40 will respond to ALL activity, therefore will increase as RCS activity increases over the two hours period referenced in the question.

Answer B Discussion

Incorrect

First part is correct. RIA-16 will respond to ALL activity, therefore will increase as RCS activity increases over the two hours period referenced in the question.

Second part is incorrect and plausible. 1RIA-40 will be affected by the fuel failure, it is reading Air Ejector off gas flow and not directly monitoring the RCS. As more fission products leak into the RCS and RCS activity increases the amount of fission product gasses reaching the secondary will also increase. It is reasonable for the candidate to conclude that since the leak is not increasing the amount of fission product gasses reaching the secondary will not change.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. 1RIA-59 (N-16 detectors) will not increase over the two hour period referenced in the question as RX power is the constant. The production of the N16 isotope is proportional to power. It is reasonable that a candidate can conclude all activity will increase as more RCS is leaked into the secondary.

Second part is correct. RIA-40 will respond to ALL activity, therefore will increase as RCS activity increases over the two hours period referenced in the question.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. 1RIA-59 (N-16 detectors) will not increase over the two hour period referenced in the question as RX power is the constant. The production of the N16 isotope is proportional to power. It is reasonable that a candidate can conclude all activity will increase as more RCS is leaked into the secondary.

Second part is incorrect and plausible. 1RIA-40 will be affected by the fuel failure, it is reading Air Ejector off gas flow and not directly monitoring the RCS. As more fission products leak into the RCS and RCS activity increases the amount of fission product gasses reaching the secondary will also increase. It is reasonable for the candidate to conclude that since the leak is not increasing the amount of fission product gasses reaching the secondary will not change.

Basis for meeting the KA

Knowledge of the operational implications of process RIA responses are required to determine expected RIA response to SGTR and failed fuel. Additionally, an understanding of N-16 production and decay is needed to understand RIA-59 responses (or lack of response) to failed fuel. RIA-40 is a process monitor.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	ONS 2009A RO Q#51

Development References	Student References Provided
RAD-RIA R2 ONS 2009A RO Q51	

ILT39 ONS SRO NRC Examination QUESTION 52

52

A

SYS073 K5.01 - Process Radiation Monitoring (PRM) System

Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: (CFR: 41.5 / 45.7)

Radiation theory, including sources, types, units, and effects .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 53

53

C

SYS076 A3.02 - Service Water System (SWS)
Ability to monitor automatic operation of the SWS, including: (CFR: 41.7 / 45.5)
Emergency heat loads .....

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 1% stable

Current conditions:
- RCS pressure = 536 psig decreasing
- RB pressure = 2.7 psig increasing

1) __(1)__ LPSW pumps will be operating.

2) 1LPSW-18 will __(2)__.

Which ONE of the following completes the statements above?

A. 1. two
   2. NOT receive a signal to open

B. 1. two
   2. receive a signal to open

C. 1. three
   2. NOT receive a signal to open

D. 1. three
   2. receive a signal to open

ILT39 ONS SRO NRC Examination QUESTION 53

53

C

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The candidate must recognize that 536 psig in the RCS is below the setpoint for ES channels 3 & 4 and that these channels will start all three LPSW pumps. It is reasonable to conclude the candidate may not recognize these conditions and conclude only two pumps are required to be running.

Second part is correct. The normal position of 1LPSW 18 (1A RBCU Outlet) is throttled open. At 2.7 psig RB pressure ES channels 5&6 would not have actuated. Therefore 1LPSW-18 will remain in its current position.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The candidate must recognize that 536 psig in the RCS is below the setpoint for ES channels 3 & 4 and that these channels will start all three LPSW pumps. It is reasonable to conclude the candidate may not recognize these conditions and conclude only two pumps are required to be running.

Secound part is incorrect and plausible. The candidate must recognize that 2.7 psig in the RB is below the setpoint for ES channels 5 & 6 and that these channels will fully open 1LPSW-18 fully when actuated. It is reasonable to conclude the candidate may not recognize these conditions and conclude 1LPSW-18 is required to be full open.

Answer C Discussion

Correct.

First part is correct. All three LPSW pumps will start on ES channel 3&4 actuation. This occurs at less than 550 psig RCS pressure.

Second part is correct. The normal position of 1LPSW 18 (1A RBCU Outlet) is throttled open. At 2.7 psig RB pressure ES channels 5&6 would not have actuated. Therefore 1LPSW-18 will remain in its current position.

Answer D Discussion

Incorrect.

First part is correct. All three LPSW pumps will start on ES channel 3&4 actuation. This occurs at less than 550 psig RCS pressure.

Secound part is incorrect and plausible. The candidate must recognize that 2.7 psig in the RB is below the setpoint for ES channels 5 & 6 and that these channels will fully open 1LPSW-18 fully when actuated. It is reasonable to conclude the candidate may not recognize these conditions and conclude 1LPSW-18 is required to be full open.

Basis for meeting the KA

Question requires the candidate to know the ES actuaion setpoints and what LPSW components are affected to supply water to the RBCUs.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References	Student References Provided
SSS-LPW R14	

SYS076 A3.02 - Service Water System (SWS)
Ability to monitor automatic operation of the SWS, including: (CFR: 41.7 / 45.5)
Emergency heat loads .....

ILT39 ONS SRO NRC Examination QUESTION 53

53

C

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 54

54

D

SYS078 K1.03 - Instrument Air System (IAS)

Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

Containment air .....

Given the following Unit 2 conditions:

- Reactor power = 100%
- RB pressure = 12.8 psia

Which ONE of the following describes how RB pressure will be <u>increased</u> to within the limits per PT/2/A/0600/001 (Periodic Instrument Surveillance)?

A. 2PR-42 (RB Purge Disch to Unit Vent) will be opened and this alignment is limited to 1 hour.

B. 2PR-42 (RB Purge Disch to Unit Vent) will be opened and this alignment is limited to 4 hours.

C. 2IA-90 (IA Pent Isolation) will be opened and this alignment is limited to 1 hour.

D. 2IA-90 (IA Pent Isolation) will be opened and this alignment is limited to 4 hours

---

General Discussion

Answer A Discussion

Incorrect and plausible.

2PR-42 is the RB Purge Disch to Unit Vent. It is reasonable for the candidate to conclude that opening this vent will allow air to enter the RB and increase RB pressure.

The time limit is incorrect. TS does require containment pressure to be restored within limits within 1 hour per TS 3.6.4. The pressure given is within the lower pressure limit deviation (1.9 psia) based upon 14.7 psia as the zero pressure reference. However the pressure deviation (1.9 psia) is outside the upper TS limit pressure deviation where the 1 hour limit is applicable.

Answer B Discussion

Incorrect and plausible.

2PR-42 is the RB Purge Disch to Unit Vent. It is reasonable for the candidate to conclude that opening this vent will allow air to enter the RB and increase RB pressure.

The 4 hour time limit is correct per TS 3.6.3 for having 2IA-90 open.

Answer C Discussion

Incorrect and plausible.

2IA-90 must be opened to align IA to the RB in order to return containment pressure to within limits.

The time limit is incorrect. TS does require containment pressure to be restored within limits within 1 hour per TS 3.6.4. The pressure given is within the lower pressure limit deviation (1.9 psia) based upon 14.7 psia as the zero pressure reference. However the pressure deviation (1.9 psia) is outside the upper TS limit pressure deviation where the 1 hour limit is applicable.

Answer D Discussion

Correct.

2IA-90 must be opened to align IA to the RB in order to return containment pressure to within limits.

The 4 hour time limit is correct per TS 3.6.3 for having 2IA-90 open.

Basis for meeting the KA

Requires knowledge of physical relationship between IA system and containment (RB) and the requirements associated with aligning IA to the RB during plant operation

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References

SSS-IA R14
OP/2/A/1102/014
TS 3.6.4

Student References Provided

SYS078 K1.03 - Instrument Air System (IAS)
Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)
Containment air .....

ILT39 ONS SRO NRC Examination QUESTION 54

54

D

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 55

55

B

SYS103 K4.06 - Containment System

Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)

Containment isolation system .....

Given the following Unit 1 conditions:

- Reactor is shutdown following a transient
- RCS temperature = 180°F decreasing

Which ONE of the following will prevent opening ALL of the following valves 1PR-1, 2, 3, 4, 5, 6?

A. 1RIA-46 HIGH alarm actuates

B. Reactor Building pressure at 3.5 psig

C. Statalarm SA9/B3, RB Purge Inlet Temperature Low

D. Vacuum on suction piping of the Main Purge Fan at 10 inches of water

---

ILT39 ONS SRO NRC Examination QUESTION 55

55

B

General Discussion

Answer A Discussion

Incorrect and plausible.1RIA-46 will close 1PR-2 thru 5 on a high alarm. However it does not close 1PR-1 & 6.

Answer B Discussion

Correct: RB pressure >3 psig will actuate ES channels 1-4. ES channel 1 and 2 will close 1PR-1 thru 6.

Answer C Discussion

Incorrect and plausible. When Statalarm SA9/B3 comes in the operator is required to stop building purge. However inlet temperature is not interlocked with either the valves or fans.

Answer D Discussion

Incorrect and plausible.10 inches of water is an interlock that will trip the running purge fan. However this interlock does not affect the purge valves.

Basis for meeting the KA

Question requires knowledge of design featues that will cause the RB purge system to isolate.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
PNS-RBP R5, R7 IC-RIA R2	

SYS103 K4.06 - Containment System

Knowledge of containment system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)

Containment isolation system .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 56

56

B

SYS001 A1.06 - Control Rod Drive System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CRDS controls including: (CFR: 41.5/45.5)

Reactor power .....

Unit 1 initial conditions:

- Time 0900
- Reactor power = 68%
- CR group 2 rod 3 dropped into the core
- 1B2 RCP secured
- 1SA4/C1 QUADRANT POWER TILT in alarm

Current conditions

- Time 1300
- Encl 4.15 (Recovery of Dropped/Misaligned Safety or Regulating Control Rod With Diamond In automatic) of OP/1/A/1105/019 (Control Rod Drive System) in progress.
- Reactor Engineering has determined no maneuvering limitations other than those specified by the procedure need to be applied

1) What is the maximum reactor power allowed by Tech Spec?

2) During the recovery of the dropped control rod, what procedural limitations are required for the rate of control rod withdrawal?

A. 1. 60%
2. Withdrawn with no designated wait periods

B. 1. 45%
2. Withdrawn with no designated wait periods

C. 1. 60%
2. Withdrawn in 10% increments spaced 30 min apart

D. 1. 45%
2. Withdrawn in 10% increments spaced 30 min apart

ILT39 ONS SRO NRC Examination QUESTION 56

56

B

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The candidate must recognize that one RPC is off and know that 75% power is the maximum power level for three pumps. With 4 pumps running the maximum power level is 100%. Therefore 60% of 100% power is 60% making it reasonable that the candidate may assume 60% is correct.

Second part is correct. This Control Rod Drive Procedure has no required wait periods in between incremental CR withdrawals if recovering CR within 24 hours,

Answer B Discussion

Correct,

First part is correct. TS 3.2.3 Quadrant Power Tilt requires power reduction to < 60% of allowed thermal power. With 1 RCP off the maximum rated power is 75%. Therefore 60% of 75% power is 45% power.

Second part is correct. This Control Rod Drive Procedure has no required wait periods in between incremental CR withdrawals if recovering CR within 24 hours,

Answer C Discussion

Incorrect,

First part is incorrect and plausible. The candidate must recognize that one RPC is off and know that 75% power is the maximum power level for three pumps. With 4 pumps running the maximum power level is 100%. Therefore 60% of 100% power is 60% making it reasonable that the candidate may assume 60% is correct.

Second part is incorrect and plausible. The candidate must recognize that <24 hours has elapsed since the rod dropped. It is reasonable for the candidate to confuse or not know the 24 hour required.

Answer D Discussion

Incorrect.

First part is correct. TS 3.2.3 Quadrant Power Tilt requires power reduction to < 60% of allowed thermal power. With 1 RCP off the maximum rated power is 75%. Therefore 60% of 75% power is 45% power.

Second part is incorrect and plausible. The candidate must recognize that <24 hours has elapsed since the rod dropped. It is reasonable for the candidate to confuse or not know the 24 hour required.

Basis for meeting the KA

Requires knowledge of TS limits on reactor power during a dropped control rod recovery.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References

IC-CRI R28, R33
OP/1105/019 Encl 4.15
TS 3.1.4

Student References Provided

SYS001 A1.06 - Control Rod Drive System

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CRDS controls including: (CFR: 41.5/45.5)

Reactor power .....

ILT39 ONS SRO NRC Examination QUESTION 56

56

B

401-9 Comments:	Remarks/Status
	format

ILT39 ONS SRO NRC Examination QUESTION 57

57

A

SYS011 K1.03 - Pressurizer Level Control System (PZR LCS)

Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

PZR PCS .....

Given the following on Unit 1:

Initial conditions
- Reactor Power = 100%

Current conditions:
- The air line breaks off of the 1HP-120 valve actuator

1) 1HP-120 will ___(1)___.

2) Assuming no operator action, the resulting Control Room Pressurizer level will ___(2)___.

Which ONE of the following completes the statements above?

A. 1. close
   2. de-energize the Pzr heaters at 80 inches

B. 1. close
   2. de-energize the Pzr heaters at 85 inches

C. 1. open
   2. cause the Pzr spray valve to open at 2205 psig

D. 1. open
   2. cause the Pzr spray valve to open at 2255 psig

ILT39 ONS SRO NRC Examination QUESTION 57

57

A

General Discussion

Answer A Discussion

Correct.

First part is correct. Loss of air to 1HP-120 will cause the valve to fail closed.

Second part is correct. This will cause Pzr level to decrease and the heaters will de-energize at 80 inches.

Answer B Discussion

Incorrect.

First part is correct. Loss of air to 1HP-120 actuator will cause the valve to fail closed.

Second part is incorrect and plausible. The SSF uncompensated Pzr level has an 85" setpoint for de-energizing PZR heaters.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. Other primary valves fail open (ie HP-31).

Second part is incorrect and plausible. 2205 psig is the setpoint for the spray valve opening. It is reasonable that the candidate may conclude that if 1HP-120 fails open that PZR level will rise thus squeezing the PZR bubble causing RCS pressure to rise and spray valve to open.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. Other primary valves fail open (ie HP-31)

Second part is incorrect and plausible. 2225 psig is the setpoint for the RCS high pressure statalarm. It is reasonable that the candidate may conclude that if 1HP-120 fails open that PZR level will rise thus squeezing the PZR bubble causing RCS pressure to rise causing the RCS high pressure statalarm to annunciate.

Basis for meeting the KA

Question requires knowledge of how a failure the Pzr level control valve will affect the Pzr heaters.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References

PNS-PZR R5

Student References Provided

SYS011 K1.03 - Pressurizer Level Control System (PZR LCS)

Knowledge of the physical connections and/or cause-effect relationships between the PZR LCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8)

PZR PCS .....

401-9 Comments:

Remarks/Status

New KA since there is no connection between Pzr level control and ICS???
New KA 011K1.03

C

ILT39 ONS SRO NRC Examination QUESTION 58 58

SYS014 2.1.20 - Rod Position Indication System (RPIS)
SYS014 GENERIC
Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)

Given the following Unit 1 conditions:

Initial conditions:

- OP/**1**/A/1105/019 (Control Rod Drive System) initiated
- Enclosure 4.15 (Recovery Of Dropped/Misaligned Safety Or Regulating Control Rod With Diamond in Automatic) in progress
- Step 2.3.2 in part states "Ensure desired rod API/RPI indications agree. (PI Panel)"

1) The RO will use the __(1)__ switch located on the PI panel to determine if API/RPI indications agree.

2) During this control rod recovery, the __(2)__.

Which ONE of the following completes the statements above?

A. 1. "position reset"
   2. Controlling CRD Group will maintain Rx power constant

B. 1. "position reset"
   2. Reactor Operator will insert the regulating rods to stop the power increase

C. 1. "position select"
   2. Controlling CRD Group will maintain Rx power constant

D. 1. "position select"
   2. Reactor Operator will insert the regulating rods to stop the power increase

---

ILT39 ONS SRO NRC Examination QUESTION 58

58

C

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. It is reasonable to think that the "position reset" switch could be used due to the procedure step stating "Ensure desired rod API/RPI indication agree". The "position reset" toggle switch is used to adjust the relative position of the position indicator meters if a descrepancy exists between the meter indication and the actual position for RPI and it is located on the PI Panel just above the Position Select switch.

Second part correct. With the Diamond in automatic, the regulating control rods will maintain Rx power constant as the control rod is recovered.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. It is reasonable to think that the "position reset" switch could be used due to the procedure step stating "Ensure desired rod API/RPI indication agree". The "position reset" toggle switch is used to adjust the relative position of the position indicator meters if a descrepancy exists between the meter indication and the actual position for RPI and it is located on the PI Panel just above the Position Select switch.

Second part is incorrect and plausible. The candidate must recognize that the Diamond is in automatic, If the Diamond is in manual, the operator will insert regulating rods to control Tave and Rx power.

Answer C Discussion

Correct.

First part is correct. The position select switch located on the PI panel alternates the displayed position indication for all 69 control rods between RPI and API indications displayed on the PI panel. This switch would be used to satisfy the procedure step.

Second part correct. With the Diamond in automatic, the regulating control rods will maintain Rx power constant as the control rod is recovered.

Answer D Discussion

Incorrect.

First part is correct. The position select switch located on the PI panel alternates the displayed position indication for all 69 control rods between RPI and API indications displayed on the PI panel. This switch would be used to satisfy the procedure step.

Second part is incorrect and plausible. The candidate must recognize that the Diamond is in automatic, If the Diamond is in manual, the operator will insert regulating rods to control Tave and Rx power.

Basis for meeting the KA

Requires knowledge of control rod position indication system and the ability to determine the desired component to operate to satisfy a specific procedure step to determine if API/RPI indications agree.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References

IC-CRI R29
OP/1/A/1105/019
PI Panel Drawing

Student References Provided

SYS014 2.1.20 - Rod Position Indication System (RPIS)
SYS014 GENERIC
Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)

ILT39 ONS SRO NRC Examination QUESTION 58

58

C

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 59

59

A

SYS007 K3.01 - Pressurizer Relief Tank/Quench Tank System (PRTS)
Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: (CFR: 41.7 / 45.6)
Containment .....

Given the following Unit 1 conditions:

Initial conditions:
- Loss of all Feedwater
- HPI forced cooling initiated
- Quench Tank pressure = 40 psig increasing

Current conditions:
- Quench Tank pressure = 3 psig stable

1) RB Normal sump level will __(1)__.

2) 1RIA-47 radiation level will __(2)__.

Which ONE of the following completes the statements above?

A. 1. increase
   2. increase

B. 1. increase
   2. remain constant

C. 1. remain constant
   2. increase

D. 1. remain constant
   2. remain constant

General Discussion

Answer A Discussion

Correct.

First Part is correct. A decrease in Quench Tank pressure indicates the Rupture Disk has blown. Inventory from the Quench Tank will go to the RBNS causing a level increase.

Second part is correct. RCS activity in the inventory will result in 1RIA-47 reading increase.

Answer B Discussion

Incorrect.

First Part is correct. A decrease in Quench Tank pressure indicates the Rupture Disk has blown. Inventory from the Quench Tank will go to the RBNS causing a level increase.

Second part is incorrect and plausible. If RCS activity is assumed to be negligible then it is reasonable for the candidate to conclude 1RIA-47 will remain constant.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. First part is incorrect and plausible. It is reasonable that the candidate does not conclude that the quench tank rupture disc is blown or determines the quench tank inventory is going to Misc Waste via the Component Drain flow path.

Second part is correct. RCS activity in the inventory will result in 1RIA-47 reading increase.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. First part is incorrect and plausible. It is reasonable that the candidate does not conclude that the quench tank rupture disc is blown or determines the quench tank inventory is going to Misc Waste via the Component Drain flow path.

Second part is incorrect and plausible. If RCS activity is assumed to be negligible then it is reasonable for the candidate to conclude 1RIA-47 will remain constant.

Basis for meeting the KA

Requires knowledge of the impact of discharge from PORV to the Quench Tank and indications of failed/blown rupture disk and the impact of the failure on containment parameters.

Plausibility based around whether applicant recognizes status of QT rupture disk. If disk is assumed to have blown, then containment sump would rise. With normal levels of RCS activity an applicant would have to determine what the effects on containment radiation would be and where the leakage is directed (Misc. Waste vs. RBNS)

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	

Development References	Student References Provided
PNS-CS R7 RAD-RIA r12a	

SYS007 K3.01 - Pressurizer Relief Tank/Quench Tank System (PRTS)

Knowledge of the effect that a loss or malfunction of the PRTS will have on the following: (CFR: 41.7 / 45.6)

Containment .....

ILT39 ONS SRO NRC Examination QUESTION 59

59

A

401-9 Comments:	Remarks/Status
	Discuss with NRC about KA. New KA 017K6.01

ILT39 ONS SRO NRC Examination QUESTION 60

60

B

SYS034 A4.01 - Fuel Handling Equipment System (FHES)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
Radiation levels .....

Given the following Unit 3 conditions:

- Refueling in progress
- RB Purge is operating
- Spent Fuel Assembly is dropped
- 3RIA-49 HIGH alarm actuates

Which ONE of the following describes the AUTOMATIC actions that will occur?

A. 3LWD-2 closes AND RB Purge fan trips

B. 3LWD-2 closes AND RB Evacuation alarm sounds

C. RB Purge fan trips AND RB Evacuation alarm sounds

D. RB Purge fan trips AND 3PR-2 thru 3PR-5 close

ILT39 ONS SRO NRC Examination QUESTION 60

60

B

General Discussion

Answer A Discussion

Incorrect and plausible. The valve closure part of this answer is correct. The second part is incorrect and plausible as this is an automatic function of RIA-45.

Answer B Discussion

Correct. RIA-49 High alarm causes an RB evacuation alarm and closes LWD-2.

Answer C Discussion

Incorrect and plausible. The first part is incorrect and plausible as this is an automatic function of RIA-45. The second part is correct as the RB Evacuation alarm will sound.

Answer D Discussion

Incorrect and plausible. Both of the actions would be correct if asking about RIA-45.

Basis for meeting the KA

Requires demonstrating the ability to monitor radiation levels in the control room by monitoring for automatic actions of associated radiation monitors used to indicate radiological problems in the RB that could occur if a spent fuel assembly were dropped,

Basis for Hi Cog

Requires analyzing plant conditions and determining the automatic actions that would occur based on the analysis.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
RAD-RIA R2	

SYS034 A4.01 - Fuel Handling Equipment System (FHES)
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)
Radiation levels .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 61

61

D

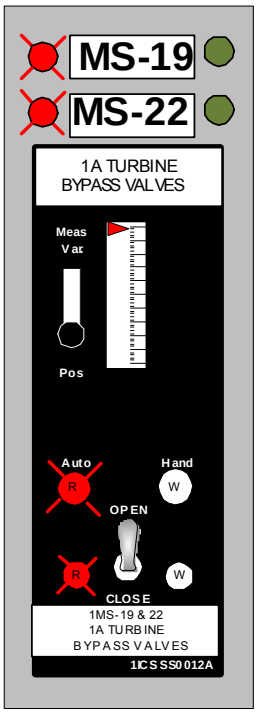
SYS041 A2.02 - Steam Dump System (SDS)/Turbine Bypass Control

Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

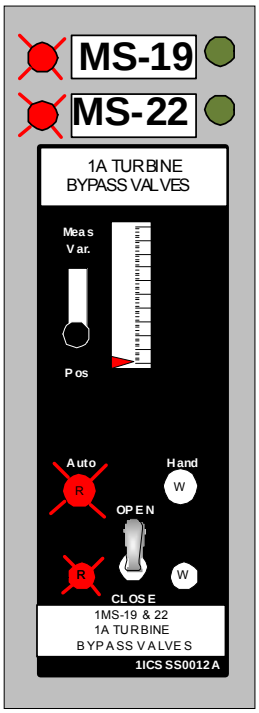
Steam valve stuck open .....

Given the two pictures below:

Picture X



Picture Y



1) Assuming NO operator actions, picture __(1)__ would be the expected indication five minutes following a spurious Unit 1 Reactor trip from 100% if the 1A TBV's mechanically stuck OPEN immediately following the trip.

2) The __(2)__ tab will be used to mitigate this failure.

Which ONE of the following completes the statements above?

A. 1. X
   2. Subsequent Actions

B. 1. X
   2. EHT

C. 1. Y
   2. Subsequent Actions

D. 1. Y
   2. EHT

General Discussion

The TBV bailey station is what is shown in the pictures. The lights above the bailey station are actual valve position lights fed from limit switches directly from the mechanical position of the valve. The window in the bailey station reads in % (0-100) and is an indication of valve demand not actual valve position. Following a reactor trip where the TBV's fail open, the setpoint being used by the TBV calls for maintaining 1010 psig. With the TBV failed open, actual SG pressure will begin to decrease and as pressure falls below 1010 psig, valve demand will begin to call for the valve to close. Within 2-3 minutes following the trip, SG pressure will be falling below 1010 and therefore valve demand will begin to approach 0%.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The actual valve positions are open and the demand window of the bailey station indicates 100% demand. These two indications show the valves responding as they are demanded and looks correct.

Second part is incorrect and plausible. Subsequent Actions does provide mitigation actions for a failed open Main Steam Relief Valve (but not a Turbine Bypass Valve).

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The actual valve positions are open and the demand window of the bailey station indicates 100% demand. These two indications show the valves responding as they are demanded and looks correct.

The second part is correct. The EHT tab will direct the operator to isolate the leak by closing the TBV block valve on the affected SG.

Answer C Discussion

Incorrect.

The first part is correct. The valve position lights above the bailey station would indicate open via the red lights illuminated and the green lights off while the pointer in the bailey window would indicate bottom of scale since it is valve demand and with SG pressure low due to the failed open valves, valve demand would be calling for the valve to close therefore would be bottom of scale.

Second part is incorrect and plausible. Subsequent Actions does provide mitigation actions for a failed open Main Steam Relief Valve (but not a Turbine Bypass Valve).

Answer D Discussion

Correct.

The first part is correct. The valve position lights above the bailey station would indicate open via the red lights illuminated and the green lights off while the pointer in the bailey window would indicate bottom of scale since it is valve demand and with SG pressure low due to the failed open valves, valve demand would be calling for the valve to close therefore would be bottom of scale.

The second part is correct. The EHT tab will direct the operator to isolate the leak by closing the TBV block valve on the affected SG.

Basis for meeting the KA

Requires predicting the impact of a failure of a TBV on the bailey station indications and requires determining which procedure will provide mitigation of the failure.

Basis for Hi Cog

Requires analyzing indications to determine which is consistent with given conditions and then requires knowledge of the major mitigation strategy of EOP tabs in order to chose the correct procedure path.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

Obj. STG-ICS R10
Subsequent Actions tab
EHT tab
STG-ICS chptr 3 & 6

Student References Provided

ILT39 ONS SRO NRC Examination QUESTION 61

61

D

SYS041 A2.02 - Steam Dump System (SDS)/Turbine Bypass Control

Ability to (a) predict the impacts of the following malfunctions or operations on the SDS; and (b) based on those predictions or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13)

Steam valve stuck open .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 62

62

B

SYS045 A3.11 - Main Turbine Generator (MT/G) System
Ability to monitor automatic operation of the MT/G system, including: (CFR: 41/7 / 45.5)
Generator trip .....

Given the following Unit 1 conditions:

- Reactor power = 100%

Which ONE of the following will have resulted in a trip of the Main Turbine/Generator?

A. Turbine speed = 1940 RPM

B. Bearing Oil Pressure = 7.5 psig

C. EITHER Steam Generator level = 90% OR

D. EHC Discharge Header Pressure = 1300 psig

ILT39 ONS SRO NRC Examination QUESTION 62

62

B

General Discussion

Answer A Discussion

Incorrect and plausible. The normal MT speed is 1800 RPM. The MT mechanical overspeed trip test has an acceptability band of 1980 rpm +18/-36 rpm. 1940 RPM is significantly greater than normal operating values but has not reached the minimum acceptable trip setpoint of 1946 RPM.

Answer B Discussion

Correct. Low Bearing Oil Pressure - incorporates 3 pressure switches and 2 out of 3 trip logic at <8 psig

Answer C Discussion

Incorrect and plausible. This value is above the 86% OR setpoint of High Level Limits on the SG's however it has not yet reached the MT trip setpoint of 96% OR.

Answer D Discussion

Incorrect and plausible. This is the value at which the Low EHC Discharge Header pressure statalarm actuates.

Basis for meeting the KA

Requires ability to monitor for an automatic trip of the Main Turbine.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
STG-EHC R10,23	

SYS045 A3.11 - Main Turbine Generator (MT/G) System

Ability to monitor automatic operation of the MT/G system, including: (CFR: 41/7 / 45.5)

Generator trip .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 63

63

B

SYS068 K5.04 - Liquid Radwaste System (LRS)

Knowledge of the operational implication of the following concepts as they apply to the Liquid Radwaste System: (CFR: 41.5 / 45.7)
Biological hazards of radiation and the resulting goal of ALARA .....

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1RIA-40 (CSAE Off-Gas Monitor) reading is rising slowly
- 1RIA-54 (Turbine Building (TB) Sump Monitor) is inoperable
- The operating crew has just entered AP/31 (Primary To Secondary Leakage) due to a 6 gpm leak in the 1A SG

1) In accordance with AP/31 an NEO is required to ___(2)___.

2) Emergency Dose Limits __(1)___in affect.

A. 1. open and white tag the TB Sump Pump breakers
   2. are

B. 1. open and white tag the TB Sump Pump breakers
   2. are NOT

C. 1. align the TB Sump to the TB Sump Monitor Tanks
   2. are

D. 1. align the TB Sump to the TB Sump Monitor Tanks
   2. are NOT

General Discussion

Answer A Discussion

Incorrect.

Part one is correct. AP/31 directs the two turbine building sump pumps breaker's be white tagged and open.

Part two is incorrect and plausible. The emergency Dose limits are in effect on a SG tube leak only if the SGTR EOP is in effect. At 6 gpm the AP is used so normal dose limits apply. The EOP is entered at >25 gpm.

Answer B Discussion

Correct.

Part one is correct. AP/31 directs the two turbine building sump pumps breaker's be white tagged and open.

Part two is correct.. The Emergency Dose Limits are in effect on a SG tube leak only if the SGTR EOP is in effect. At 6 gpm the AP is used so normal dose limits apply. The EOP is entered at >25 gpm.

Answer C Discussion

Incorrect.

Part one is incorrect and plausible. 1104/048 TB Sump Operation directs that if TB Sump sample results activity > 10 EC, TB Sump must be pumped to TB Sump
Monitor Tanks

Part two is incorrect and plausible. The emergency Dose limits are in effect on a SG tube leak only if the SGTR EOP is in effect. At 6 gpm the AP is used so normal dose limits apply. The EOP is entered at >25 gpm.

Answer D Discussion

Incorrect.

Part one is incorrect and plausible. 1104/048 TB Sump Operation directs that if TB Sump sample results activity > 10 EC, TB Sump must be pumped to TB Sump
Monitor Tanks

Part two is correct.. The emergency Dose limits are in effect on a SG tube leak only if the SGTR EOP is in effect. At 6 gpm the AP is used so normal dose limits apply. The EOP is entered at >25 gpm.

Basis for meeting the KA

Question requires knowledge of the process during a tube leak to ensure an unmonitored release does not occur. This is consistent with the ALARA goals. The distinction between normal and emergency dose limits is tested for knowledge of EOP/AP as it relates to leak size.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	

Development References

EAP-APG R9
AP/31
OP/0/A/1104/048
EAP-APG 031

Student References Provided

SYS068 K5.04 - Liquid Radwaste System (LRS)
Knowledge of the operational implication of the following concepts as they apply to the Liquid Radwaste System: (CFR: 41.5 / 45.7)
Biological hazards of radiation and the resulting goal of ALARA .....

ILT39 ONS SRO NRC Examination QUESTION 63

63

B

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 64

64

D

SYS075 K2.03 - Circulating Water System
Knowledge of bus power supplies to the following: (CFR: 41.7)
Emergency/essential SWS pumps .....

The C LPSW Pump is normally powered from __(1)__ and it __(2)__ have an alternate supply from another unit.

A. 1. 1TC
2. does

B. 1. 1TC
2. does NOT

C. 1. 2TC
2. does

D. 1. 2TC
2. does NOT

ILT39 ONS SRO NRC Examination QUESTION 64

64

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. Both the A and B LPSWP's normal power supply is from 1TC.

Second part is incorrect and plausible. The B LPSW pump does have the capability of being aligned to 2TD.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. Both the A and B LPSWP's normal power supply is from 1TC.

Second part is correct. C LPSW Pump does not have an alternate supply from Unit 1

Answer C Discussion

Incorrect.

First part is correct. The power supply for the C LPSW Pump is 2TC .

Second part is incorrect and plausible. The B LPSW pump does have the capability of being aligned to 2TD.

Answer D Discussion

Correct.

First part is correct. The power supply for the C LPSW Pump is 2TC .

Second part is correct. C LPSW Pump does not have an alternate supply from Unit 1.

Basis for meeting the KA

Requires knowledge of the bus power supplies for the Unit 1 and 2 LPSW pumps.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References

IC-ES R20
SSS-LPW R11

Student References Provided

SYS075 K2.03 - Circulating Water System
Knowledge of bus power supplies to the following: (CFR: 41.7)
Emergency/essential SWS pumps .....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 65

65

D

SYS086 K4.02 - Fire Protection System (FPS)
Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)
Maintenance of fire header pressure .....

Which ONE of the following is a function of HPSW-25, (EWST altitude valve)?

A. Automatically closes when the base HPSW pump stops.

B. Maintain HPSW system pressure when EWST level decreases.

C. Allows continuous HPSW pump operation without EWST overflow.

D. Allows continuous operation of the HPSW Jockey pump without EWST overflow.

ILT39 ONS SRO NRC Examination QUESTION 65

65

D

General Discussion

Answer A Discussion

Incorrect and plussible. HPSW-25 does not close on pump operation. Valve closes on tank level which will establish a DP across the valve.

Answer B Discussion

Incorrect and plausible. If the pressure on the system side of the Altitude Valve drops 2 psig below the tank side pressure, HPSW-25 will open allowing water to flow out of the EWST and into the common fire main header. When tank level drops due to DP across the valve, it will open and supply gravity flow to the HPSW system. The purpose is not to maintain pressure. HPSW system pressure will decrease as EWST level decreases.

Answer C Discussion

Incorrect and plausible. This is the correct operation of the Jockey pump not the HPSW pump. The jockey pump is normally running to supply the system base loads. If the HPSW pump is needed it will start on decreasing tank level.

Answer D Discussion

Correct HPSW-25 allows the jockey pump to supply system loads during normal system operation without overflow of the EWST while maintain system at proper design pressure..

Basis for meeting the KA

Required knowledge of how HPSW header pressure is maintained during normal operation.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
SSS-HPW R4	

SYS086 K4.02 - Fire Protection System (FPS)

Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7)

Maintenance of fire header pressure .....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 66

66

D

GEN2.1 2.1.42 - GENERIC - Conduct of Operations
Conduct of Operations
Knowledge of new and sepnt fuel movement procedures. (CFR: 41.10 / 43.7 / 45.13)

Given the following Unit 3 conditions:

- Reactor in MODE 6
- Refueling in progress

Which ONE of the following describes the MINIMUM Source Range NI requirements in accordance with OP/3/A/1502/007 (Operations Defueling/Refueling Responsibilities)?

A. ANY two source range NI's

B. ANY three source range NI's

C. Two Source Range NI's located in adjacent quadrants

D. Reactor Engineering must specify which two Source Range NI's are acceptable

---

ILT39 ONS SRO NRC Examination QUESTION 66

66

D

General Discussion

Answer A Discussion

Incorrect and plausible. The limits and precautions section of 1502/007 (Operations Defueling/Refueling Responsibilities) states "Any combination of two Source Range NI's may be used for defueling."

Answer B Discussion

Incorrect and plausible. There are 4 Source Range NI's available, it would be reasonable to conclude that we would have one more than is required so that refueling could continue with one of the Source Range NI's failed (Incorrect applying the single failure concept).

Answer C Discussion

Incorrect and plausible. The number of NI's stated is correct and it would be reasonable to conclude they would be required to be in adjacent quadrants so that their count rates would be expected to be similar allowing the operator to compare count rates and verify the NI's were functioning properly.

Answer D Discussion

Correct. Reactor Engineering must designate which two NIs are acceptable.

Basis for meeting the KA

Question requires knowledge of Operations defueling/refueling procedure limits and precautions.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
OP/1502/07 FH-FHS R20	

GEN2.1 2.1.42 - GENERIC - Conduct of Operations

Conduct of Operations

Knowledge of new and sepnt fuel movement procedures. (CFR: 41.10 / 43.7 / 45.13)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 67

67

B

GEN2.1 2.1.8 - GENERIC - Conduct of Operations
Conduct of Operations
Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)

Given the following Unit 1 conditions:

Initial conditions:
- Reactor power = 100%
- BOTH Main Feedwater Pumps trip

Current conditions:
- Reactor power = 57% slowly decreasing

1) The correct sequence of activities directed by Rule 1 (ATWS) is to __(1)__.

2) The direction given to the operator opening the CRD breaker is to __(2)__ Arc Flash PPE.

Which ONE of the following completes the statements above?

A.
1. align HPI injection from the BWST then dispatch an operator to open the CRD breakers
2. wear

B.
1. align HPI injection from the BWST then dispatch an operator to open the CRD breakers
2. NOT wear

C.
1. dispatch an operator to open the CRD breakers then align HPI injection from the BWST
2. wear

D.
1. dispatch an operator to open the CRD breakers then align HPI injection from the BWST
2. NOT wear

General Discussion

The RO will give specific direction to the outside operators for aligning HPI and tripping of the CRD breakers per Rule 1. The normal safety practice when opening a 600V breaker is to wear Arc Flash PPE. The seriousness of an ATWS event necessitates a timely response. It is important that the outside operator be directed NOT to wear PPE as this would be different from what he/she would normally do.

Answer A Discussion

Incorrect.

First part is correct. HPI is aligned prior to dispatching an operator to open the CRD breakers.

Second part is incorrect and plausible. The normal expectation is to wear Arc Flash PPE when operating a 600V breaker. Without the specific direction NOT to wear the PPE the outside operator may take unnecessary time to don this PPE.

Answer B Discussion

Correct.

First part is correct. HPI is aligned prior to dispatching an operator to open the CRD breakers.

Second part is correct. Rule 1 does have the control room operator direct the outside operator NOT to wear Arc Flash PPE.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. Opening the CRD breakers is an action directed by Rule 1 with the intent of remotely tripping the reactor. It is reasonable for the candidate to conclude the highest priority is to accomplish the reactor trip. Since opening the CRD breakers is done outside the control room and takes several minutes to accomplish it would be consistant with getting the reacotr tipped to go ahead and get someone dispatched to open the breakers prior to aligning HPI injection.

Second part is incorrect and plausible. The normal expectation is to wear Arc Flash PPE when operating a 600V breaker. Without the specific direction NOT to wear the PPE the outside operator may take unnecessary time to don this PPE.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. Opening the CRD breakers is an action directed by Rule 1 with the intent of remotely tripping the reactor. It is reasonable for the candidate to conclude the highest priority is to accomplish the reactor trip. Since opening the CRD breakers is done outside the control room and takes several minutes to accomplish it would be consistant with getting the reacotr tipped to go ahead and get someone dispatched to open the breakers prior to aligning HPI injection.

Second part is correct. Rule 1 does have the control room operator direct the outside operator NOT to wear Arc Flash PPE.

Basis for meeting the KA

Requires demonstrating the ability to dispatch an operator to locally open the CRD breakers during an ATWS event.

Basis for Hi Cog

Requires knowledge of the mitigation strategy employed by Rule 1 and then assessing plant conditions to determine which strategy is utilized.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EAP-UNPP R3 Rule 1	

GEN2.1 2.1.8 - GENERIC - Conduct of Operations

Conduct of Operations

Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)

ILT39 ONS SRO NRC Examination QUESTION 67

67

B

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 68

68

D

GEN2.2 2.2.22 - GENERIC - Equipment Control
Equipment Control
Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)

Given the following Unit 1 conditions:

- MODE 1
- RCS pressure = 2755 psig

The Technical Specification MINIMUM required action is to restore RCS pressure within limits ___(1)___.

Which ONE of the following completes the statement above?

A. within 5 minutes

B. within 15 minutes

C. and be in MODE 3 within 30 minutes

D. and be in MODE 3 within 1 hour

ILT39 ONS SRO NRC Examination QUESTION 68

68

D

General Discussion

Answer A Discussion

Incorrect and plausible. This is the required actions for the plant in MODES 3,4, and 5.

Answer B Discussion

Incorrect and plausible. The required action for the plant in Modes 3,4, and 5 is a very short time frame. Other TS require 15 minutes. Ex TS 3.1.1 Condition A.

Answer C Discussion

Incorrect and plausible. The time frame for the required action in this case is a short time. Other TS require 30 minutes. Ex TS 3.2.3 Condition B.

Answer D Discussion

Correct - This is the correct action for exceeding the RCS pressure safety limit of 2750 psig in MODE 1 or 2.

Basis for meeting the KA

Question requires knowledge of the TS RCS pressure safety limit.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
TS 2.1.2 (RCS Pressure Safety Limit)	

GEN2.2 2.2.22 - GENERIC - Equipment Control

Equipment Control

Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)

401-9 Comments:	Remarks/Status
	New KA G2.2.22

ILT39 ONS SRO NRC Examination QUESTION 69

69

B

GEN2.2 2.2.7 - GENERIC - Equipment Control
Equipment Control
Knowledge of the process for conducting special or infrequent tests. (CFR: 41.10 / 43.3 / 45.13)

Which ONE of the following describes two (2) evolutions or tests that have pre-planned pre-job briefs per NSD 213 (Risk Management Process), Infrequently Performed Tests or Evolutions?

A. Unit 2 Mid-Loop Operations and Turbine Stop Valve Movement Test

B. Unit 2 Mid-Loop Operations and Zero Power Physics Testing

C. Placing a new demineralizer in service and Turbine Stop Valve Movement Test

D. Placing a new demineralizer in service and Zero Power Physics Testing

---

General Discussion

Evolutions that are seldom performed even though covered by existing normal or abnormal procedures (for example, plant startup after a prolonged outage or after any outage that involves significant changes to systems, equipment, or procedures related to the core, reactivity control, or reactor protection)

Answer A Discussion

Incorrect.

First part is correct. Per NSD-213 (Risk Management Process) and detailed in OMP 1-22 (Pre-job and Post-job Briefs) , Mid-loop Operations is listed/meet the criteria for an Infrequently Performed Test/Evolution

Second part is incorrect and plausible. A Turbine Stop Valve Movement Test does include significant reactivity changes and is only performed quarterly therefore it is reasonable to concllude meets the criteria of NSD 213 as follows:

Answer B Discussion

Correct.

First part is correct. Per NSD-213 (Risk Management Process) and detailed in OMP 1-22 (Pre-job and Post-job Briefs) , Mid-loop Operations is listed/meet the criteria for an Infrequently Performed Test/Evolution

Second part is correct. Per NSD-213 (Risk Management Process) and detailed in OMP 1-22 (Pre-job and Post-job Briefs) , Zero Power Physics Testing is listed/meet the criteria for an Infrequently Performed Test/Evolution

Answer C Discussion

Incorrect:

First part is incorrect and plausible. Placing a new demineralizer in service does include the potential of significant reactivity changes and is not performed regularly therefore it is reasonable to conclude it meets the criteria of NSD 213 as follows:

Second part is incorrect and plausible. A Turbine Stop Valve Movement Test does include significant reactivity changes and is only performed quarterly therefore it is reasonable to concllude meets the criteria of NSD 213 as follows:

Answer D Discussion

Incorrect.

First part is incorrect and plausible. Placing a new demineralizer in service does include the potential of significant reactivity changes and is not performed regularly therefore it is reasonable to conclude it meets the criteria of NSD 213 as follows:

Second part is correct. Per NSD-213 (Risk Management Process) and detailed in OMP 1-22 (Pre-job and Post-job Briefs) , Zero Power Physics Testing is listed/meet the criteria for an Infrequently Performed Test/Evolution

Basis for meeting the KA

Required knowledge of pre-determined Pre-job briefs based on evolutions classified as Infrequently Performed Tests or Evolutions.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References

OMP 1-22
ADM-OMP R28
NSD 213

Student References Provided

GEN2.2 2.2.7 - GENERIC - Equipment Control
Equipment Control
Knowledge of the process for conducting special or infrequent tests. (CFR: 41.10 / 43.3 / 45.13)

ILT39 ONS SRO NRC Examination QUESTION 69

69

B

401-9 Comments:	Remarks/Status
	Low miss rate on 2009 NRC

ILT39 ONS SRO NRC Examination QUESTION 70

70

D

GEN2.3 2.3.11 - GENERIC - Radiation Control
Radiation Control
Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)

Given the following Unit 3 conditions:

- 3A GWD gas tank release in progress
- Release is at 2/3 Station Limit

1) 1RIA-45 High and Alert setpoints will be set at __(1)__ those listed in PT/0/A/230/001 (Radiation Monitor Check).

2) If 1RIA-45 High alarm setpoint is reached, the 3A GWD gas tank release __(2)__.

Which ONE of the following completes the statements above?

A. 1. double
   2. will automatically terminate

B. 1. double
   2. must be manually terminated

C. 1. half
   2. will automatically terminate

D. 1. half
   2. must be manually terminated

ILT39 ONS SRO NRC Examination QUESTION 70

70

D

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. Per PT/0/A/230/001the non-releasing unit's RIA-45 setpoint is double that of the releasing unit's.

Second part is incorrect and plausible. The station release limit could be exceeded and the other unit's RIA-45 have a high alarm. The release will be automatically terminated if the RIA-37 setpoint is exceed on the releasing unit. Therefore it is resonable to conclude a High alarm on the 1RIA-45 would trigger an automatic termination of the release.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. Per PT/0/A/230/001the non-releasing unit's RIA-45 setpoint is double that of the releasing unit's.

Second part is correct. Per OP/3/A/1104/018 (GWD System) if RIA-45 High alarm actuates on a non-releasing unit, the other unit must be notified to manually terminate the release. RIA-37/38 are the process monitors that are interlocked to terminate the release.

Answer C Discussion

Incorrect.

First part is correct. Per PT/0/A/230/001 (Radiation Monitor Check) the setpoint on the non-releasing unit is set at half the value in the PT.

Second part is incorrect and plausible. The station release limit could be exceeded and the other unit's RIA-45 have a high alarm. The release will be automatically terminated if the RIA-37 setpoint is exceed on the releasing unit. Therefore it is resonable to conclude a High alarm on the 1RIA-45 would trigger an automatic termination of the release.

Answer D Discussion

Correct.

First part is correct. Per PT/0/A/230/001 (Radiation Monitor Check) the setpoint on the non-releasing unit is set at half the value in the PT.

Second part is correct. Per OP/3/A/1104/018 (GWD System) if RIA-45 High alarm actuates on a non-releasing unit, the other unit must be notified to manually terminate the release. RIA-37/38 are the process monitors that are interlocked to terminate the release.

Basis for meeting the KA

Question requires knowledge of the process for releasing at 2/3 the station limit.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	

Development References

WE-GWD R6
OP/3/A/1104/018
PT/0/A/0230/001

Student References Provided

GEN2.3 2.3.11 - GENERIC - Radiation Control
Radiation Control
Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)

401-9 Comments:

Remarks/Status

Overlap and "D" not plausible.

ILT39 ONS SRO NRC Examination **QUESTION 70** 70 **D**

ILT39 ONS SRO NRC Examination QUESTION 71

71

D

GEN2.3 2.3.15 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.12 / 43.4 / 45.9)

Given the following Unit 1 conditions:

Initial conditions:

- Mode 5
- RB Purge in operation

Current conditions:

- Radiation levels in the RB increasing

Which ONE of the following describes the operation of the Unit Vent Radiation Monitors 1RIA-45 and 1RIA-46 when 1RIA-46 switchover acceptance range set point is reached?

1RIA-45 will read ____(1)____ and 1RIA-46 will provide ____(2)____.

A. 1. offscale high
   2. only alarm and unit vent radiation level indication

B. 1. offscale high
   2. the same interlock functions that RIA-45 performs

C. 1. ZERO
   2. only alarm and unit vent radiation level indication

D. 1. ZERO
   2. the same interlock functions that RIA-45 performs

General Discussion

Answer A Discussion

Incorrect,

First part is incorrect and plausible. 1RAI-45 is the Norm Vent gas process monitor and 1RAI-46 is the High Gas RIA. It is reasonable to conclude that when the radiation level is indicating on the High Gas RIA (switchover acceptance range setpoint is reached) that the normal range instrument would be at its maximum value.

Second part is incorrect and plausible. RIA-46 is a different detector and instrument string than RAI-45. RAI-46 should not trigger the interlocks associated with RAI-45 if RAI-45 operates correctly. Therefore it is reasonable to conclude that RAI-46 has only alarm and indication functions.

Answer B Discussion

Incorrect,

First part is incorrect and plausible. 1RAI-45 is the Norm Vent gas process monitor and 1RAI-46 is the High Gas RIA. It is reasonable to conclude that when the radiation level is indicating on the High Gas RIA (switchover acceptance range setpoint is reached) that the normal range instrument would be at its maximum value

Second part is correct. RIA-46 will provide the same interlock functions as RIA-45 (which would include tripping Purge fans and closing Purge valves).

Answer C Discussion

Incorrect,

First part is correct. RIA-45 will read zero

Second part is incorrect and plausible. RIA-46 is a different detector and instrument string than RAI-45. RAI-46 should not trigger the interlocks associated with RAI-45 if RAI-45 operates correctly. Therefore it is reasonable to conclude that RAI-46 has only alarm and indication functions.

Answer D Discussion

Correct,

First part is correct. RIA-45 will read zero

Second part is correct. RIA-46 will provide the same interlock functions as RIA-45 (which would include tripping Purge fans and closing Purge valves).

Basis for meeting the KA

Requires knowledge of 1RIA-45 & 46 interrelation, automatic actions and indications on increasing Radiation levels

Basis for Hi Cog

Requires assessing the impact of a loss of power to a portion of the RIA monitoring system then applying system knowledge to determine the consequences of the loss of power.

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	

Development References	Student References Provided
RAD-RIA R15	

GEN2.3 2.3.15 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (CFR: 41.12 / 43.4 / 45.9)

ILT39 ONS SRO NRC Examination

QUESTION 71

71

D

401-9 Comments:

Remarks/Status
Overlap with 51. new bank question,

ILT39 ONS SRO NRC Examination QUESTION 72

72

B

GEN2.3 2.3.7 - GENERIC - Radiation Control

Radiation Control

Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

---

1) The required response by an NEO performing Primary rounds to an Electronic Dosimeter dose alarm is to __(1)__.

2) It is acceptable to deviate from the above requirements __(2)__.

Which ONE of the following completes the statements above?

A. 1. exit the area immediately and contact RP
   2. with RP permission

B. 1. exit the area immediately and contact RP
   2. when emergency dose limits are in effect

C. 1. move away from the area until alarm clears
   2. with RP permission

D. 1. move away from the area until alarm clears
   2. when emergency dose limits are in effect

ILT39 ONS SRO NRC Examination QUESTION 72

72

B

General Discussion

Answer A Discussion

Incorrect:

First part is correct. Per RAD-RPP page 59, if your dose alarm activates, exit the area and contact RP.

Second part is incorrect and plausible. RP permission is required to make a temporary change to an RWP requirement and provides other radiological guidance to operators. However RP cannot authorize personnel to continue work with a continuous dose alarm. RAD-RPP.

Answer B Discussion

Correct.

First part is correct. Per RAD-RPP page 59, if your dose alarm activates, exit the area and contact RP.

Second part is correct. Per OMP 1-18 page 20 when EDL's are implemented NEO's and others working under EDL's may continue to work through ED alarms.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. Just moving away from the area will allow the alarm to clear.

Second part is incorrect and plausible. RP permission is required to make a temporary change to an RWP requirement and provides other radiological guidance to operators. However RP cannot authorize personnel to continue work with a continuous dose alarm. RAD-RPP.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. Just moving away from the area will allow the alarm to clear.

Second part is correct. Per OMP 1-18 page 20 when EDL's are implemented NEO's and others working under EDL's may continue to work through ED alarms.

Basis for meeting the KA

Requires knowledge of how to respond to Dose and Dose Rate alarms determined by RWP's in both normal and abnormal conditions. Additionally requires knowledge of when it is acceptable under abnormal conditions to deviate from the RWP requirements

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2009A NRC exam Q73

Development References

Q72 2009A RO Q73
RAD-RPP R9
OMP 1-18
EAP-TCA R6

Student References Provided

GEN2.3 2.3.7 - GENERIC - Radiation Control
Radiation Control
Ability to comply with radiation work permit requirements during normal orabnormal conditions. (CFR: 41.12 / 45.10)

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 72

72

B

ILT39 ONS SRO NRC Examination QUESTION 73

73

C

GEN2.4 2.4.34 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 3 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Chlorine gas is entering the Control Room due to an accidentally dropped cylinder.
- The SRO has implemented AP/08 (Loss of Control Room).

1) The RO will go to the __(1)__.

2) Bank 2 Groups __(2)__ Pzr heaters will be used to control RCS pressure from this location.

Which ONE of the following completes the statements above?

A. Standby Shutdown Facility

B and D

B. Standby Shutdown Facility

B and C

C. Unit 3 Auxiliary Shutdown Panel

B and D

D. Unit 3 Auxiliary Shutdown Panel

B and C

ILT39 ONS SRO NRC Examination QUESTION 73

73

C

General Discussion

Chlorine gas cylinders are stored on site per CP/0/B/4002/011 as part of the Chlorine feed system. Per this procedure a chlorine leak >/= 0.5 ppm is reported to the control room.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. The Standby Shutdown Facility is used for a fire that results in the loss of the control room.

Second part is correct. The ASDP uses PZR heater Bank 2 Groups B and D for RCS pressure control.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. The Standby Shutdown Facility is used for a fire that results in the loss of the control room.

Second part is incorrect and plausible. PZR heater Group 2 Banks B and C are controlled from the SSF which would be used If the evacuation was due to a fire.

Answer C Discussion

Correct.

First part is correct. AP/008 directs going to the ASDP when evacuating the control room for any condition other than a fire.

Second part is correct. The ASDP uses PZR heater Bank 2 Groups B and D for RCS pressure control.

Answer D Discussion

Incorrect.

First part is correct. AP/008 directs going to the ASDP when evacuating the control room for any condition other than a fire.

Second part is incorrect and plausible. PZR heater Group 2 Banks B and C are controlled from the SSF which would be used If the evacuation was due to a fire.

Basis for meeting the KA

Question requires knowledge of RO action outside of the CR during an emergency and how RCS pressure will be controlled by that RO.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

Development References

IC-ASP R3
EAP-SSF R10
3AP/08

Student References Provided

GEN2.4 2.4.34 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

Remarks/Status

New KA??? Other than the SRO requirement for EPLAN classification ???
New KA G2.4.34

Chlorine gas onsite? Per EHS we do.

ILT39 ONS SRO NRC Examination QUESTION 73

73

C

Do not like second part.

ILT39 ONS SRO NRC Examination QUESTION 74

74

A

GEN2.4 2.4.39 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of RO responsibilities in emergency plan implementation. (CFR: 41.10 / 45.11)

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1SA3/B6 (FIRE ALARM) actuated
- Fire Alarm panel indication
  - point 0202071 (Unit 1 pipe trench room 348 north end) actuated

Which ONE of the following describes:

1) who will be dispatched to the Unit 1 pipe trench room 348 per the Alarm Response Guide to determine the validity of the alarm?

2) a method used in RP/1000/029 (Fire Brigade Response) to dispatch the fire brigade <u>when it is required</u>?

A. 1. A Fire Brigade qualified operator
   2. Plant Paging system

B. 1. A Fire Brigade qualified operator
   2. Have Security dispatch fire brigade

C. 1. The Unit 1 BOP Reactor Operator
   2. Plant Paging system

D. 1. The Unit 1 BOP Reactor Operator
   2. Have Security dispatch fire brigade

ILT39 ONS SRO NRC Examination QUESTION 74

74

A

General Discussion

Answer A Discussion

Correct.

First part is correct. Manual actions of ARG for Fire Alarm statalarm direct dispatching a fire brigade qualified operator to assess validity of the alarm.

Second part is correct. Attachment 2 is used to dispatch the fire brigade and the initial response is to use the plant page. This is significant since all fire brigade members do not have radios and pagers therefore the plant page is used to ensure all members are notified.

Answer B Discussion

Incorrect:

First part is correct. Manual actions of ARG for Fire Alarm statalarm direct dispatching a fire brigade qualified operator to assess validity of the alarm.

Second part is incorrect and plausible. Security is used to dispatch the MERT to a medical emergency per RP/1000/016 (MERT activation). It is reasonable to conclude security would also be used for fire events.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. The BOP is who is sent to the SSF when the SSF is activated and one of the purposes for the SSF is to protect from the consequences of a fire. However ROs are not fire brigade qualified.

Second part is correct. Attachment 2 is used to dispatch the fire brigade and the initial response is to use the plant page. This is significant since all fire brigade members do not have radios and pagers therefore the plant page is used to ensure all members are notified.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. The BOP is who is sent to the SSF when the SSF is activated and one of the purposes for the SSF is to protect from the consequences of a fire. However ROs are not fire brigade qualified.

Second part is incorrect and plausible. Security is used to dispatch the MERT to a medical emergency per RP/1000/016 (MERT activation). It is reasonable to conclude security would also be used for fire events.

Basis for meeting the KA

Question requires knowledge of RO responsibilities when implementing Emergency Response Procedure RP/1000/29 regarding dispatching Fire Brigade to respond to a fire.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2009A NRC exam Q75

Development References

Q74 2009A NRC Q75
1SA3/B6
RP/1000/029
IC-FDS R6

Student References Provided

GEN2.4 2.4.39 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of RO responsibilities in emergency plan implementation. (CFR: 41.10 / 45.11)

ILT39 ONS SRO NRC Examination QUESTION 74

74

A

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 75

75

B

GEN2.4 2.4.8 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 1 conditions:

Initial Conditions:

- Reactor power = 100%

Current conditions:

- 2SA-18/A-11 (Turbine BSMT Water Level Emergency High) actuates
- Turbine Building flood in progress

1) After the reactor is tripped this event will be mitigated by __(1)__.

2) If ALL Main and EFDW is lost the preferred method to remove decay heat is ___(2)___.

Which ONE of the following completes the statements above?

A. 1. AP/10 (Turbine Building Flood) and the EOP
   2. initiating HPI Forced Cooling

B. 1. AP/10 (Turbine Building Flood) and the EOP
   2. feeding with SSF or Station ASW

C. 1. the EOP ONLY
   2. initiating HPI Forced Cooling

D. 1. the EOP ONLY
   2. feeding with SSF or Station ASW

ILT39 ONS SRO NRC Examination QUESTION 75

75

B

General Discussion

Answer A Discussion

Incorrect.

First part is correct. AP/10 is used to mitigate the turbine building flood while the EOP is used for the required RX trip.

Second part is incorrect and plausible. It is reasonable to conclude that HPI F/C is preferable for core cooling over feeding the SGs with lake water.

Answer B Discussion

Correct.

First part is correct. AP/10 is used to mitigate the turbine building flood while the EOP is used for the required RX trip.

Second part is correct. Feeding with SSF or Station ASW is preferred over HPI F/C during a TBF per the EOP-TBF.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. EOP is always used to mitigate an event following a reactor trip.

Second part is incorrect and plausible. It is reasonable to conclude that HPI F/C is preferable for core cooling over feeding the SGs with lake water.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. EOP is always used to mitigate an event following a reactor trip.

Second part is correct. Feeding with SSF or Station ASW is preferred over HPI F/C during a TBF per the EOP-TBF.

Basis for meeting the KA

Question requires knowledge of how AP/10 and the EOP are used in conjunction to mitigate a TB flood.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

Development References	Student References Provided
EAP-TBF R2 R3 EOP-TBF	

GEN2.4 2.4.8 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:	Remarks/Status