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- Group 2 rod 6 position = 58% withdrawn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.

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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

EAP-SA R1

Student References Provided

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

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

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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

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
TA-AM1 R16

Student References Provided

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

ILT39 ONS SRO NRC Examination QUESTION 4 4 **D**

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

EOP-Rule 6 (HPI)

Student References Provided

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

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
EAP-APG R8.3, 8.4 AP/1

Student References Provided

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)

401-9 Comments:	Remarks/Status

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

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

EL-PSL R6

Student References Provided

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

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

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

PNS-PZR R5, R29
ONS 2009A RO Q7 Modified

Student References Provided

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…

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

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
EAP-SGTR EOP-SGTR

Student References Provided

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

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

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

EAP-BO R6
EL-EPD R14
EOP Encl. 5.38

Student References Provided

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

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
TA-AM1 R2, R3

Student References Provided

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

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

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

EL-DCD R4
1SA-04/E-6

Student References Provided

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

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

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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

EAP-APG R9
AP/16 Encl. 5.1

Student References Provided

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

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

IC-ES R3
EL-EPD R18

Student References Provided

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...

401-9 Comments:	Remarks/Status

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
EAP-EOP LOHT Attachment 1 Rule 3

Student References Provided

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

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

EAP-LOSCM R5
EOP Rule 8

Student References Provided

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

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

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

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

IC-RCI R1
PNS-PZR R31

Student References Provided

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

fixed

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

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

EL-VPC R5
IC-NI

Student References Provided

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

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

CH-RC R10
AP/21

Student References Provided

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%.

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

STG-ICS R33

Student References Provided

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.

401-9 Comments:	Remarks/Status

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

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

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
EL-KHG R11, R18

Student References Provided

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.

401-9 Comments:	Remarks/Status

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

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

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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

EAP-LOSM Att. R7
EOP Rules

Student References Provided

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

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

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

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

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
PNS-HPI R5, R40

Student References Provided

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 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 <u>initially</u> 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	Student References Provided
PNS-HPI R10 CP-018 R1 1103 004	

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

PNS-LPI R16
ONS 2009A RO Q 32 Modified

Student References Provided

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.

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

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A

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)

CVCS ....

401-9 Comments:	Remarks/Status

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

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 ruptures 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

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

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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

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

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

PNS-CC R5
OP/1/A/1104/008

Student References Provided

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

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

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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

PNS-PZR R30

Student References Provided

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

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

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

ILT39 ONS SRO NRC Examination QUESTION 38 38 **D**

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

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

IC-ES R2, R5, R12
ONS 2009A RO Q#40

Student References Provided

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

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

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

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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

PNS-BS R16
IC-ES R20

Student References Provided

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

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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

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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

STG-MSR R18

Student References Provided

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 43 43 **C**

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

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

EAP-APG R9
AP/29

Student References Provided

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 **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 ....

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

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

STG-015 R26
3AP/34

Student References Provided

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

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

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
IC-RPS R16, R5.6

Student References Provided

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

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

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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
EL-CB R5

Student References Provided

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

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

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 ....

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B

401-9 Comments:	Remarks/Status
	Can't write discriminatory question on this KA. New KA 064A1.03 Change second part - high miss rate

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 ....

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

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	Student References Provided
EL-KHG R24 SLC 16.8.4	

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

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

RAD-RIA R16
SLC 16.11.3,
AP/18

Student References Provided

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 ....

401-9 Comments:	Remarks/Status
	Ref links

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

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

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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
SSS-LPW R14

Student References Provided

SYS076 A3.02 - Service Water System (SWS)

Ability to monitor automatic operation of the SWS, including: (CFR: 41.7 / 45.5)

Emergency heat loads ....

401-9 Comments:	Remarks/Status

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 increased 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 ....

401-9 Comments:	Remarks/Status

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

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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

PNS-RBP R5, R7
IC-RIA R2

Student References Provided

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

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

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

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

ILT39 ONS SRO NRC Examination QUESTION 58 58 **C**

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

---

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)

401-9 Comments:	Remarks/Status

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

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

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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

RAD-RIA R2

Student References Provided

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:

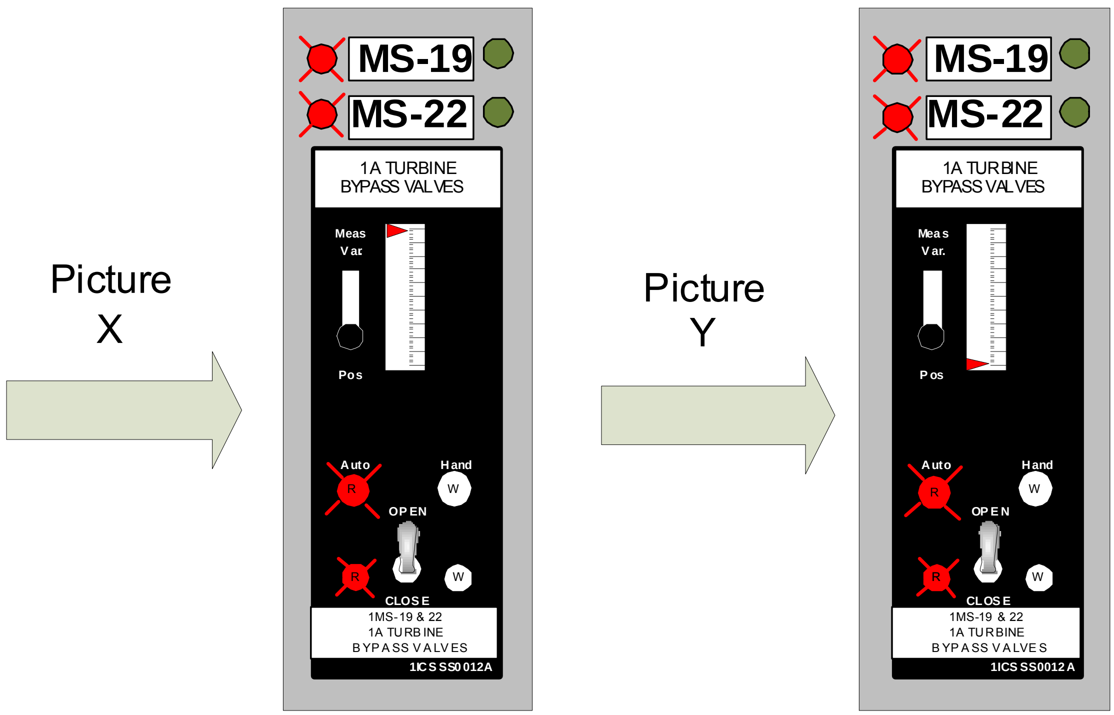
Remarks/Status

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:



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

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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

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

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

STG-EHC R10,23

Student References Provided

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

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

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

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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

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.

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

SSS-HPW R4

Student References Provided

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

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

---

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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

OP/1502/07
FH-FHS R20

Student References Provided

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

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
EAP-UNPP R3 Rule 1

Student References Provided

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

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

TS 2.1.2 (RCS Pressure Safety Limit)

Student References Provided

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

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ILT39 ONS SRO NRC Examination QUESTION 69

69

B

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

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.

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

RAD-RIA R15

Student References Provided

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)

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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 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.

Do not like second part.

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
  - o 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

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

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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

EAP-TBF R2 R3
EOP-TBF

Student References Provided

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

EPE007 EA2.02 - Reactor Trip

Ability to determine or interpret the following as they apply to a reactor trip: (CFR 41.7 / 45.5 / 45.6)

Proper actions to be taken if the automatic safety functions have not taken place ....

Given the following Unit 1 conditions:

Initial conditions:

- Reactor power = 100%

Current conditions:

- Core SCM = 0°F stable
- RCS pressure = 1050 psig stable
- 1A and 1B HPI pump operating
- 1HP-409 failed closed
- LOSCM tab in progress

1) The actions required by the LOSCM tab are to initiate feed to both SGs at the maximum allowable rate using ___(1)___ and depressurize both SGs.

2) The bases for these actions are to ___(2)___.

Which ONE of the following completes the statements above?

A. 1. Main and Emergency feedwater
   2. decrease RCS pressure to increase HPI flow and allow CFT and LPI to inject into the RCS

B. 1. Main and Emergency feedwater
   2. maximize primary to secondary heat transfer to remove enough decay heat so that available HPI can subcool the RCS

C. 1. Emergency feedwater ONLY
   2. decrease RCS pressure to increase HPI flow and allow CFT and LPI to inject into the RCS

D. 1. Emergency feedwater ONLY
   2. maximize primary to secondary heat transfer to remove enough decay heat so that available HPI can subcool the RCS

General Discussion

Question requires determining the correct actions to take during an ATWS once reactor power is below 1% and Tave is above 555. Tave is high because of the loss of main feedwater (EFDW is not adequate to remove heat from significant power production) and the UNPP tab will direct taking actions to get Tave back below 555 and the proper level established in the SG's.

Answer A Discussion

Incorrect.

First part is incorrect and plausible. It is reasonable to assume that all available FDW sources would be used with degraded HPI. This is true in the TB Flood tab of the EOP.

Second part is correct.

Answer B Discussion

Incorrect.

First part is incorrect and plausible. It is reasonable to conclude that stabilizing RCS temperature is desirable. For most transient the initial response is to stabilize the plant.

Second part is incorrect and plausible. It is plausible to conclude that rapidly cooling down would allow HPI to remove decay heat as is done in the HPI CD tab of the EOP..

Answer C Discussion

Correct.

First part is correct. Per the LOSCM tab, with degraded HPI the SGs are filled to the LOSCM Setpoint with EFDW.

Second part is correct. The bases for the rapid cool down is to decrease RCS pressure which will allow more HPI flow and allow the unit to start LPI cooling sooner.

Answer D Discussion

Incorrect.

First part is correct.

Second part is incorrect and plausible. It is plausible to conclude that rapidly cooling down would allow HPI to remove decay heat as is done in the HPI CD tab of the EOP..

Basis for meeting the KA

A reactor trip has occurred due to a LOCA and part of the HPI (safety system) has not functioned correctly. Question requires knowledge of required action based on these failures.

Basis for Hi Cog

Requires evacuating plant conditions to determine a correct mitigation strategy.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question requires knowledge of the bases for specfic actions taken in the EOP.

This question cannot be answered based solely on systems knowledge.
This knowledge not based on knowing entry conditions.
This knowledge is not major mitigation strategy of the tab.
This knowledge not based on knowing entry conditions.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References	Student References Provided
EAP-LOSCM r17 EOP LOSCM tab	

ILT39 ONS SRO NRC Examination QUESTION 76

76

C

EPE007 EA2.02 - Reactor Trip

Ability to determine or interpret the following as they apply to a reactor trip: (CFR 41.7 / 45.5 / 45.6)

Proper actions to be taken if the automatic safety functions have not taken place ....

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 77 77 **D**

EPE009 2.4.18 - Small Break LOCA
EPE009 GENERIC
Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

Given the following Unit 1 conditions:

Initial conditions:
- LOCA CD tab in progress
- All SCM's = 0°F stable
- RCS pressure = 1056 psig slowly decreasing

Current conditions:
- RCS pressure 1150 psig slowly increasing
- Reactor Vessel head level = 170" slowly decreasing
- 1A Hot Leg level = 513" slowly decreasing

1) The __(1)__ are required to be opened in accordance with the LOCA CD tab.

2) The bases for opening these valves is to __(2)__.

Which ONE of the following completes the statements above?

A. 1. Reactor Vessel head vents
 2. vent non-condensable gases to enhance natural circulation

B. 1. Reactor Vessel head vents
 2. depressurize the RCS and therefore increase HPI injection

C. 1. 1A Hot Leg vents
 2. vent non-condensable gases to enhance natural circulation

D. 1. 1A Hot Leg vents
 2. depressurize the RCS and therefore increase HPI injection

---

ILT39 ONS SRO NRC Examination QUESTION 77 77 **D**

General Discussion

Question is based on the premise of doing a saturated Natural Circulation cooldown due to a large RCS leak. During the cooldown enough voiding occurs so that Natural Circ flow is blocked by the voiding in the hot legs and therefore RCS pressure would begin to increase. When that occurs (based on Hot Leg level being < 537" and RCS pressure increasing) the Hot Leg vents are opened to decrease RCS pressure and therefore increase HPI flow to increase the liquid inventor and restore Natural Circ flow.

Answer A Discussion

Incorrect.

The first part is incorrect and plausible. The head vents are always opened when doing a subcooled Natural Circ cooldown. Additionally, they would be opened during this saturated Natural Circ cooldown if head level decreased below 163".

Second part is incorrect and plausible. Enhanced cooling of the RV head material is the reason that the RV head vents are opened during a subcooled Natural Circ cooldown.

Answer B Discussion

Incorrect.

The first part is incorrect and plausible. The head vents are always opened when doing a subcooled Natural Circ cooldown. Additionally, they would be opened during this saturated Natural Circ cooldown if head level decreased below 163".

Second part is correct. The reason that the vents are opened is to decrease RCS pressure which will increase HPI injection flow thereby restoring hot leg level to > 537" and restoring Natural Circ flow.

Answer C Discussion

Incorrect.

First part is correct. The hot leg vents are opened if a sustained RCS repressurization occurs and hot leg level decreases below 537".

Second part is incorrect and plausible. Enhanced cooling of the RV head material is the reason that the RV head vents are opened during a subcooled Natural Circ cooldown.

Answer D Discussion

Correct.

First part is correct. The hot leg vents are opened if a sustained RCS repressurization occurs and hot leg level decreases below 537".

Second part is correct. The reason that the vents are opened is to decrease RCS pressure which will increase HPI injection flow thereby restoring hot leg level to > 537" and restoring Natural Circ flow.

Basis for meeting the KA

The KA requires specific knowledge of EOP bases. This question requires specific knowledge of the bases of EOP actions directed during a saturated natural circ cooldown that is occurring due to a SBLOCA where RCS voiding has decreased loop levels to the level of preventing natural circulation flow. Discussed KA with Chief Examiner and he stated bases for action in the EOP would be an acceptable KA match.

Basis for Hi Cog

HI cog based on the requirement to analyze plant conditions and determine a course of action based on those conditions.

Basis for SRO only

This question requires knowledge of the basis for specific step in the EOP. The question cannot be answered solely on overall mitigation strategy on the LOCA CD tab of the EOP.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References	Student References Provided
EAP-LCD R5 EOP LOCA CD	

EPE009 2.4.18 - Small Break LOCA
EPE009 GENERIC
Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 78 78 **C**

BWE04 EA2.1 - Inadequate Heat Transfer
Ability to determine and interpret the following as they apply to the (Inadequate Heat Transfer)
(CFR: 43.5 / 45.13)
Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Given the following Unit 1 conditions:

Initial conditions:

- Reactor trip from 100% power
- Both Main Feedwater pumps trip
- EFDW pumps do NOT start

Current conditions:

- Rule 3 in progress
- LOHT tab initiated
- ALL SCM's > 0°F

Which ONE of the following describes a condition that will result in a transfer out of the LOHT tab?

A. Pressurizer level = 285 inches

B. Condensate Booster Pump feed is established

C. RCS pressure decreases and results in "A" Loop SCM = 0°F

D. HPI Forced Cooling is established through the "B" HPI Train ONLY

General Discussion

Answer A Discussion

Incorrect and plausible. The LOHT tab does allow transfer out when pressurizer level reaches 375" and Rule 4 is acceptable. Pressurizer level of 285 inches is the LCO for Pressurizer Operability.

Answer B Discussion

Incorrect and plausible. Once CBP feed is established it is reasonable to conclude that you no longer have a loss of heat transfer however the LOHT tab would require holding at the current steps until a more stable source (EFDW or MFDW) of cooling water is established

Answer C Discussion

Correct: If any SCM = 0 for reasons other than heating up then a transfer to LOSCM is made.

Answer D Discussion

Incorrect and plausible. It is reasonable to conclude that once any HPI is being injected into the RCS that a LOHT no longer exists and a transfer out is acceptable. If HPI forced cooling flow were established in both trains you would transfer out of the LOHT tab to the HPI CD tab.

Basis for meeting the KA

Must determine plant conditions and select correct procedure path required based on those conditions.

Basis for Hi Cog

Requires analyzing plant data and determineng the correct section of the EOP that would be used based on the analysis.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO as it requires assessing plant conditions and determining when transfer out of the LOHT tab is required.

This question cannot be answered based solely on systems knowledge.
This knowledge not based on knowing entry conditions.
This knowledge is not major mitigation strategy of the tab.
This knowledge not based on knowing entry conditions of the EHT tab.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	MODIFIED	ONS 2009A SRO Q#81

Development References

EOP LOHT Tab
ONS 2009A SRO Q#81
ONS TS 3.4.9
EOP Rules

Student References Provided

BWE04 EA2.1 - Inadequate Heat Transfer
Ability to determine and interpret the following as they apply to the (Inadequate Heat Transfer)
(CFR: 43.5 / 45.13)
Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

401-9 Comments:

Remarks/Status

RO part meets KA not SRO. Discuss with Mark
New KA :BWE04 EA2.1
New bank question.

APE040 AA2.01 - Steam Line Rupture

Ability to determine and interpret the following as they apply to the Steam Line Rupture: (CFR: 43.5 / 45.13)

Occurrence and location of a steam line rupture from pressure and flow indications ....

Given the following Unit 3 conditions:

Initial conditions:

- Reactor power = 100%
- 3A and 3B Main Steam pressure rapidly decreasing
- South end of turbine building is filling with steam

Current conditions:

- 3A and 3B Main Steam pressure = 985 psig increasing
- Steam in turbine building is decreasing

1) Assuming NO operator actions have occurred, the source of steam to the turbine building could be a steam line break located on the __(1)__.

2) An emergency classification __(2)__ required to be declared for this event in accordance with RP/O/B/1000/001 (Emergency Classification).

Which ONE if the following completes the statements above?

A. 1. Cold Reheat supply to the MSR's
   2. is

B. 1. Cold Reheat supply to the MSR's
   2. is NOT

C. 1. inlet side of 3MS-87 (MS To TD EFDWP Control)
   2. is

D. 1. inlet side of 3MS-87 (MS To TD EFDWP Control)
   2. is NOT

General Discussion

This question requires deducing where a MS line break is located based on indication of steam pressure and steam flow out of the break. Since the cold reheat supply is downstream of the MSSV's and the MS supply to the TD EFDWP is upstream of the MSSV's, you can determine which is the source of the steam break based on response of MS pressure.

Answer A Discussion

Correct.

First part is correct. Since the cold reheat lines are downstream of the MSSV's a MSLB located on the cold reheat line would be isolated when the MSSV's close. This would result in decreasing steam flow to the turbine building as well as both MS line pressures increasing back towards the 1010 psig setpoint of the TBV's. The steam break is isolated with the turbine trip.

Second part is correct. The steam line break was isolated the turbine tripped but the condition existed prior to the trip. The steam leak is the result of damaged plant equipment therefore an emergency classification is required.

Answer B Discussion

Incorrect.

First part is correct. Since the cold reheat lines are downstream of the MSSV's a MSLB located on the cold reheat line would be isolated when the MSSV's close. This would result in decreasing steam flow to the turbine building as well as both MS line pressures increasing back towards the 1010 psig setpoint of the TBV's. The steam break is isolated with the turbine trip.

Second part is incorrect and plausible. The EAL requires visible damage to the plant as a result of the steam line break relating to a Fire/Explosions and Security Actions. It is reasonable to conclude that since an automatic reactor trip terminated the EHT that an EAL is not applicable.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. Both steam lines are normally aligned to supply redundant sources of MS to 3MS-87 and therefore a break on the inlet side of 3MS-87 would result in both MS pressures decreasing however since the supply is upstream of the MSSV's it would not be isolated by the turbine trip.

Second part is correct. The steam line break was isolated the turbine tripped but the condition existed prior to the trip. The steam leak is the result of damaged plant equipment therefore an emergency classification is required.

Answer D Discussion

Incorrect.

First part is incorrect and plausible. Both steam lines are normally aligned to supply redundant sources of MS to 3MS-87 and therefore a break on the inlet side of 3MS-87 would result in both MS pressures decreasing however since the supply is upstream of the MSSV's it would not be isolated by the turbine trip.

Second part is incorrect and plausible. The EAL requires visible damage to the plant as a result of the steam line break relating to a Fire/Explosions and Security Actions. It is reasonable to conclude that since an automatic reactor trip terminated the EHT that an EAL is not applicable.

Basis for meeting the KA

This question requires using steam pressures and flows to determine the location of a MS line break and therefore matches the KA. The SRO portion also matches the KA since using the flow and pressure indications are required to determine the correct procedure path required to mitigate the event.

Basis for Hi Cog

Hi cog since it requires analyzing plant data to determine the source of the steam leak and required procedure path.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

The second part of this question is SRO as it requires assessing plant conditions and determining what procedure would be used to perform the plant cooldown. It requires determining the path through the EOP and therefore the internal transfers between the EHT tab and back to Subsequent actions (since neither SG was isolated) and then knowledge the Subsequent Actions will direct using the normal shutdown procedure to perform the cooldown to LPI.

This question cannot be answered based solely on systems knowledge.
This knowledge not based on knowing entry conditions.
This knowledge is not major mitigation strategy of the tab.
This knowledge not based on knowing entry conditions of the EHT tab.

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79

A

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References
STG-MS R17, R24 EAP-EHT R3 MS drawing EHT tab

Student References Provided

APE040 AA2.01 - Steam Line Rupture

Ability to determine and interpret the following as they apply to the Steam Line Rupture: (CFR: 43.5 / 45.13)

Occurrence and location of a steam line rupture from pressure and flow indications ....

401-9 Comments:

Remarks/Status
KA at SRO level - Mark

ILT39 ONS SRO NRC Examination QUESTION 80 80 **D**

APE058 2.2.22 - Loss of DC Power
APE058 GENERIC
Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)

Given the following plant conditions:

Initial conditions:
- All 3 units have performed an LCO 3.0.3 required shutdown to MODE 5
- The issue requiring shutdown has been resolved
- All 3 units are beginning their return to power
- Unit 1 is in MODE 5
- Unit 2 is in MODE 3
- Unit 3 is in MODE 3

Current conditions:
- 1DIC panel board becomes NOT operable

Which ONE of the following describes the impact on MODE changes in accordance with Tech Specs?

A. There are no restrictions on MODE changes for any unit

B. Unit 1 ONLY is prohibited from entering its next higher MODE

C. Units 1 and 2 ONLY are prohibited from entering their next higher MODE

D. Units 1, 2, and 3 are prohibited from entering their next higher MODE

ILT39 ONS SRO NRC Examination QUESTION 80

80

D

General Discussion

This question is testing 2 major things. The first is the understanding that all 3 units require that Unit 1's DIC panelboard be operable. That is true since 1DIC (and 1DID) supply control power for the SK and SL breakers. The other issue is how to apply the requuirements of LCO 3.0.4 which prohibits mode changes when an LCO is not met.

Answer A Discussion

Incorrect and plausible. There are two reasons for this answer being incorrect..
Since Unit 1 is in Mode 5 it would be reasonable to conclude that LCO 3.0.4 would not apply to any unit. Since the panelboard in question is on Unit 1 and Unit 1 is in Mode 5 (which is outside the Mode of applicability of TS 3.8.8) Unit 1 does not presently require 1DIC to be OPERABLE. Since the component is not currently required to be Operable on Unit 1, it is plausible to believe there are no restrictions on Mode changes.

Second, There are numerous cases in Tech Specs where there are Notes above the Actions table of an LCO that states that LCO 3.0.4 does not apply to that spec.

Answer B Discussion

Incorrect. Plausible since Unit 1 is prohibited from entering the Mode of Applicability of Tech Spec 3.8.8 (Distribution Systems-Operating) since 1DIC is required in Modes 1, 2, 3, and 4. Since it is a Unit 1 component, it is also plausible to believe that only Unit 1 is affected by the inoperability.

Answer C Discussion

Incorrect. Plausible since there are several Tech Spec systems shared by Units 1 and 2 where a single inoperability of a component would affect both Unit 1 and 2 but not Unit 3. LPSW and ECCW are two such examples.

Answer D Discussion

Correct. Although 1DIC is a Unit 1 component, 1DIC and 1DID provide control power for parts of the emergency power system (specifically the SK and SL breakers). This means that regardless of the status of Unit 1, any Unit above MODE 5 requires 1DIC and 1DID be operable to meet the requirements of TS 3.8.8 (Distribution Systems - Operating) for the unit that is above MODE 5. LCO 3.0.4 prevents entering the Mode of applicability or changing to a higher mode within the Mode of applicability when an LCO is not met on the associated unit. Since increasing modes on Unit 1 would place it inside the Mode of applicability for TS 3.8.8 and Units 2 and 3 are already inside the Mode of applicability, All 3 units would be restricted from increasing Modes in this condition.

Basis for meeting the KA

This question requires knowledge of LCO requirements for all 3 units and the impact that a loss of a DC panelboard has on meeting that LCO as well as the impact on the ability of units to continue with a startup with the DC panelboard unavailable.

Basis for Hi Cog

Hi cog since it requires analyzing plant conditions, applying TS 3.8.8 LCO as well as LCO 3.0.4 to the given conditions.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Requires knowledge of and the ability to apply the requirements of generic Tech Spec LCO 3.0.4

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References
TS 3.8.8 LCO 3.0.4 ADM-ITS R8 ADM-TSS R2

Student References Provided

APE058 2.2.22 - Loss of DC Power
APE058 GENERIC
Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)

401-9 Comments:	Remarks/Status

APE062 2.1.20 - Loss of Nuclear Service Water
APE062 GENERIC
Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)

Given the following Unit 1 conditions:

- LPSW line break occurs
- AP/24 (Loss of LPSW) in progress
- A and B LPSW pumps secured as part of line break isolation
- C LPSW pump operating
- LPSW Header pressure decreased to 63 psig and is now stable
- All HPI pump motor bearing temperatures = 197°F slowly increasing

Which ONE of the following describes actions required in accordance with AP/24?

A. Align station ASW to HPI pump motor coolers

B. Ensure LPSW to RB Auxiliary Coolers has automatically isolated

C. Secure HPI pumps and Initiate AP/25 (SSF EOP) and align the SSF RCMUP

D. Secure HPI pumps and initiate AP/14 (Loss of Normal HPI Makeup and/or Seal Injection)

General Discussion

Answer A Discussion

Correct. If HPI pump motor bearing temperatures reach 195 degrees, AP/24 directs aligning Station Aux Service Water to supply cooling water to HPI pumps.

Answer B Discussion

Incorrect. Plausible since this would be done if LPSW pressure decreased to 18 psig. The LPSW to the RB Auc Coolers isolate at 18 psig.

Answer C Discussion

Incorrect. Plausible since there is a temperature limit at which the HPI pumps are secured. Although the HPIP motor bearing temperatures are elevated, securing the HPIP's is not required until 215 degrees. Additionally plausible since the SSF RCMUP is an alternate supply for RCP seal injection and is utilized when all HPI is lost if CC is lost as well.

Answer D Discussion

Incorrect. Plausible since there is a temperature limit at which the HPI pumps are secured. Although the HPIP motor bearing temperatures are elevated, securing the HPIP's is not required until 215 degrees. Additionally plausible since AP/14 entry conditions would be met if all HPIP's were secured.

Basis for meeting the KA

Question requires knowledge of criteria used to execute specific steps in AP/24 and also requires interpreting plant data to determine if the criteria has been met.

Basis for Hi Cog

Hi cog since it requires interpreting plant data to determine if requirements to execute specific steps in AP/24 are met.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO as it requires assessing plant conditions and determining a section of the procedure with which to proceed. It requires detailed knowledge of the specific criteria required in AP/24 to implement various sections of the procedure when mitigating a loss of LPSW..

This question cannot be answered based solely on systems knowledge.
This knowledge not based on knowing entry conditions.
This knowledge is not major mitigation strategy of the AP

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

AP/24
PNS-HPI
EAP-APG R9

Student References Provided

APE062 2.1.20 - Loss of Nuclear Service Water
APE062 GENERIC
Ability to interpret and execute procedure steps. (CFR: 41.10 / 43.5 / 45.12)

401-9 Comments:

Remarks/Status

APE037 2.4.41 - Steam Generator (S/G) Tube Leak
APE037 GENERIC
Knowledge of the emergency action level thresholds and classifications. (CFR: 41.10 / 43.5 / 45.11)

Given the following Unit 1 conditions:

1200:
- Unit shutting down due to a 30 gpm tube leak in "1A" SG

1203:
- Unit trips due to a "1B" main steam line break outside the reactor building
- CT-1 and CT-4 lockouts occur when the unit trips

1207:
- Pressurizer level off scale low
- Loop and Core SCM = 0°F

1216:
- Power restored via CT-5
- RCP seals being supplied by the SSF RCMUP

1225:
- Loop A & B SCM = 13°F; core SCM = 10°F
- Pressurizer level = 100 inches and stable
- RC makeup flow = 200 gpm stable
- CETCs = 490°F stable

PRESENT TIME: 12:25

Assume no additional failures occur and that Emergency Coordinator Judgment is NOT used as a reason for classification.

1) The emergency classification at 1203 is _____________.

2) The emergency classification at 1225 is _____________.

Which ONE of the following completes the statements above?

A. 1. UNUSUAL EVENT
   2. ALERT

B. 1. UNUSUAL EVENT
   2. SITE AREA EMERGENCY

C. 1. ALERT
   2. ALERT

D. 1. ALERT
   2. SITE AREA EMERGENCY

ILT39 ONS SRO NRC Examination QUESTION 82

82

B

General Discussion

Answer A Discussion

Incorrect. First part is correct. Second part is plausible if do not realize that a path to the environment exists.

Answer B Discussion

Correct.

At 1203 the classification is an Unusual event based on identified RC leakage > 25 gpm.

At 1225 the classification is a Site Area Emergency due to the Fisson Product Barrier Matrix. 4 points for SGTR > 160 gpm + 3 points for Failure of secondary side of SG
results in a direct opening to the environment with SG Tube Leak ≥ 10 gpm in the SAME SG.

Answer C Discussion

Incorrect. Plausible if they believe the orginal SGTR and MSLB results in 4 points. Second part is plausible if do not realize that a path to the environment exists.

Answer D Discussion

Incorrect. Plausible if they believe the orginal SGTR and MSLB results in 4 points. Second part is correct.

Basis for meeting the KA

Question requires knowledge of the threshold SG leakage requiring EP classification.

Basis for Hi Cog

Requires analyzing plant conditions and then utilizing RP/1000/01 to determine classification criteria.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO only material in that the facility objectives related to classifications in RP/1000/01 are SRO Only. Additionally, the question requires assessing plant conditions and based on those conditions determining a section of a procedure with which to proceed. Specifically, determining the Emergency Classification is required to implement the correct sections of Emergency Response procedures.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	BANK	

Development References	Student References Provided
EAP-SEP R12 RP-1000-001	RP/1000/001

APE037 2.4.41 - Steam Generator (S/G) Tube Leak
APE037 GENERIC
Knowledge of the emergency action level thresholds and classifications. (CFR: 41.10 / 43.5 / 45.11)

401-9 Comments:	Remarks/Status

BWA04 AA2.2 - Turbine Trip
Ability to determine and interpret the following as they apply to the (Turbine Trip)
(CFR: 43.5 / 45.13)
Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Given the following Unit 1 conditions:

- Reactor power = 100%
- Turbine Stop Valve Closure channel “A” declared inoperable

1. The TS required action(s) is to declare the Turbine Stop Valves inoperable within __(1)__.

2. A design bases for the Turbine Stop Valves is to prevent the blowdown of more than one SG following a MSLB to __(2)__.

Which ONE of the following completes the statements above?

A. 1. 1 hour ONLY
   2. limit RCS cooldown and positive reactivity addition

B. 1. 1 hour ONLY
   2. prevent exceeding the reactor building design pressure

C. 1. 1 hour <u>and</u> enter TS LCO 3.0.3
   2. limit RCS cooldown and positive reactivity addition

D. 1. 1 hour <u>and</u> enter TS LCO 3.0.3
   2. prevent exceeding the reactor building design pressure

General Discussion

Answer A Discussion

Incorrect. Plausible because 1 hour would be correct if you do not take into account the inoperability of the TSV.

Second part is correct.

Answer B Discussion

Incorrect. Plausible because 1 hour would be correct if you do not take into account the inoperability of the TSV.

Second part is plausible because a Design Bases for AFIS is to prevent over pressurization of the RB.

Answer C Discussion

Correct. Per TS 3.3.15 TSVs are required to be declared inoperable in 1 hour. Because of this LCO 3.0.3 would also be entered.

The design bases for the TSVs is to prevent the blowdown of both steam generators to limit the potential for uncontrolled RCS cooldown and positive reactivity addition.

Answer D Discussion

Correct. First part is correct.

Second part is plausible because a Design Bases for AFIS is to prevent over pressurization of the RB.

Basis for meeting the KA

Question requires knowledge of how to apply TS to a TSV closure channel inoperability and the bases for the TSVs. Both are integral to turbine trip.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

The first part of the question is SRO as it requires knowledge of how LCO 3.03 is implemented in this case. The second part of the question is SRO in that it requires using information in the bases of TS 3.7.2. TDEFWP. This assessment cannot be performed based solely on systems knowledge.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

Adm-TSS R
ONS-TS-3.3.15
ONS-TSB-B 3.7.2

Student References Provided

BWA04 AA2.2 - Turbine Trip

Ability to determine and interpret the following as they apply to the (Turbine Trip)
(CFR: 43.5 / 45.13)

Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

401-9 Comments:

Remarks/Status

BWA08 2.2.25 - Refueling Canal Level Decrease
BWA08 GENERIC
Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)

Given the following Unit 1 conditions:

- Reactor is in MODE 6
- RCS boron = 2261 ppm stable
- 1C LPI pump operating
- Fuel transfer canal level is greater than 21.34 feet
- Defueling in progress

1) In accordance with TS 3.9.4 (Decay Heat Removal and Coolant Circulation – High Water Level) the 1C LPI pump __(1)__ be stopped for = 1 hour per 8 hour period.

2) The bases for maintaining fuel transfer canal level above the line indicated on the Reactor Building wall (21.34 ft) in accordance with MP/0/A/1500/009 (Defueling/Refueling Procedure) is to ensure __(2)__.

Which ONE of the following completes the statements above?

A. 1. can
2. SF Cooling pumps suction can be aligned to the skimmer to ensure visibility during fuel movement

B. 1. can
2. the potential iodine release from a fuel handling accident will not exceed offsite dose limits

C. 1. can NOT
2. SF Cooling pumps suction can be aligned to the skimmer to ensure visibility during fuel movement

D. 1. can NOT
2. the potential iodine release from a fuel handling accident will not exceed offsite dose limits

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General Discussion

The first part of this question requires a basic knowledge of how the SFP and FTC are aligned during refueling operations as well as the cooling medium for both LPI and SF Cooling. The second part of this question is a basic TS bases question.

Answer A Discussion

Incorrect.

First part is correct.

Second part is plausible since visibility during fuel movement is critical. Additionally, the limits and precautions of OP/1502/07 (Defueling/Refueling Prerequisites) and/or MP/1500/09 (Defueling/Refueling Procedure) address SF Cooling requirements and visibility of water in the SFP/FTC. Since both of the procedures L&P's address visibility issues it is plausible to believe that the procedural requirement for the water level is to ensure ability to align the SFP skimmer to allow skimming debris from surface of water that may otherwise impede ability to observe fuel movement activities in the FTC.

Answer B Discussion

Correct.

TS 3.9.4 note states:
"The required DHR loop may not be in operation for □ 1 hour per 8 hour period, provided no operations are permitted that would cause reduction of the Reactor Coolant System boron concentration."

Tech Spec 3.9.6 (Fuel Transfer Canal Water Level) requires Fuel Transfer Canal level be > 21.34 feet when moving irradiated fuel assemblies inside containment. The bases of TS 3.9.6 describes the bases for the water level to be to ensure that iodine release due to a postulated fuel handling accident is adequately captured by the water, and the offsite doses are maintained within allowable limits.

Answer C Discussion

Incorrect.

First part is incorrect but plausible because if levelwere less than 21.34 feet the LPI pump could not be stopped in accourdace with TS 3.9.5.

Second part is incorrect but plausible since visibility during fuel movement is critical. Additionally, The limits and precautions of OP/1502/07 (Defueling/Refueling Prerequisites) and/or MP/1500/09 (Defueling/Refueling Procedure) address SF Cooling requirements and visibility of water in the SFP/FTC. Since both of the procedures L&P's address visibility issues it is plausible to believe that the procedural requirement for the water level is to ensure ability to align the SFP skimmer to allow skimming debris from surface of water that may otherwise impede ability to observe fuel movement activities in the FTC.

Answer D Discussion

Incorrect.

First part is incorrect but plausible because if levelwere less than 21.34 feet the LPI pump could not be stopped in accourdace with TS 3.9.5.

Second part is correct.

Basis for meeting the KA

The question requires Tech Spec bases knowledge of why FTC water level is required by TS to be > 21.34 feet during fuel movement.

Basis for Hi Cog

Requires applying knowledge of required system alignments based on conditions given in stem.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Requires knowledge of information contained in the bases of TS 3.9.6 (Fuel Transfer Canal Water Level) regarding why the minimum water level of 21.34 feet is required. The question cannot be answered based solely on systems knowledge.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

MP/1500/09 (Defueling/Refueling Procedure)
OP/1502/07 (Defueling/Refueling Prerequisites)
TS 3.9.4
ADM-TSS R5

Student References Provided

BWA08 2.2.25 - Refueling Canal Level Decrease
BWA08 GENERIC
Knowledge of the bases in Technical Specifications for limiting conditions for operations and safety limits. (CFR: 41.5 / 41.7 / 43.2)

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 85 85 **A**

BWE08 EA2.1 - LOCA Cooldown
Ability to determine and interpret the following as they apply to the (LOCA Cooldown)
(CFR: 43.5 / 45.13)
Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Given the following Unit 3 conditions:

Initial Conditions:

- Reactor trip from 100% power

Current Conditions:

- 3TA de-energized
- RCS temperature = 549°F stable
- RCS pressure = 2110 psig stable
- Pressurizer level = 110 inches stable
- HPI Flow Train A Dixon = 190 gpm stable
- 3HP-24 Open
- 3HP-25 Open

1) The procedure that will be used to direct the plant to the point of establishing LPI Decay Heat Removal is ____(1)____.

2) The MINIMUM temperature the RCS can be cooled down to without an RCS boron sample is ____(2)____.

A. 1. LOCA Cooldown
2. 350°F

B. 1. LOCA Cooldown
2. 525°F

C. 1. Controlling Procedure For Unit Shutdown
2. 350°F

D. 1. Controlling Procedure For Unit Shutdown
2. 525°F

General Discussion

This question expects the candidate to evaluate plant conditions and determine which procedure would be used to perform the cooldown of the RCS. The second part of the question determines if the operator knows how far the RCS can be cooled to without a confirmation of RCS boron. This temperature limit is determined by the HPI suction source. A lower temperature is allowed if HPI is aligned from the BWST.

Answer A Discussion

Correct.

First part correct. HPI flow is greater than the maximum normal makeup flow capability of 160 gpm thus requiring the use of LOCA Cooldown procedure per step 4.36 of the Subsequent Actions procedure.

Second part correct. Having HPI suction from the BWST (3HP-24 and 3HP-25 open) ensures adaquate SDM to allow a cooldown to a minimum of 350 degrees without an RCS boron sample.

Answer B Discussion

Incorrect.

First part incorrect and plausible since HPI flow is greater than the maximum normal makeup flow capability of 160 gpm thus requiring the use of LOCA Cooldown procedure per step 4.36 of the Subsequent Actions procedure.

Second part incorrect and plausible. Having HPI suction from the BWST ensures adaquate SDM to allow a cooldown to a minimum of 350 degrees without an RCS boron sample. 525 degrees is the lower limit for cooling down the RCS if HPI suction were not from the BWST.

Answer C Discussion

Incorrect.

First part incorrect and plausible since the Controlling Procedure For Unit Cooldown is frequently used to perform RCS cooldown and may be used post trip if HPI flow were not required.

Second part correct. The 350 degree cooldown limit is correct with HPI flow aligned from the BWST (3HP-24 and 3HP-25 open).

Answer D Discussion

Incorrect.

First part incorrect and plausible since Controlling Procedure For Unit Cooldown is frequently used to perform RCS cooldown and may be used post trip if HPI flow were not required.

Second part incorrect. 525 degrees is the lower limit for cooling down the RCS if HPI suction were not from the BWST.

Basis for meeting the KA

This question requires analyzing plant conditions following a reactor trip and selecting LOCA Cooldown as the procedure required to perform the plant cooldown.

Basis for Hi Cog

Requires analyzing plant conditions and selecting an appropriate procedure based on the analysis.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question requires assessing facility conditions and selecting a section of the EOP with which to proceed. It requires detailed knowledge of the transfer criteria required to perform a transfer to the LOCA cooldown tab.

This question is not simple entry conditions of the EOP nor can it be answered with knowledge of just the major mitigation strategy of the subject procedures.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References
EOP Subsequent Actions tab step 4.36 EAP-LCD R9

Student References Provided

ILT39 ONS SRO NRC Examination **QUESTION** **85** 85 **A**

BWE08 EA2.1 - LOCA Cooldown

Ability to determine and interpret the following as they apply to the (LOCA Cooldown)
(CFR: 43.5 / 45.13)

Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

401-9 Comments:	Remarks/Status

SYS012 2.4.50 - Reactor Protection System (RPS)
SYS012 GENERIC
Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

Unit 1 plant conditions:

Initial conditions:
- Reactor power = 100%
- 'B' RPS Channel in MANUAL BYPASS

Current conditions:
- RC Loop A NR Press 1 (RPS Ch A) = 1790 psig
- RC Loop A NR Press 2 (RPS Ch B) = 2153 psig
- RC Loop B NR Press 1 (RPS Ch C) = 2156 psig
- RC Loop B NR Press 2 (RPS Ch D) = 2150 psig
- 1SA-01/A-2 (Channel A Low Pressure Trip) actuates

1) The RPS Channel A Low RCS Pressure Trip function at this time is __(1)__.

2) A required action in accordance with OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) is to __(2)__.

Which ONE of the following completes the statements above?

A. 1. operable
2. insert a dummy bistable in RPS Channel A and reset the channel

B. 1. NOT operable
2. insert a dummy bistable in RPS Channel A and reset the channel

C. 1. operable
2. maintain RPS Channel A in the tripped state

D. 1. NOT operable
2. maintain RPS Channel A in the tripped state

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D

General Discussion

Answer A Discussion

Incorrect,

First part is incorrect and plausible. It is reasonable to conclude that the function is operable if the RPS channel is tripped.

Second part is incorrect and plausible. This action is allowed if the channel was not a "required" channel as decribed in TS.

Answer B Discussion

Incorrect,

First part is correct Per TS bases 3.3.1 "When an RPS channel is manually tripped, the functions that were inoperable prior to tripping remain inoperable. Other functions in the same channel that were OPERABLE prior to tripping remain OPERABLE."

Second part is incorrect and plausible. This action is allowed if the channel was not a "required" channel as decribed in TS.

Answer C Discussion

Incorrect,

First part is incorrect and plausible. It is reasonable to conclude that the function is operable if the RPS channel is tripped.

Second part is correct. OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) states "IF affected RPS channel is a required RPS channel, TRIP affected RPS channel." Or as in this case it should remain tripped. An operator would still place an instrument channel in "TEST-OPERATE".

Answer D Discussion

Correct,

First part is correct Per TS bases 3.3.1 "When an RPS channel is manually tripped, the functions that were inoperable prior to tripping remain inoperable. Other functions in the same channel that were OPERABLE prior to tripping remain OPERABLE."

Second part is correct. OP/1/A/1105/014 (Control Room Instrumentation Operation And Information) states "IF affected RPS channel is a required RPS channel, TRIP affected RPS channel." Or as in this case it should remain tripped. An operator would still place an instrument channel in "TEST-OPERATE".

Basis for meeting the KA

Question requires knowledge of alarm setpoints to verify plant status. The control discussed in the question are not listedin the ARG but are in procedures directed by the ARG.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Requires knowledge of information contained in the bases of TS 3.3.1 (RPS Instrumentation) concerning operability of an RPS trip function.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References	Student References Provided
TS B3.3.1 1SA-01/A-2	

SYS012 2.4.50 - Reactor Protection System (RPS)

SYS012 GENERIC

Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

ILT39 ONS SRO NRC Examination **QUESTION 86** 86 **D**

401-9 Comments:	Remarks/Status

SYS007 A2.02 - Pressurizer Relief Tank/Quench Tank System (PRTS)

Ability to (a) predict the impacts of the following malfunctions or operations on the P S; 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)

Abnormal pressure in the PRT ....

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1SA-6/B7 (CS Quench Tank Pressure High) actuates
- 1RC-66 flow monitor indicates flow

1) The MAXIMUM Pressurizer level that AP/44 (Abnormal Pressurizer Pressure Control) will allow closing 1RC-4 is __(1)__ inches.

2) With 1RC-4 closed, the PORV requirement for LTOP is __(2)__.

Which ONE of the following completes the statements above?

A. 1. 375
 2. still satisfied because the relief path is manually available

B. 1. 400
 2. still satisfied because the relief path is manually available

C. 1. 375
 2. NOT satisfied because the RCS must have automatic pressure relief capability

D. 1. 400
 2. NOT satisfied because the RCS must have automatic pressure relief capability

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General Discussion

Normal Quench Tank pressure is < 5 psig. This question is based on assuming 1RC-66 failing open is the malfunction that causes Quench Tank Pressure to be abnormally high. If 1RC-66 fails open, AP/44 directs closing 1RC-4 (the assocaited block valve) as long as Pressurizer level has not exceeded 375 inches (along with a few other things).

Answer A Discussion

Incorrect. First part iscorrect. Second part is plausible because manual operator action is allowed for the other train of LTOP.

Answer B Discussion

Incorrect. The first part is plausible since 400 inches is the upper end of the Pressurizer level instrument. The concern with closing 1RC-4 is based on RCS pressure control with a solid pressurizer therefore using 400 inches as the max pressurizer level is plausible. 375 inches is actually the instrument corrected value used to ensure you do not close 1RC-4 with a solid pressurizer. Second part is plausible because manual operator action is allowed for the other train of LTOP.

Answer C Discussion

Correct. If 1RC-66 fails open, the Immediate Manual Actions of AP/44 will direct closing 1RC-4 (the block valve) if Pzr level has not exceeded 375 inches (along with verifying RCS pressure is < 2300 psig). Once 1RC-4 is closed the PORV cannot function as designed. Per the bases of Tech Spec 3.4.12 (LTOP), the PORV is one of the things credited with maintaining RCS pressure within the limits of LTOP requirements. To be operable it must be able to actuate automatically.

Answer D Discussion

Incorrect. The first part is plausible since 400 inches is the upper end of the Pressurizer level instrument. The concern with closing 1RC-4 is based on RCS pressure control with a solid pressurizer therefore using 400 inches as the max pressurizer level is plausible. 375 inches is actually the instrument corrected value used to ensure you do not close 1RC-4 with a solid pressurizer. Second part is plausible because manual operator action is allowed for the other train of LTOP.

Basis for meeting the KA

Normal Quench Tank Pressure is < 5 psig. The first part of the KA (predict the impacts of the following malfunctions or operations on the Pressurizer System) is matched with the second part of the question. It requires predicting the impact of the malfunction that has caused the abnormal Quench Tank pressure (failure of 1RC-66). The second part of the KA (use procedures to correct, control, or mitigate the consequences of those malfunctions or operations) is matched by determerining the affect of closing 1RC-4 on the operabilityof the PORV.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Requires knowledge of information contained in the bases of TS 3.4.12 (LTOP) concerning operability of PORV.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

AP/44
ADM-TSS R5
TS 3.4.12 bases
TS 2.1.2 bases

Student References Provided

SYS007 A2.02 - Pressurizer Relief Tank/Quench Tank System (PRTS)

Ability to (a) predict the impacts of the following malfunctions or operations on the P S; 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)

Abnormal pressure in the PRT ....

401-9 Comments:

Remarks/Status

SYS061 A2.03 - 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)

Loss of dc power ....

Given the following Unit 1 conditions:

- Reactor power = 100%
- 1DP de-energized

1) One of the design features that makes the TDEFDW pump AC independent is the Nitrogen backup supply for __(1)__.

2) The TDEFWP is __(2)__ in accordance with Tech Spec 3.7.5 (Emergency Feedwater)

Which ONE of the following completes the statements above?

A. 1. 1MS-93 (1 TD EFDW Pump)
 2. OPERABLE

B. 1. 1MS-93 (1 TD EFDW Pump)
 2. NOT OPERABLE

C. 1. 1MS-87 (TD EFDWP MS Control)
 2. OPERABLE

D. 1. 1MS-87 (TD EFDWP MS Control)
 2. NOT OPERABLE

General Discussion

The first part of this question is a systems knowledge question which relies on knowing how the cooling water valves to the MDEFWP's operate. While they are DC powered, their power is from control power for the associated MDEFWP breaker which comes from the control battery system. DP is powered from the Power battery system,

The second part of the question initially requires systems knowledge to understand that 1DP is the DC source to the TDEFWP AOP. The AOP is used to supply oil pressure during the start of the TDEFWP. If the AOP is not available the TDEFWP can be manually started locally using a lever which will manually open the steam admission valve and roll the TDEFWP. Once the pump is rolling a shaft driven oil pump provides oil pressure and the DC AOP is not needed.

Answer A Discussion

Incorrect. First part is plausible because 1MS-93 does have Nitrogen backup. However it is to keep the valve closed. Second part is plausible since the TDEFWP can still be manually started locally at the pump and once started would function normally since oil is supplied by a shaft driven AOP once the pump is operating. Since the pump is still available for use it is plausible to believe that the pump would still be considered operable.

Answer B Discussion

Incorrect. First part is plausible because 1MS-93 does have Nitrogen backup. However it is to keep the valve closed. Second part is correct.

Answer C Discussion

Incorrect. The first part is correect . Second part is plausible since the TDEFWP can still be manually started locally at the pump and once started would function normally since oil is supplied by a shaft driven AOP once the pump is operating. Since the pump is still available for use it is plausible to believe that the pump would still be considered operable.

Answer D Discussion

Correct. 1MS-87 has Nitrogen back up to allow the valve to operate during a loss of power event. TS 3.7.5 requires that the TDEFWP be able to automatically start. The loss of DP takes power away from the DC AOP which is required for the TDEFWP to be remotely started. Since the TDEFWP cannot auto start it is not operable.

Basis for meeting the KA

The question requires predicting the impact of a loss of DC power to the TDEFWP AOP and using procedures (Tech Specs) to mitigate the consequences of the loss of power.

Basis for Hi Cog

Requires analyzing plant conditions and making an operability assessment based on the analysis.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

The first part of the question is RO knowledge as it is systems knowledge. The second part of the question is SRO in that it requires using information in the bases of TS 3.7.5 to make an operability assessment of the TDEFWP. This assessment cannot be performed based solely on systems knowledge since the malfunction in question does not render the TDEFWP unavailable it only takes away its auto start capability.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References
CF-EF R26, R17 EL-DCD TS 3.7.5 bases

Student References Provided

SYS061 A2.03 - 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)

Loss of dc power ....

401-9 Comments:	Remarks/Status

GEN2.4 2.4.30 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

Given the following Unit 2 conditions:

Initial conditions:

- Unit Shutdown in progress
- ES testing in progress

Current conditions:

- A human error by a technician caused the 2C HPI pump to start
- The 2C HPI pump injected 120 gallons into the RCS

Which ONE of the following describes the requirement for notifying the NRC?

REFERENCE PROVIDED

A. 1 hour notification in accordance with 10CFR50.72

B. 4 hour notification in accordance with 10CFR50.72

C. 8 hour notification in accordance with 10CFR50.72

D. 60 day notification in accordance with 10CFR50.73

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D

General Discussion

Answer A Discussion

Incorrect: Invalid ECCS injections are reportable to the NRC within 8 hours per 10CFR50.72(b)(2)(iv)(A)
Plausible: Operator incorrectly determines injection is reportable immediately or within 1 hour – or thinks that this is a NOUE.

Answer B Discussion

Incorrect: Invalid ECCS injections are reportable to the NRC within 8 hours per 10CFR50.72(b)(2)(iv)(A)
Plausible: Valid ECCS injections are reportable to the NRC within 4 hours per 10CFR50.72(b)(2)(iv)(A)

Answer C Discussion

Incorrect: The safety injection signal was an invalid ESF actuation because it was caused by testing and not by a valid demand from the plant.
Plausible: If hes confused with the RP/13 reporting requirements for an invalid actuation – 8 hours report.

Answer D Discussion

Correct: An invalid ESF actuation is a 60 day LER report.

Basis for meeting the KA

Question requires knowledge of NRC notification requirments.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO in that it requires using knowledge of the notiffication procedure.

This an SRO task.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	BANK	

Development References	Student References Provided
NSD 202	NSD 202

GEN2.4 2.4.30 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

401-9 Comments:	Remarks/Status

SYS064 2.1.23 - Emergency Diesel Generator (ED/G) System
SYS064 GENERIC
Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 41.10 / 43.5 / 45.2 / 45.6)

Given the following Unit 1 conditions:

- Reactor power = 100%
- ACB-3 closed

1) For the Overhead Power Path to be Operable, __(1)__ of the E breakers must be Operable.

2) In accordance with OP/0/A/1106/019 (Keowee Hydro At Oconee), if the Overhead Power Path is declared NOT operable, __(2)__ must be verified Operable within one hour.

Which ONE of the following completes the statements above?

A. 1. ONLY One
   2. the Underground Power Path

B. 1. ONLY One
   2. KHU-1

C. 1. BOTH
   2. the Underground Power Path

D. 1. BOTH
   2. KHU-1

General Discussion

Answer A Discussion

Incorrect. The first part is plausible since either E breaker could supply power to the MFB and therefore provide power to all 3 ES power strings via one or both MFB's. Since either E breaker can perform the function and the underground power path is one of two emergency power paths, it is plausible to believe that only one S breaker is required. This concept would be supported if evaluated by the normal single failure criteria since a single failure (S breaker) would only result in a loss of one of the two emergency power paths. The second part is correct.

Answer B Discussion

Incorrect. The first part is plausible since either E breaker could supply power to the MFB and therefore provide power to all 3 ES power strings via one or both MFB's. Since either E breaker can perform the function and the underground power path is one of two emergency power paths, it is plausible to believe that only one S breaker is required. This concept would be supported if evaluated by the normal single failure criteria since a single failure (S breaker) would only result in a loss of one of the two emergency power paths. The second part is plausible since it would be required if the overhead power path were inoperable due to an inoperable Keowee main step-up transformer and the 28 day completion time associated with TS 3.8.1 Condition C Required Action 2.2.5 were being used. In that case C2.2.4 would require performing SR 3.8.1.16 which would required verifying (by administrative means) that the KHU associated with the overhead power path were available to be aligned to the underground power path if needed.

Answer C Discussion

Correct. The based of TS 3.8.1 identifies that both E breakers are required to be operable for the Overhead power path to be Operable. With the overhead power path not operable, the limits and precautions of OP/1106/019 (as well as TS 3.8.1 Condition C) requires verifying that the Underground power path is operable within 1 hour.

Answer D Discussion

Incorrect. First part is correct. The second part is plausible since it would be required if the overhead power path were inoperable due to an inoperable Keowee main step-up transformer and the 28 day completion time associated with TS 3.8.1 Condition C Required Action 2.2.5 were being used. In that case C2.2.4 would require performing SR 3.8.1.16 which would required verifying (by administrative means) that the KHU associated with the overhead power path were available to be aligned to the underground power path if needed.

Basis for meeting the KA

The question matches the KA since ONS does not have D/G's for emergency power. The question requires the ability to perform OP/1106/019 (Keowee Hydro At Oconee). Specifically, it requires the ability to recognize plant conditions associated with limits and precautions of the procedure and the ability to determine what section of the procedure required to be performed once the applicability of the limit and precaution has been determined.

Basis for Hi Cog

Requires analyzing plant conditions and determining equipment operability based on plant conditions.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

The first part of the question is SRO knowledge since it requires using knowledge found in the bases of Tech Specs to make an operability determination. It cannot be answered bases solely on systems knowledge since either S breaker is capable of powering all 3 ES power strings via the MFB's.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

OP/1106/019
TS 3.8.1
TS 3.8.1 bases
EL-KHG R12
ADM-TSS R5.

Student References Provided

SYS064 2.1.23 - Emergency Diesel Generator (ED/G) System
SYS064 GENERIC
Ability to perform specific system and integrated plant procedures during all modes of plant operation. (CFR: 41.10 / 43.5 / 45.2 / 45.6)

ILT39 ONS SRO NRC Examination **QUESTION 90** 90 **C**

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 91 91 **B**

SYS016 A2.01 - Non-Nuclear Instrumentation System (NNIS)

Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.5)

Detector failure ....

Given the following Unit 1 conditions:

- Reactor power = 100%
- Pressurizer Temperature RTD “A” fails

Which ONE of the following describes the Tech Spec 3.3.8 (PAM Instrumentation) Condition(s) that apply(if any)?

REFERENCE PROVIDED

A. NO Tech Spec 3.3.8 Condition applies

B. Condition A ONLY

C. Condition A and C

D. Condition H ONLY

General Discussion

This question requires an understanding that there are only two channels of Pressurizer temperature. One channel includes Pressurizer level 1 & 2 and the other channel is Pressurizer level 3. TS 3.3.8 requires both channels operable (per TS 3.3.8 Table 3.3.8-1. That means that either Pressurizer level 1 or 2 has to be operable as well as Pzr level 3 to meet the LCO requirments of TS 3.3.8. Additionally, Pzr temp A feeds both Pzr level 1 and 2 and Pzr temp B feeds Pzr level 3. This means that a loss of Pzr temp A renders both Pressurizer levels 1 and 2 inoperable therefore one of the two required channels is NOT operable.

Answer A Discussion

Incorrect. Plausible since TS 3.3.8 does not specifically require Pzr temperature to be operable.

Answer B Discussion

Correct. Condition A is for one required channel inoperable. One required channel includes Pressurizer level 1 & 2 and the other required channel is Pressurizer level 3. TS 3.3.8 requires both channels operable (per TS 3.3.8 Table 3.3.8-1. That means that either Pressurizer level 1 or 2 has to be operable as well as Pzr level 3 to meet the LCO requirments of TS 3.3.8. Additionally, Pzr temp A feeds both Pzr level 1 and 2 and Pzr temp B feeds Pzr level 3. This means that a loss of Pzr temp A renders both Pressurizer levels 1 and 2 inoperable therefore one of the two required channels is NOT operable.

Answer C Discussion

Incorrect. Plausible since there are actually two Pressurizer levels (1 & 2) rendered inoperable by the failed RTD and Condition C is for two required channels inoperable.

Answer D Discussion

Incorrect. Plausible since a common mistake when applying TS 3.3.8 is to immediately go to table 3.3.8-1 and entering the condition specified in the right hand colunmn for the PAM instrument with an inoperability.

Basis for meeting the KA

This question requires predicting the impact of a failed pressurizer temperature and then using procedures (Tech Specs) to control and or mitigate the failure.

Basis for Hi Cog

Requires analyzing plant conditions and correctly appying TS 3.3.8 based on the analysis.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO in that it requires using knowledge of the bases of TS 3.3.8 to determine the Required Actions (based on entry of the correct condition) of TS 3.3.8. This assessment cannot be performed based solely on systems knowledge.

This question cannot be answered Solely on 1 hr or less TS knowledge.
This question cannot be answered based on "above the line" TS information.
This question cannot be answered with TS Safety Limit information.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

IC-RCI R13,15,16,17,18,
TS 3.3.8
TS 3.3.8 bases
ADM-TSS R1, R5

Student References Provided

TS 3.3.8 (PAM Instrumentation)

SYS016 A2.01 - Non-Nuclear Instrumentation System (NNIS)

Ability to (a) predict the impacts of the following malfunctions or operations on the NNIS; and (b) based on those predictions, use or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.5)

Detector failure ....

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION 92** 92 **C**

SYS017 2.1.7 - In-Core Temperature Monitor (ITM) System
SYS017 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:

- ICC tab in progress
- Depressurization of both SGs is in progress

1) The MINIMUM CETC which would require entry into the OSAG is ___(1)___.

2) In the ICC tab the RB Aux fans are started to ____(2)___ the containment atmosphere.

Which ONE of the following completes the statements above?

A. 1. 700°F
2. mix

B. 1. 700°F
2. cool

C. 1. 1200°F
2. mix

D. 1. 1200°F
2. cool

ILT39 ONS SRO NRC Examination QUESTION 92

92

C

General Discussion

The ICCM display of core subcooling margin (SCM) is expected to be different due to the elevation of the RCS pressure thansmitter that inputs into the Core SCM calculations. The ICCM A Core SCM pressure transmitter is located at the pressure tap located on the A high point vent. The ICCM B Core SCM pressure transmitter is located at the pressure tap located on the RX vessel head. As a result of the higher pressure on the head compared to the high point vent the resulting ICCM A Core SCM indication will be closer to saturation than the ICCM B Core SCM.

Answer A Discussion

Incorrect. Plausible because CETCs temperatures between 700 and 1200 degrees a RCP is started in the ICC tab. Second part is correct.

Answer B Discussion

Incorrect. Plausible because CETCs temperatures between 700 and 1200 degrees a RCP is started in the ICC tab. Second part is plausible because although the Aux fans do normally provide RB cooling that is not why the are started in this case..

Answer C Discussion

Correct. IAAT CETCs > 1200 degrees the TSC will enter the OSAG (SAMG). The RB Aux fans are started to improve mixing and to obtain a better analyzer indication of the hydrogen concentration in containment.

Answer D Discussion

Incorrect. First part is correct. Second part is plausible because although the Aux fans do normally provide RB cooling that is not why the are started in this case..

Basis for meeting the KA

Requires the ability to evaluate plant performance and make operational judgments based on CETC's.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

The first part of this question is SRO as it requires assessing plant conditions and determining what procedure would be used to mitigate the event.

This question cannot be answered based solely on systems knowledge.
This knowledge not based on knowing entry conditions.
This knowledge is not major mitigation strategy of the tab.
This knowledge not based on knowing entry conditions of any tab.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References	Student References Provided
EAP-ICC R10, R6 EOP ICC Tab	

SYS017 2.1.7 - In-Core Temperature Monitor (ITM) System

SYS017 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)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 93 93 **A**

SYS002 2.1.32 - Reactor Coolant System (RCS)
SYS002 GENERIC
Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)

Given the following Unit 1 conditions:

Initial conditions:
- Reactor shutdown on 3/10 at 0400

Current conditions:
- Date/time = 3/12 at 0600
- OP/1/A/1103/011 (Draining And Nitrogen Purging RCS) in progress
- LT-5 = 47 inches stable
- RCS temperature = 82°F stable
- You are determining Time to Core Boil to update the Plant Configuration Sheet

Time to Core Boil = ______minutes.

Which ONE of the following completes the statement above?

REFERENCE PROVIDED

A. 18.6

B. 19.3

C. 20.1

D. 20.9

ILT39 ONS SRO NRC Examination QUESTION 93

93

A

General Discussion

Answer A Discussion

Correct. Use the higher temperature curve of 90 degrees and the lower level. 50 hours since S/D. This results in 18.6 minutes until core boil.

Answer B Discussion

Incorrect and plausible. It is reasonable to conclude a rounded level of 50 inches and use of the 90 degress table.

Answer C Discussion

Incorrect and plausible. It is reasonable to conclude a rounded level of 42 inches and use of the 80 degress table.

Answer D Discussion

Incorrect and plausible. It is reasonable to conclude a rounded level of 50 inches and use of the 80 degress table.

Basis for meeting the KA

Limits and precaution of the RCS Drain procedure limits how far the RCS can be drained. This limit in part is to maximize Time to Core Boil. The Time to Core Boil is determined by the CRSRO and documented on the Plant Configuration Sheet in support of Defense In Depth determination.

Basis for Hi Cog

Basis for SRO only

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

CP-RCD R37
OP1/A/1103/011
OP/O/A/1108/001 Encl. 4.46
SD1.3.5

Student References Provided

OP/O/A/1108/001 Encl. 4.46

SYS002 2.1.32 - Reactor Coolant System (RCS)
SYS002 GENERIC
Ability to explain and apply system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)

401-9 Comments:

Remarks/Status

Not enough here to get a discriminating SRO question since Ops does not do LWR's therefore only RIA-54 operation is appropriate for a question.
New KA. 002 G2.1.32

ILT39 ONS SRO NRC Examination QUESTION 94 94 **B**

GEN2.1 2.1.35 - GENERIC - Conduct of Operations
Conduct of Operations
Knowledge of the fuel-handling responsibilities of SROs. (CFR: 41.10 / 43.7)

Given the following Unit 2 conditions:

- Reactor in MODE 6
- Refueling in progress

1) The __(1)__ is/are allowed to fill the requirements of SLC 16.13.1 (Minimum Shift Staffing) of having an SRO in direct supervision of fuel handling activities during Core Alterations.

2) The __(2)__ can authorize procedure recovery steps during fuel handling to prevent fuel damage.

In accordance with OMP 2-01 (Duties and Responsibilities of On-Shift Operations Personnel), which ONE of the following completes the statements above?

A.
1. Reactor Building SRO ONLY
2. Reactor Building SRO ONLY

B.
1. Reactor Building SRO ONLY
2. Reactor Building SRO or the Refueling SRO

C.
1. Reactor Building SRO or the Refueling SRO
2. Reactor Building SRO ONLY

D.
1. Reactor Building SRO or the Refueling SRO
2. Reactor Building SRO or the Refueling SRO

General Discussion

Answer A Discussion

Incorrect.

First part is correct. OMP 2-01 states that the Reactor Building SRO is the position required by SLC 16.13.1

The second part is incorrect and plausible. It is partially correct. The RB SRO is one of the correct answers however the Refueling SRO can also authorize the procedure steps therefore RB SRO ONLY is incorrect but plausible.

Answer B Discussion

Correct.

First part is correct. OMP 2-01 states that the Reactor Building SRO is the position required by SLC 16.13.1

Second part is correct. The Reactor Building SRO and the Refueling SRO can authorize procedure steps to prevent fuel damage in an emergency.

Answer C Discussion

Incorrect.

The first part is incorrect and plausible. Both SRO's dedicated to fuel handling. Many of the responsibilities of the two SRO positions are shared however OMP 2-01 states that the Reactor Building SRO is the position required by SLC 16.13.1.

The second part is incorrect and plausible. It is partially correct. The RB SRO is one of the correct answers however the Refueling SRO can also authorize the procedure steps therefore RB SRO ONLY is incorrect but plausible.

Answer D Discussion

Incorrect.

The first part is incorrect and plausible. Both SRO's dedicated to fuel handling. Many of the responsibilities of the two SRO positions are shared however OMP 2-01 states that the Reactor Building SRO is the position required by SLC 16.13.1.

Second part is correct. The Reactor Building SRO and the Refueling SRO can authorize procedure steps to prevent fuel damage in an emergency.

Basis for meeting the KA

The question requires general knowledge of SRO fuel handling responsibilities.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO since it addresses SRO specific Fuel handling responsibilities as well as administrative requirements associated with refueling activities.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

OMP 2-01
ADM-OMP R5

Student References Provided

GEN2.1 2.1.35 - GENERIC - Conduct of Operations

Conduct of Operations

Knowledge of the fuel-handling responsibilities of SROs. (CFR: 41.10 / 43.7)

401-9 Comments:

Remarks/Status

GEN2.2 2.2.15 - GENERIC - Equipment Control

Equipment Control

Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc. (CFR: 41.10 / 43.3 / 45.13)

Given the following plant conditions:

- Makeup to the 1&2 SFP from 2A BHUT is desired

1) __(1)__ is responsible for ensuring marked up prints are available in accordance with OMP 1-02 (Rules Of Practice).

2) A set of the marked up prints are required to be available in the __(2)__.

Which ONE of the following completes the statements above?

A. 1. WCC SRO
   2. WCC AND the Control Room

B. 1. Control Room SRO
   2. WCC AND the Control Room

C. 1. WCC SRO
   2. WCC ONLY

D. 1. Control Room SRO
   2. Control Room ONLY

General Discussion

Answer A Discussion

Incorrect.

First part is incorrect and plausible. There are many activities which the WCC SRO would control and therefore be responsible for the print markups.

Second part is correct. All water movement evolutions shall be controlled from the Control Room with the aid of marked up drawings. This means that the Control Room SRO would be responsible for doing the mark ups.

Answer B Discussion

Correct.

First part is correct. Per OMP 1-02: Prints shall be marked in the Control Room and the WCC/OCC. If the evolution is controlled from the WCC/OCC the responsible SRO is responsible for ensuring the prints in the WCC/OCC and Control Room are marked up. If the evolution is controlled from the Control Room, then the Control Rom SRO is responsible for ensuring the prints in the WCC/OCC and Control Room are marked up.

Second part is correct. All water movement evolutions shall be controlled from the Control Room with the aid of marked up drawings. This means that the Control Room SRO would be responsible for doing the mark ups.

Answer C Discussion

Incorrect.

First part is incorrect and plausible. There are many activities which the WCC SRO would control and therefore be responsible for the print markups.

Second part is plausible in conjunction with the first part since it would be reasonable to assume that only the SRO responsible for the evolution would be required to have marked up prints.

Answer D Discussion

Incorrect.

First part is correct. Per OMP 1-02: Prints shall be marked in the Control Room and the WCC/OCC. If the evolution is controlled from the WCC/OCC the responsible SRO is responsible for ensuring the prints in the WCC/OCC and Control Room are marked up. If the evolution is controlled from the Control Room, then the Control Rom SRO is responsible for ensuring the prints in the WCC/OCC and Control Room are marked up.

Second part is plausible in conjunction with the first part since it would be reasonable to assume that only the SRO responsible for the evolution would be required to have marked up prints.

Basis for meeting the KA

Question requires knowledge of how to determine expected plant configuration during active evolutions using marked up drawings. Also requires knowledge of the requirements to mark up the flow drawings and where the marked up drawings must be available.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question requires knowledge of administrative procedures that specify implementation of plant normal procedures. Specifically, it requires knowledge of admin requirements when using normal operating procedures to move fluids from one location to another.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	

Development References	Student References Provided
ADM-OMP R6 OMP 1-02	

ILT39 ONS SRO NRC Examination QUESTION 95

95

B

GEN2.2 2.2.15 - GENERIC - Equipment Control

Equipment Control

Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tag-outs, etc. (CFR: 41.10 / 43.3 / 45.13)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 96 96 **B**

GEN2.2 2.2.19 - GENERIC - Equipment Control
Equipment Control
Knowledge of maintenance work order requirements. (CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 1 conditions:

The WCC SRO has the following Work Orders to schedule today;

- Item 1: PCB-10 has been tagged out for two days. Work will continue today and will cause some alarms in the Control Room to actuate

- Item 2: Trouble shooting activities will be performed on 1FDW-35 (1A Startup FDW Control). Main FDW flow will change slightly.

1) For Item 1 the MINIMUM level of interaction between the WCC SRO and the Control Room SRO is the CRO SRO __(1)__.

2) For Item 2 the MINIMUM level of interaction between the WCC SRO and the Control Room SRO is the CRO SRO must be __(2)__.

Which ONE of the following completes the statements above in accordance with OMP 2-1 (Duties and Responsibilities of On-Shift Operations Personnel)?

A. 1. must be notified of the work
2. informed of the work

B. 1. must be notified of the work
2. consulted for permission prior to beginning of the work

C. 1. is NOT required to be notified
2. informed of the work

D. 1. must be consulted for permission prior to beginning of the work
2. consulted for permission prior to beginning of the work

General Discussion

Answer A Discussion

Incorrect.

First part is correct. Limited impact on Control Room personnel or operational systems. The plant configuration will not be changed by the work but alarms or indications will be affected. For example, alarms will be received in the Control Room during the work or indications will be lost. The Control Room SRO must be informed.

Second part is incorrect and plausible. It is reasonable to conclude that informing the CRSRO is all that is required because permission to start work is granted from the WCC.

Answer B Discussion

Correct.

First part is correct. Limited impact on Control Room personnel or operational systems. The plant configuration will not be changed by the work but alarms or indications will be affected. For example, alarms will be received in the Control Room during the work or indications will be lost. The Control Room SRO must be informed.

Second part is correct. Significant impact on Control Room personnel or operational systems. The plant configuration will be changed as a result of an activity. For example, system parameters such as pressures and flows will change state as a result of the work activity (e.g., troubleshooting efforts). The Control Room SRO shall be consulted for permission prior to proceeding with the work.

Answer C Discussion

Incorrect.

First because candidate could belive that permission to start had occurred the day before it is not required today.

Second part is incorrect and plausible. It is reasonable to conclude that informing the CRSRO is all that is required because permission to start work is granted from the WCC.

Answer D Discussion

Incorrect.

First is incorrect and plausible. It is reasonable to conclude that permission from the CR SRO to begin work is required prior to causing alarms in the CR.

Second part is correct. Significant impact on Control Room personnel or operational systems. The plant configuration will be changed as a result of an activity. For example, system parameters such as pressures and flows will change state as a result of the work activity (e.g., troubleshooting efforts). The Control Room SRO shall be consulted for permission prior to proceeding with the work.

Basis for meeting the KA

Question requires knowledge of maintenance work order requirments and communications requirementsfor the SROs.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Facility licensee procedures required to obtain authority for design and operating changes in the facility. [10 CFR 55.43(b)(3)]
Some examples of SRO exam items for this topic include:
Processes for changing the plant or plant procedures.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

ILT39 ONS SRO NRC Examination QUESTION 96 | 96 | **B**

Development References
ADM-OMP R5 OMP 2-1

Student References Provided

GEN2.2 2.2.19 - GENERIC - Equipment Control
Equipment Control
Knowledge of maintenance work order requirements. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

Remarks/Status
pre submittial

GEN2.3 2.3.13 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)

Given the following Unit 1 conditions:

Initial conditions:

- Mode 6
- Defueling in progress
- 1RIA-3 (Fuel Transfer Canal Monitor) = 4 mr/hr stable
- Main Fuel Bridge Area Monitor = 6 mr/hr stable

Current conditions:

- 1RIA-3 local reading = 0 mr/hr
- 1RIA-3 View Node indication is magenta

The Re-fueling SRO will determine that Fuel Handling activities in the Reactor Building may ______ in accordance with OP/1/A/1502/007 (Operations Defueling/Refueling Responsibilities)?

Which ONE of the following completes the statement above?

A. NOT continue until a portable area monitor with local alarm capability is in place.

B. continue because only the Main Fuel Bridge Area Monitor is required.

C. NOT continue until continuous RP coverage is present on the Main Fuel Bridge.

D. continue provided 1RIA-49 (RB Normal Gas) is operable.

ILT39 ONS SRO NRC Examination QUESTION 97

97

A

General Discussion

Answer A Discussion

Correct. If 1RIA-3 is inoperable, RP must be contacted to provide a portable Area monitor with local alarm capability in accordance with OP/1502/007.

Answer B Discussion

Incorrect and plausible. Both RIAs would help protect the fuel handlers. However both RIAs are required.

Answer C Discussion

Incorrect and plausible. RP is contacted to supply the replacement instrument but is not required to provide local coverage.

Answer D Discussion

Incorrect and plausible. RIAs 49 would alarm and sound the RB evacuation alarm if highly radioactive gases were released into the RB.

Basis for meeting the KA

Question requiresd knowledge of how an inoperable RIA affects fuel handling activites.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Question requires knowledge of Fuel Handling procedures. The SRO must evaluate the RIA availability and requirements to continue fuel movement.

This is not an RO task.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

FH-FHS R
OP/1/A/1502/007

Student References Provided

GEN2.3 2.3.13 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)

401-9 Comments:

Remarks/Status

GEN2.3 2.3.14 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

In accordance with OMP 1-02 (Rules of Practice), which ONE of the following describes a condition which would allow Independent Verification of a single valve to be waived and the <u>minimum</u> level of approval required?

A. Dose received will be 14 mr for a single check
Plant SRO

B. Valve located in a room where the area dose rate is 878 mr/hr
Plant SRO

C. Dose received will be 14 mr for a single check
Operations Superintendent

D. Valve located in a room where the area dose rate is 878 mr/hr
Operations Superintendent

General Discussion

Answer A Discussion

Correct.

First part is correct. Per OMP 1-2, IV waiver is allowed for personnel dose if a single valve IV will result in a dose of > 10 mrem.

Second part is correct. An Ops supervisor is required can make this determination.

Answer B Discussion

Incorrect

First part is incorrect and plausible. The requirement for waiver due to dose rate is >1 Rem/hr.

Second part is correct. An Ops supervisor is required can make this determination.

Answer C Discussion

Incorrect:

First part is correct. Per OMP 1-2, IV waiver is allowed for personnel dose if a single valve IV will result in a dose of > 10 mrem.

Second part is incorrect and plausible. The Operations section manager is responsible for approval of dose extension above admin limits.

Answer D Discussion

Incorrect:

First part is incorrect and plausible. The requirement for waiver due to dose rate is >1 Rem/hr.

Second part is incorrect and plausible. The Operations section manager is responsible for approval of dose extension above admin limits.

Basis for meeting the KA

Question requires knowledge of how radiation exposure is handled during normal operation and independent verification.

Basis for Hi Cog

The second part of this question requires detailed knowledge of the operation of RIA 45/46 and how they react and/or overlap.

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This first part of this question requires recognition of radiation hazards that may arise during normal and abnormal situations. It requires knowledge of the process for approval requirements for waving Independent Verification which is performed by SRO's exclusively.

The question cannot be answered based solely on radiological safety principles.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	

Development References	Student References Provided
ADM-OMP OMP-1-02	

GEN2.3 2.3.14 - GENERIC - Radiation Control

Radiation Control

Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

401-9 Comments:	Remarks/Status

ILT39 ONS SRO NRC Examination **QUESTION 99** 99 **B**

GEN2.4 2.4.29 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of the emergency plan. (CFR: 41.10 / 43.5 / 45.11)

Given the following Unit 3 conditions:

- An Alert has been declared based upon EAL HOSTILE ACTION WITHIN THE OWNER CONTROLLED AREA OR AIRBORNE THREAT.

The OSM is permitted to appoint a qualified individual to perform RP/0/B/1000/002 (Control Room Emergency Coordinator Procedure) ______.

Which ONE of the following completes the statement above?

A. and declare the appropriate Emergency Classification level.

B. Enclosure 4.5, (Emergency Coordinator Parallel Actions).

C. to evaluate whether event classification is applicable to all units.

D. to complete and approve the applicable Offsite Notification form.

General Discussion

The question determines whether the SRO who is in the Emergency Coordinator Roll knows what tasks can be delegated and which must be performed by the person with Emergency Coordinator responsibility..

Answer A Discussion

Incorrect and plausible. The task of actually declaring an EAL cannot be delegated per RP/0/B/1000/002. This distractor is plausible since the SRO with Emergency Coordinator responsibility can delegate some tasks in this procedure.

Answer B Discussion

Correct.The task of completing Enclosure 4.5 can be delegated by the SRO with Emergency Coordinator responsibility per RP/0/B/1000/002. The person it is delegated to must be a qualified individual.

Answer C Discussion

Incorrect and plausible.The task of multi-unit impact cannot be delegated per RP/0/B/1000/002. This distractor is plausible since the SRO with Emergency Coordinator responsibility can delegate some tasks in this procedure.

Answer D Discussion

Incorrect and plausible. The task of completing and approving the Offsite Notification form cannot be delegated per RP/0/B/1000/002. This distractor is plausible since the SRO with Emergency Coordinator responsibility can delegate the task of completing the Offsite Notification form but cannot delegate the approval of the form..

Basis for meeting the KA

Requires generic knowledge of the Emergency plan that is not event specific but applies generally to all events that would cause a specific classification. Although there is a specific EAL in the stem of the question the answer is generic for any Alert or higher emergency classification.

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

This question is SRO because the knowledge required is tied to site specific SRO only objectives contained in the EAP-SEP lesson plan. Additionally, the knowledge required is required by the Emergency Coordinator (specifically an SRO position) since it is he who approves all offsite communications.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

EAP-SEP R5, R13.1

Student References Provided

GEN2.4 2.4.29 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of the emergency plan. (CFR: 41.10 / 43.5 / 45.11)

401-9 Comments:

Remarks/Status

ILT39 ONS SRO NRC Examination QUESTION 100 100 **A**

GEN2.4 2.4.9 - GENERIC - Emergency Procedures / Plan
Emergency Procedures / Plan
Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies.
(CFR: 41.10 / 43.5 / 45.13)

Given the following Unit 1 conditions:

Initial conditions:

- Reactor in MODE 6
- Spent Fuel Pool in Refueling Cooling Mode alignment
- Defueling in progress

Current conditions:

- Fuel Transfer Canal level decreasing

1) AP/26 (Loss of Decay Heat Removal) directs stopping all LPI pumps to __(1)__.

2) The reason AP/26 only requires establishing Containment Closure (vs. restoring containment to OPERALE) is because __(2)__.

Which ONE of the following completes the statements above?

A. 1. determine if the leak is on the discharge of the LPI pumps
2. fuel handling accidents will NOT result in significant Containment pressurization

B. 1. determine if the leak is on the discharge of the LPI pumps
2. with an OPERABLE Containment the Main Purge system cannot be used to clean up the RB atmosphere

C. 1. allow closing of 1SF-1 and 1SF-2
2. fuel handling accidents will NOT result in significant Containment pressurization

D. 1. allow closing of 1SF-1 and 1SF-2
2. with an OPERABLE Containment the Main Purge system cannot be used to clean up the RB atmosphere

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General Discussion

Answer A Discussion

Correct:

First part is correct. With FTC full and level decreasing the LPI pumps are stopped to see if it results in a change in the rate of decrease of the FTC level therefore identifying a likely location of the leak.

Second part is correct. Containment Closure is defined and explained in the bases of TS 3.9.3 (Containment Penetrations) where it explains that significant RB pressurization is not likely with accidents in MODE 6 therefore leakage requirements are less stringent.

Answer B Discussion

Incorrect:

First part is correct. With FTC full and level decreasing the LPI pumps are stopped to see if it results in a change in the rate of decrease of the FTC level therefore identifying a likely location of the leak.

Second part is incorrect and plausible. It is a true statement however it is NOT the bases behind only requiring establishing Containment Closure as described in A.

Answer C Discussion

Incorrect:

First part is incorrect and plausible. LPI pumps are stopped in this mitigation path however if the leak is not on the discharge of the LPI pumps the pumps are subsequently restarted. This path will result in closing SF 1&2 and there are cooling pumps that are secured to enable closing these valves however the Spent Fuel pump is secured instead of the LPI pump.

Second part is correct. Containment Closure is defined and explained in the bases of TS 3.9.3 (Containment Penetrations) where it explains that significant RB pressurization is not likely with accidents in MODE 6 therefore leakage requirements are less stringent.

Answer D Discussion

Incorrect

First part is incorrect and plausible. LPI pumps are stopped in this mitigation path however if the leak is not on the discharge of the LPI pumps the pumps are subsequently restarted. This path will result in closing SF 1&2 and there are cooling pumps that are secured to enable closing these valves however the Spent Fuel pump is secured instead of the LPI pump.

Second part is incorrect and plausible. It is a true statement however it is NOT the bases behind only requiring establishing Containment Closure as described in A.

Basis for meeting the KA

Requires knowledge of the mitigation strategy for a LOCA while shutdown during refueling

Basis for Hi Cog

Basis for SRO only

In accordance with Rev. 1 of "Clarification Guidance for SRO-only Questions":

Requires knowledge of the bases behind only requiring establishing containment closure following a fuel handling accident as described in the bases of TS 3.9.3 (Containment Penetrations)

The question cannot be answered by knowing only 1 hr or less TS.
The question cannot be answswered by knowing "above the line" information.
The question cannot be answered using systems knowledge.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	2009A NRC exam Q90

Development References

Q90 from 2009A NRC exam
TS 3.9.3 bases
EAP-APG R8
ADM-TSS R4
AP/26

Student References Provided

GEN2.4 2.4.9 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of low power/shutdown implications in accident (e.g., loss of coolant accident or loss of residual heat removal) mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

Remarks/Status