

ILT15 CNS SRO NRC Examination**QUESTION 76**

76

APE015/017 2.2.40 - Reactor Coolant Pump (RCP) Malfunctions

APE015/017 GENERIC

Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

Given the following:

- Unit 1 is in Mode 4
- 1A and 1B CA Pumps are aligned for standby readiness
- In service:
 - 1A ND Pump
 - 1B NC Pump
- Removed from service per R&R:
 - 1B ND Pump
 - 1A, 1C, and 1D NC Pumps

Subsequently:

- 1B NCP Supply Breaker fails
 - The crew has entered the actions of LCO 3.4.6 (RCS Loops – Mode 4)
- S/G Levels are as follows:

S/G	1A	1B	1C	1D
NR Level	11%	14%	12%	11%

Which ONE of the following completes the statements below?

Consider each statement separately

Restoring 1B ND pump ____ (1) ____ allow the crew to exit the actions of LCO 3.4.6.

Restoring 1A NC pump ____ (2) ____ allow the crew to exit the actions of LCO 3.4.6.

- A. 1. will
 2. will
- B. 1. will
 2. will NOT
- C. 1. will NOT
 2. will
- D. 1. will NOT
 2. will NOT

General Discussion

T.S 3.4.6 requires two operable loops consisting of any combination of RCS loops and RHR loops and one shall be in operation. The stem of the question provides information that one RCS and one RHR loop are operable and in operation. Following the failure of the 1B RCP, the LCO must be entered. Restoration of 1B RHR will satisfy the requirements of the LCO since two loops will be operable. Restoration of the 1A NCP seems to also satisfy the two loop requirement. However, the basis of this T.S. has additional requirements for RCS loop operability (Aux Feed available and S/G NR level $\geq 12\%$). Since S/G level does not meet the requirements for loop operability, restoration of the RCP alone will not allow the crew to exit the actions of this LCO.

Answer A Discussion

Part 1 is correct.

Part 2 is plausible if the applicant is unaware of the Tech Spec Basis requirements for RCS loop operability.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible if the applicant incorrectly recalls the requirements of the T.S. 3.4.6 and believes that two loops must be available AND in operation, or that one of each type of loop (RHR & RCS vs. a combination) must be operable.

Part 2 is plausible if the applicant is unaware of the Tech Spec Basis requirements for RCS loop operability.

Answer D Discussion

Part 1 is plausible if the applicant incorrectly recalls the requirements of the T.S. 3.4.6 and believes that two loops must be available AND in operation, or that one of each type of loop (RHR & RCS vs. a combination) must be operable.

Second part is correct.

Basis for meeting the K

With a given malfunction of a RCP, the applicant must demonstrate knowledge and the ability to apply information contained in the applicable Tech Spec Basis.

Basis for Hi Cog

This question requires more than one mental step. The applicant is required to recall information contained within a particular Tech Spec and apply that information to given conditions.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of the requirements for an operable RCS loop in Mode 4 described in the T.S. Basis Document.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

T.S.B. 3.4.6 (RCS Loops - Mode 4), Rev. 4, LCO
T.S. 3.4.6 (RCS Loops - Mode 4), Rev. 263/259, SR 3.4.6.2

Student References Provided

APE015/017 2.2.40 - Reactor Coolant Pump (RCP) Malfunctions

APE015/017 GENERIC

Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

401-9 Comments:**Remarks/Status**

ILT15 CNS SRO NRC Examination QUESTION 77

77

EPE029 EA2.04 - Anticipated Transient Without Scram (ATWS)

Ability to determine or interpret the following as they apply to a ATWS : (CFR 43.5 / 45.13)

CVCS centrifugal charging pump operating indication

Given the following:

- Unit 1 was at 100% RTP when the Main Turbine tripped
- Automatic and Manual Reactor Trips have failed
- The crew has entered EP/1/A/5000/FR-S.1 (Response to Nuclear Power Generation/ATWS)
 - Emergency Boration has been initiated

Subsequently:

- The Reactor Trip and Bypass Breakers are opened locally

Which ONE of the following correctly completes the statements below?

In order to initiate Emergency Boration, a MINIMUM of ____ (1) ____ NV Pump(s) must be in operation.

The crew will transition to EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) following verification that ____ (2) ____ .

- A.
 - 1. one
 - 2. the reactor is subcritical ONLY
 - B.
 - 1. two
 - 2. the reactor is subcritical ONLY
 - C.
 - 1. one
 - 2. SDM is verified per Reactivity Balance Procedure
 - D.
 - 1. two
 - 2. SDM is verified per Reactivity Balance Procedure
-

General Discussion

FR-S.1 will direct alignment of Emergency Boration by ensuring ONE NV pump is in operation, opening the Emergency Boration valve, and starting TWO Boric Acid Transfer Pumps. The emergency boration can only be secured following verification of required shutdown margin via sampling and completion of the associated calculation. However, this does not preclude the crew from returning to the procedure in effect (E-0) while awaiting sample results.

Answer A Discussion

CORRECT. See explanation above.

Answer B Discussion

Part 1 is plausible because the applicable step requires operation of two boric acid transfer pumps. Additionally, if the applicant is not sufficiently familiar with the procedure, they may believe that Safety Injection will be required for boration (as this is the most common boration flowpath in the EPs). Initiation of Safety Injection would result in two operating NV pumps.

Part 2 is correct.

Answer C Discussion

Part 1 is correct.

Part 2 is plausible because verification of SDM per the calculation is required to be performed (per FR-S.1) in order to secure emergency boration.

Answer D Discussion

Part 1 is plausible because the applicable step requires operation of two boric acid transfer pumps. Additionally, if the applicant is not sufficiently familiar with the procedure, they may believe that Safety Injection will be required for boration (as this is the most common boration flowpath in the EPs). Initiation of Safety Injection would result in two operating NV pumps.

Part 2 is plausible because verification of SDM per the calculation is required to be performed (per FR-S.1) in order to secure emergency boration.

Basis for meeting the K

When given conditions involving an ATWS, the applicant is required to determine (via detailed procedure knowledge) the proper centrifugal charging pump operation indication. This is demonstrated by determining the number of pumps required to be in operation for this condition.

Basis for Hi Cog

The applicant is required to compare given conditions with procedure knowledge recalled from memory in order to determine the correct selection.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(5) (Assessment and selection of procedures):

1) The question can NOT be answered solely by knowing systems knowledge.

This question requires detailed procedure knowledge and assessment of plant conditions related to procedure transition.

2) The question can NOT be answered by knowing immediate operator actions.

This question is related to knowledge of procedure transition criteria.

3) The question can NOT be answered solely by knowing entry conditions for AOP or direct entry conditions for EOPs.

These are not related to entry conditions for an EOP. This is related to a transition from one EOP to another EOP based on specific procedural guidance.

4) The question can NOT be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure. This is detailed knowledge of procedure step guidance for appropriate procedure transition.

5) The question requires the applicant to assess plant conditions and then transition to another procedure in order to continue mitigative efforts. Therefore, it is SRO knowledge.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

EP/1/A/5000/FR-S.1 (Response to Nuclear Power Generation/ATWS), Rev. 022, Steps 4, 17, and 19

Student References Provided

EPE029 EA2.04 - Anticipated Transient Without Scram (ATWS)

Ability to determine or interpret the following as they apply to a ATWS : (CFR 43.5 / 45.13)

CVCS centrifugal charging pump operating indication

401-9 Comments:**Remarks/Status**

CHIEF EXAMINER NOTE:

EARLY SUBMITTAL QUESTION

NOTES:

This question was discussed with Chief Examiner on 12/2/14 due to difficulty in meeting K/A at the SRO level. Chief Examiner requested further research of the ATWS procedure for alternate procedure selection (possibly sheared RCP shaft with failure of Rx Trip). Exam author agreed to do more research.

Discussed again on 2/12/15. Presented question with first part related to required number of CVCS pumps required to satisfy Emergency Boration (as the operating indication) followed by a question concerning the ability to leave the ATWS procedure prior to SDM calculation completion (i.e. required for securing emergency boration). Chief Examiner agreed in principle.

ILT15 CNS SRO NRC Examination QUESTION 78

78

EPE038 2.4.41 - Steam Generator Tube Rupture (SGTR)

EPE038 GENERIC

Knowledge of the emergency action level thresholds and classifications. (CFR: 41.10 / 43.5 / 45.11)

Given the following:

- Unit 1 has experienced a Loss of Offsite Power
- 1B D/G failed to start
- Safety Injection was initiated due to decreasing PZR level following Reactor Trip
- Given the following parameters
 - All CA flow control valves are closed
 - All S/G pressures are approximately 1125 psig and stable
 - 1A S/G NR level is 67% and increasing
 - 1B, 1C, & 1D S/G NR levels are 39% and stable
 - NC Subcooling is 8°F and stable

Which ONE of the following describes the correct classification for this event in accordance with RP/0/A/5000/001 (Classification of Emergency)?

REFERENCE PROVIDED

- A. 4.1.S.2
 - B. 4.1.S.3
 - C. 4.1.A.1
 - D. 4.5.A.2
-

General Discussion

A loss of offsite power along with a loss of one D/G would degrade AC power capability to a single source of power. This condition would result in an Alert, per 4.5.A.2 in 15 minutes.

1A S/G is ruptured as indicated by uncontrollable rise in S/G NR level and SI based on PZR level. The S/G pressure of 1125 psig corresponds to the PORV setpoint. Therefore, a release to the environment is occurring with greater than Tech Spec allowable leakage. This results in a loss of the containment barrier. Additionally, A tube rupture exceeding the capacity of one charging pump (need to SI) results in a Potential Loss of RCS barrier. Loss of Containment + Potential Loss of RCS Barrier = 4.1.S.3

Answer A Discussion

Plausible because the correct classification does include a loss and potential loss of two barriers. However, one of the barriers lost is Containment which is not listed in 4.1.S.2.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Plausible because this would be the correct classification for the Safety Injection alone (i.e. if the applicant fails to diagnose the tube rupture). This classification would also take precedent over 4.5.A.2 since it would be determined in Enclosure 1 of RP/01.

Answer D Discussion

Plausible because this is a correct classification for the given data. However, it would not be the correct classification as the determination would be made in Enclosure 1 per RP/01.

Basis for meeting the K

The applicant is required to demonstrate knowledge of Emergency Action Level Classifications as related to a Steam Generator Tube Rupture.

Basis for Hi Cog

The applicant must apply given information in order to make a determination when compared to a chart of classification conditions.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(6):
An evaluation of Emergency Classifications based on core conditions is required.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

RP/0/A/5000/001 (Classification of Emergency), Rev. 033, Enclosure 4.1 & 4.5

Student References Provided

RP/0/A/5000/001

EPE038 2.4.41 - Steam Generator Tube Rupture (SGTR)

EPE038 GENERIC

Knowledge of the emergency action level thresholds and classifications. (CFR: 41.10 / 43.5 / 45.11)

401-9 Comments:**Remarks/Status**

ILT15 CNS SRO NRC Examination QUESTION 79

79

APE058 2.1.23 - Loss of DC Power

APE058 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 was at 100% power when a total loss of onsite and offsite power occurred.
- (1) Which procedure contains voltage values on essential DC busses (EDA, EDB, EDC, and EDD) requiring essential batteries (EBA, EBB, EBC, EBD) to be removed from service?
- (2) After power is restored and the battery chargers are placed in service, in accordance with Tech Spec 3.8.4 (DC Sources – Operating), what is the MINIMUM voltage required for the essential batteries to be OPERABLE?

Procedure Legend:

AP/1/A/5500/007 (Loss of Normal Power)

AP/1/A/5500/029 (Loss of Vital or Aux Control Power)

- A. 1. AP/07
 2. 125 volts
- B. 1. AP/29
 2. 125 volts
- C. 1. AP/07
 2. 110 volts
- D. 1. AP/29
 2. 110 volts
-

General Discussion

AP/29, Enclosure 1, Step 5.e requires separating the battery from the DC bus when battery voltage decays to 105 VDC, by opening the associated battery output breaker.

Answer A Discussion

Part 1 is plausible because AP/007 contains numerous instructions for batteries, including in Case II, "Loss of All Power to an Essential Train". The CAUTION just prior to step 13.c contains instructions regarding battery depletion. There are additional instructions elsewhere in the procedure for Standby Shutdown Facility batteries, and for Switchyard batteries. Enclosure 17, "Switchyard Battery Conservation) contains detailed instructions (Step 6 and 7) for batteries.

Part 2 is correct.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible because AP/007 contains numerous instructions for batteries, including in Case II, "Loss of All Power to an Essential Train". The CAUTION just prior to step 13.c contains instructions regarding battery depletion. There are additional instructions elsewhere in the procedure for Standby Shutdown Facility batteries, and for Switchyard batteries. Enclosure 17, "Switchyard Battery Conservation) contains detailed instructions (Step 6 and 7) for batteries.

Part 2 is plausible because 110 volts could be reasoned as the operability minimum since it is approximately 10% below float voltage.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because 110 volts could be reasoned as the operability minimum since it is approximately 10% below float voltage.

Basis for meeting the K

With a given blackout (meaning the DC system is now the source of any power), the applicant is required to demonstrate the ability to perform specific plant procedures (AOP and T.S.).

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) The question involves application of required actions of Tech Spec 3.8.4 (DC Sources Operating).
- 5) The question involves knowledge of TS bases that is required to analyze TS required actions and terminology.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	

Development References

AP/1/A/5500/029 (Loss of Vital or Aux Control Power), Rev. 28, Enclosure 1, Step 5.e
 T.S. 3.8.4 (DC Sources - Operating), Rev. 173/165, SR 3.8.4.1
 T.S.B 3.8.4 (DC Sources - Operating, Rev. 10, SR 3.8.4.1

APE058 2.1.23 - Loss of DC Power

APE058 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)

401-9 Comments:

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Remarks/Status

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ILT15 CNS SRO NRC Examination QUESTION 80

80

APE077 AA2.01 - Generator Voltage and Electric Grid Disturbances

Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 43.5 / 45.5, 45.7, and 45.8)

Operating point on the generator capability curve.....

Given the following:

- Unit 1 is at 100% RTP
- The TCC has reported that “Real Time Contingency Analysis” (RTCA) indicates INADEQUATE switchyard voltage
- The crew has entered AP/1/A/5500/037 (Generator Voltage and Electric Grid Disturbances)
- Main Generator operating conditions are as follows
 - Hydrogen Pressure (psig) 73
 - Generator VARS 750
 - Generator MW 1200

In accordance with AP/37, which ONE of the following completes the statements below?

the CRS will direct the OATC to ____ (1) ____ .

once required jumpers are placed, both trains of offsite power ____ (2) ____ remain inoperable.

REFERENCE PROVIDED

- A.
 - 1. decrease turbine load
 - 2. do
 - B.
 - 1. decrease turbine load
 - 2. do NOT
 - C.
 - 1. decrease generator voltage
 - 2. do
 - D.
 - 1. decrease generator voltage
 - 2. do NOT
-

General Discussion

AP/37 contains steps to adjust generator voltage in order to maintain operation within the limits of the Capability Curve. There is no guidance for a load reduction other than removing the turbine from service via trip.

Inadequate switchyard voltage indicated by the Real Time Contingency Analysis will require ECCS, Offsite Power, NSW, and shared ventilation systems to be declared inoperable. Installation of jumpers for the purpose of preventing "Double Sequencing" will allow the unit to exit inoperability actions for ECCS ONLY. Offsite power will remain inoperable.

Answer A Discussion

Part 1 is plausible because AP/37 Case II (Abnormal Generator or Grid Frequency) does contain guidance for decreasing turbine load.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible because AP/37 Case II (Abnormal Generator or Grid Frequency) does contain guidance for decreasing turbine load.

Part 2 is plausible because ECCS is no longer inoperable once jumpers are installed.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because ECCS is no longer inoperable once jumpers are installed.

Basis for meeting the K

The applicant is required to demonstrate the ability to interpret an operating point on the generator capability curve and apply to procedural guidance. The applicant is also required to determine Tech Spec required actions for an Electric Grid Disturbance.

Basis for Hi Cog

The applicant is required to apply given data to a chart requiring more than one mental step.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of the Design-Basis requirements for offsite circuitry along with Tech Spec application of an additional requirement based on discovery of an unanalyzed event.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

T.S.B 3.8.1 (AC Sources - Operating), Rev. 5, LCO
 OP-CN-EL-EPA (Main Power Distribution), Rev. 101, Section 7.1.2
 AP/1/A/5500/037 (Generator Voltage and Electric Grid Disturbances), Rev. 03, Step 3 and 15 RNO b.

Student References Provided

Generator Capability Curve.

APE077 AA2.01 - Generator Voltage and Electric Grid Disturbances

Ability to determine and interpret the following as they apply to Generator Voltage and Electric Grid Disturbances: (CFR: 41.5 and 43.5 / 45.5, 45.7, and 45.8)

Operating point on the generator capability curve.....

401-9 Comments:**Remarks/Status**

CHIEF EXAMINER NOTE:
 Discussed question with Chief Examiner on 02/09/15 due to difficulty in meeting K/A on SRO level. Presented question with

first half related to procedure direction for a method of correcting voltage outside of the capability curve followed by a T.S. Basis question related to low grid voltage. Chief Examiner agreed in principle.

ILT15 CNS SRO NRC Examination QUESTION 81

81

WE11 EA2.1 - Loss of Emergency Coolant Recirculation

Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation)
(CFR: 43.5 / 45.13)

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

Given the following:

- Unit 1 has experienced a Large Break LOCA
- Containment sump level is currently 3.4 feet and slowly increasing
- EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation) has been implemented
- 1NI-185A (ND Pump 1A Cont Sump Suct) AND 1NI-184B (ND Pump 1B Cont Sump Suct) will NOT open

Which ONE of the following completes the statements below?

Implementation of ____ (1) ____ is required.

The implemented procedure will direct the crew to ____ (2) ____ .

Procedure Legend:

EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)

EP/1/A/5000/ECA-1.3 (Containment Sump Blockage)

- A.
 - 1. ECA-1.1
 - 2. depressurize S/Gs to cooldown the NC system
 - B.
 - 1. ECA-1.1
 - 2. depressurize the NC system to increase SI flow
 - C.
 - 1. ECA-1.3
 - 2. depressurize S/Gs to cooldown the NC system
 - D.
 - 1. ECA-1.3
 - 2. depressurize the NC system to increase SI flow
-

General Discussion

With adequate sump level (3.4 feet and rising), ES-1.3 will ensure Containment Sump Isolation valves are open. If unable to open these valves, the correct procedure transition will be to ECA-1.1 although the system indications mimic that of sump blockage. ECA-1.1 will direct the operators to depressurize the S/Gs in order to remove RCS heat.

Answer A Discussion

CORRECT. See explanation above.

Answer B Discussion

Part 1 is correct.

Part 2 is plausible because ECA-1.1 does contain steps to depressurize the RCS, but not for the purpose of increasing SI flow. Additionally, it could be reasoned that this would be the correct action since S/Gs are essentially disconnected from the RCS.

Answer C Discussion

Part 1 is plausible because ES-1.3 contains steps to evaluate plant conditions for transition to either ECA-1.3 or ECA-1.1. The applicant could reason that ECA-1.3 would contain the actions to mitigate the given conditions since a closed isolation valve effectively causes the same condition as sump blockage.

Part 2 is correct.

Answer D Discussion

Part 1 is plausible because ES-1.3 contains steps to evaluate plant conditions for transition to either ECA-1.3 or ECA-1.1. The applicant could reason that ECA-1.3 would contain the actions to mitigate the given conditions since a closed isolation valve effectively causes the same condition as sump blockage.

Part 2 is plausible because ECA-1.1 does contain steps to depressurize the RCS, but not for the purpose of increasing SI flow. Additionally, it could be reasoned that this would be the correct action since S/Gs are essentially disconnected from the RCS.

Basis for meeting the K

Given conditions related to Loss of Emergency Coolant Recirculation capability, the applicant is required to interpret available indications and determine appropriate procedure selection during an emergency conditions.

Basis for Hi Cog

The applicant is required to compare given conditions with procedure knowledge recalled from memory in order to determine the correct selection.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the "Clarification Guidance for SRO-only Questions (Rev 1 dated 03/11/2010)" under the Screening Criteria for question linked to 10CFR55.43(b)(5) (Assessment and Selection of Procedures):

- 1) The question can NOT be answered by knowing systems knowledge alone.
- 2) The question can NOT be answered by knowing immediate Operator actions.
- 3) The question can NOT be answered by knowing AOP or EOP entry conditions.
- 4) The question can NOT be answered by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure.
- 5) The question requires the applicant to assess plant conditions and select a procedure for mitigation.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation), Rev. 29, Step 4
 EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation), Rev. 40, Step 38
 EP/1/A/5000/ECA-1.3 (Containment Sump Blockage), Rev. 11, Step 35

Student References Provided**WE11 EA2.1 - Loss of Emergency Coolant Recirculation**

Ability to determine and interpret the following as they apply to the (Loss of Emergency Coolant Recirculation)
 (CFR: 43.5 / 45.13)

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

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QUESTION 81

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401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 82

82

APE005 AA2.04 - Inoperable/Stuck Control Rod

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

Interpretation of computer in-core TC map for inoperable/stuck rod location

Unit 1 is operating at 98% power. PT/1/A/4600/001 (RCCA Movement Test) is in progress. As Control Bank D was being moved, one control rod in Control Bank D slipped to 120 steps withdrawn and stopped. Below is an incore thermocouple map one minute later.

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A
1						576		572		576					
2			546		599		611		603		605				
3				605				624				BAD		569	
4			597		602				609				617		
5		602				625				616				614	
6	563		611				611				626		623		568
7		602		606				617				620			
8	561				612		634		572				626		
9		619				611				613				614	
10	548		610				606				613				574
11				627				BAD				610		614	
12			612		599				608				622		
13				620		619				576		626		562	
14		540			628		613		608		614				
15						BAD		622		580					

Which ONE of the following completes the statements below?

Rod ____ (1) ____ is misaligned.

In order to continue Mode 1 operation, Tech. Spec. 3.1.4 (Rod Group Alignment Limits) will require a power reduction, SDM verification, and completion of ____ (2) ____ .

- A.
 - 1. D-12
 - 2. $F_{\Delta H}^N(X,Y)$ surveillance ONLY
- B.
 - 1. M-4
 - 2. $F_{\Delta H}^N(X,Y)$ surveillance ONLY
- C.
 - 1. D-12
 - 2. $F_{\Delta H}^N(X,Y)$ AND $F_Q(X,Y,Z)$ surveillances
- D.
 - 1. M-4
 - 2. $F_{\Delta H}^N(X,Y)$ AND $F_Q(X,Y,Z)$ surveillances

General Discussion

Based on the map provided, ROD M4 is the indicated rod that slipped to 120 swd (temperature is depressed in this area and higher in opposite side of core). Tech Specs requires Fq and Fdelta h be monitored within 72 hours of having a misaligned rod if we chose to continue operation below 75%.

Answer A Discussion

Part 1: Plausible that rod D-12 is the affected rod (located in control bank D), but should see by map evaluation that D4 and M12 have similar indications and are at similar locations in the core, and therefore show that D12 is not misaligned.

Part 2 is plausible because the applicant may reason that local power density will not exceed design limits following the required Tech Spec power reduction. Therefore, the Heat Flux Hot Channel Factor calculation would not be required.

Answer B Discussion

Part 1 is correct.

Part 2 is plausible because the applicant may reason that local power density will not exceed design limits following the required Tech Spec power reduction. Therefore, the Heat Flux Hot Channel Factor calculation would not be required.

Answer C Discussion

Part 1: Plausible that rod D-12 is the affected rod (located in control bank D), but should see by map evaluation that D4 and M12 have similar indications and are at similar locations in the core, and therefore show that D12 is not misaligned.

Part 2 is correct.

Answer D Discussion

CORRECT. See explanation above.

Basis for meeting the K

Question requires interpretation of incore TC map for a stuck CR.

Basis for Hi Cog

The applicant must evaluate core map to determine which rod is misaligned based on temperature profile and apply Tech Spec knowledge.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of the Applicable Safety Analysis related to Rod Group Alignments. It is therefore SRO-only knowledge.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	MODIFIED	

Development References

TS 3.1.4 (Rod Group Alignment Limits), Rev. 173/165
T.S.B. 3.1.4 (Rod Group Alignment Limits), Rev 1, Applicable Safety Analysis

Student References Provided

APE005 AA2.04 - Inoperable/Stuck Control Rod

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

Interpretation of computer in-core TC map for inoperable/stuck rod location

401-9 Comments:**Remarks/Status**

CHIEF EXAMINER NOTE:

EARLY SUBMITTAL QUESTION

ILT15 CNS SRO NRC Examination QUESTION 83

83

APE032 2.2.25 - Loss of Source Range Nuclear Instrumentation

APE032 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 is in Mode 6 offloading fuel
- N-31 and N-32 are in service
- 1A and 1B BDMS are providing accurate Source Range indication
 - 1A and 1B VCT Outlet Valve Interlock keyswitches are in "BYPASS INTERLOCK"

Subsequently:

- Source Range Instrument (N-31) fails

Which ONE of the following completes the statements below?

The CRS ____ (1) ____ required to enter the action statement of LCO 3.9.2 (Nuclear Instrumentation).

In order to meet the operability requirements of LCO 3.9.2, source range audible indication ____ (2) ____ required.

- A. 1. is
 2. is
 - B. 1. is
 2. is NOT
 - C. 1. is NOT
 2. is
 - D. 1. is NOT
 2. is NOT
-

General Discussion

T.S. 3.9.2 requires 2 of the 4 available neutron flux monitors (2 BDMS and 2 Nis) to be operable in Mode 6. The failure of one SR NI will not require entry into the actions of the LCO. The background section of the bases for this TS states that audible indication and alarm are not required for operability. Only visual indication is required.

Answer A Discussion

Part 1 is plausible because in TS applications (3.3.1) for other shutdown modes, both SR Nis are required and no other monitor can be used to satisfy the requirement.

Part 2 is plausible because audible indication would be expected to be in operation during fuel movement, is required by the shutdown procedure, and is also addressed in the AP for Malfunction of Nuclear Instrumentation.

Answer B Discussion

Part 1 is plausible because in TS applications (3.3.1) for other shutdown modes, both SR NIs are required and no other monitor can be used to satisfy the requirement.

Part 2 is correct.

Answer C Discussion

Part 1 is correct.

Part 2 is plausible because audible indication would be expected to be in operation during fuel movement, is required by the shutdown procedure, and is also addressed in the AP for Malfunction of Nuclear Instrumentation.

Answer D Discussion

CORRECT. See explanation above.

Basis for meeting the K

The applicant is required to apply information contained in the LCO bases to determine specific component operability. The applicant is also required to determine minimum requirements of the LCO given specific data.

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of the operability requirements related to Source Range Instrumentation contained in the Tech Spec Basis.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

T.S. 3.9.2 (Nuclear Instrumentation), Rev. 215/209
T.S.B 3.9.2 (Nuclear Instrumentation), Rev. 4, Applicability and Background

Student References Provided

APE032 2.2.25 - Loss of Source Range Nuclear Instrumentation

APE032 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**

ILT15 CNS SRO NRC Examination QUESTION 84

84

WE08 2.4.45 - Pressurized Thermal Shock

WE08 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 has experienced a Large Break LOCA
- As the crew enters ES-1.3, the OATC reports the following Status Indicators / Annunciators:
 - Reactor Coolant Integrity Status is RED
 - 1AD-9 B/6 “ND Trn B To C-Legs Loops A-B Lo Flow” is LIT due to trip of 1B ND Pump

Which ONE of the following completes the statement below?

The CRS is required to implement _____ .

Procedure Legend:

EP/1A/5000/ES-1.3 (Transfer to Cold Leg Recirculation)

EP/1A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock)

EP/1A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation)

- A. FR-P.1 IMMEDIATELY
 - B. FR-P.1 at step 8 of ES-1.3
 - C. ECA-1.1 IMMEDIATELY
 - D. ECA-1.1 at step 4 of ES-1.3
-

General Discussion

ES-1.3 contains guidance to suspend implantation of Critical Safety Functions until directed. Direction to enter CSFs occurs at step 8 following Containment Sump alignment. ES-1.3 also contains guidance for transition to ECA-1.1 if a loss of Cold Leg Recirculation occurs. However, a loss of one train does not constitute loss of CLR.

With the given conditions of a valid RED CSF path, the CRS will enter FR-P.1 at step 8 of ES-1.3. Conditions for entry into ECA-1.1 are not met.

Answer A Discussion

Plausible if the applicant is unaware of the requirement to suspend transition to CSF procedures until the Containment Sump is aligned in ES-1.3.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Plausible if the applicant reasons that a loss of one ND Pump constitutes entry into ECA-1.1.

Answer D Discussion

Plausible because step 4 of ES-1.3 contains direction to transition to ECA-1.1 under certain conditions. However, those conditions are not met.

Basis for meeting the K

The applicant is required to prioritize the significance of an alarm related to a potential Pressurized Thermal Shock condition and then determine proper procedure transition.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the "Clarification Guidance for SRO-only Questions (Rev 1 dated 03/11/2010)" under the Screening Criteria for question linked to 10CFR55.43(b)(5) (Assessment and Selection of Procedures):

- 1) The question can NOT be answered by knowing systems knowledge alone.
- 2) The question can NOT be answered by knowing immediate Operator actions.
- 3) The question can NOT be answered by knowing AOP or EOP entry conditions.
- 4) The question can NOT be answered by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure.
- 5) The question requires the applicant to recall procedure content from ES-0.1 and then determine appropriate procedure transition along with transition point.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation), Rev. 29, Step 4 and 8

Student References Provided

WE08 2.4.45 - Pressurized Thermal Shock

WE08 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**

ILT15 CNS SRO NRC Examination QUESTION 85

85

WE13 EA2.2 - Steam Generator Overpressure

Ability to determine and interpret the following as they apply to the (Steam Generator Overpressure)

(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 was initially at 100% power.
- The reactor tripped due to a spurious turbine trip.
- The crew has performed and exited EP/1/A/5000/E-0, (Reactor Trip or Safety Injection).
- 1B S/G pressure is being maintained at approximately 1210 psig.

Which ONE of the following completes the statements below?

The MAXIMUM number of S/G safety relief valves (associated with 1B S/G) that did NOT function as designed is ____ (1) ____ .

To mitigate this event, the CRS would enter ____ (2) ____ .

Procedure Legend:

EP/1/A/5000/FR-H.2, (Response to Steam Generator Overpressure)

EP/1/A/5000/FR-H.4, (Response to Loss of Normal Steam Release Capabilities)

- A. 1. 3
 2. FR-H.2
 - B. 1. 5
 2. FR-H.2
 - C. 1. 3
 2. FR-H.4
 - D. 1. 5
 2. FR-H.4
-

General Discussion

The lift setpoints for the SG PORVs and safeties are as follows:

1125 psig - PORV
 1175 psig - Safety
 1190 psig - Safety
 1205 psig - Safety
 1220 psig - Safety
 1230 psig - Safety

For the given conditions (1B S/G pressure at 1210 psig), 3 safety valves will have already failed to control pressure. They have NOT functioned as designed, since pressure has risen above their lift setpoints.

In accordance with F-0, Critical Safety Function Status Trees for Heat Sink, if pressure is less 1230 psig, but greater than 1175 psig, the SRO implements FR-H.4.

Answer A Discussion

Part 1 is correct.

Part 2 is plausible because S/G pressure has experienced an overpressure condition due to the failure of the PORV and three Safety Valves.

Answer B Discussion

Part 1 is plausible if the applicant incorrectly recalls the setpoint of S/G Safety Valves.

Part 2 is plausible because S/G pressure has experienced an overpressure condition due to the failure of the PORV and three Safety Valves.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is plausible if the applicant incorrectly recalls the setpoint of S/G Safety Valves.

Part 2 is correct.

Basis for meeting the K

The K/A requires testing of the purpose and/or function of the Steam Generator Overpressure system. The question also had to be written at the SRO level. The K/A is matched because the applicant must apply system knowledge of the S/G PORVs, and code safeties to aid in making a decision on which FR to implement. The other aspect of matching this K/A (including at the SRO level) is that the applicant must recall detailed information from the F-0, Critical Safety Function Status Trees, evaluate the conditions given in the stem, and combine those items with knowledge of the purpose of the Steam Generator Overpressure system, to arrive at a conclusion for which yellow path (FR) applies.

Basis for Hi Cog

This is a high cognitive level question because it involves a level of analysis of a given set of conditions, and applying system knowledge to make a conclusion on which success path is implemented for the conditions.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the "Clarification Guidance for SRO-only Questions (Rev 1 dated 03/11/2010)" under the Screening Criteria for question linked to 10CFR55.43(b)(5) (Assessment and Selection of Procedures):

- 1) The question can NOT be answered by knowing systems knowledge alone.
- 2) The question can NOT be answered by knowing immediate Operator actions.
- 3) The question can NOT be answered by knowing AOP or EOP entry conditions.
- 4) The question can NOT be answered by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure.
- 5.)The question requires the applicant to assess plant conditions, and then select the FR procedure transition for mitigation. Yellow Path FR procedures entry conditions and mitigative strategy knowledge requirements apply to SROs only.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	BANK	

Development References

EP/1/A/5000/F-0 (Critical Safety Function Status Trees), Rev. 9, Heat Sink
 OP-CN-STM-SM (Main Steam System Lesson Plan), Rev. 101, Section 2.3

Student References Provided

ILT15 CNS SRO NRC Examination QUESTION 85

85

WE13 EA2.2 - Steam Generator Overpressure

Ability to determine and interpret the following as they apply to the (Steam Generator Overpressure)

(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

ILT15 CNS SRO NRC Examination QUESTION 86

86

SYS012 A2.01 - Reactor Protection System (RPS)

Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; 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 / 45.5)

Faulty bistable operation

Given the following:

- Unit 1 is at 50% RTP
- 1A NC Loop Flow Channel II has been declared inoperable
- All required Tech Spec Actions have been completed

Subsequently:

- 1A NC Loop Flow Channel II has been BYPASSED for testing
- 1A NCP trips
- 1A NC Loop Flow Channel I bistable did not actuate

Which ONE of the following completes the statements below?

The reactor ____ (1) ____ AUTOMATICALLY trip.

In order to exit the required Tech Spec Action Statement, cooldown to Mode 5 ____ (2) ____ be required.

- A. 1. will
 2. will
 - B. 1. will
 2. will NOT
 - C. 1. will NOT
 2. will
 - D. 1. will NOT
 2. will NOT
-

General Discussion

With the given conditions, the Reactor will not automatically trip because the associated trip requires 2 of 3 logic. Since channel II is in "bypass" no signal will be initiated. Channel I failed to initiate the required signal. Therefore, only Channel III actuation which would not meet the 2 of 3 logic.

No condition exists for 2 NC loop low flow instruments inoperable so T.S. 3.0.3 would apply. This LCO requires cooldown to Mode 5. However, the associated instruments are only required in Mode 1. Therefore, LCO 3.0.3 could be exited following shutdown and no cooldown would be required.

Answer A Discussion

Part 1 is plausible if the applicant does not realize that bistables associated with Channel II will not be in a "Tripped" condition while bypassed for testing.

Part 2 is plausible if the applicant correctly applies LCO 3.0.3 but fails to recognize that this condition no longer applies once the mode of applicability is exited.

Answer B Discussion

Part 1 is plausible if the applicant does not realize that bistables associated with Channel II will not be in a "Tripped" condition while bypassed for testing.

Part 2 is correct.

Answer C Discussion

Part 1 is correct.

Part 2 is plausible if the applicant correctly applies LCO 3.0.3 but fails to recognize that this condition no longer applies once the mode of applicability is exited.

Answer D Discussion

CORRECT. See explanation above.

Basis for meeting the K

The applicant is required to use procedures (Tech Specs) to control and mitigate the effects of faulty bistable operation associated with the RPS.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to demonstrate application of generic LCO requirements (LCO 3.0.3).

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

T.S.B 3.3.2 (ESFAS Instrumentation), Rev. 10, Condition E
T.S. 3.3.1 (RTS Instrumentation), Rev. 247/240, Table 3.3.1-1, Item #10, Conditions L & M

Student References Provided**SY012 A2.01 - Reactor Protection System (RPS)**

Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; 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 / 45.5)

Faulty bistable operation

ILT15 CNS SRO NRC Examination

QUESTION 86

86

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 87

87

SYS013 A2.02 - Engineered Safety Features Actuation System (ESFAS)

Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability 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)

Excess steam demand

Given the following:

- Unit 1 has experienced a steam line break
- The crew has transitioned from EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) to EP/1/A/5000/FR-P.1 (Response to Imminent Thermal Shock Condition) due to a RED path on NC Integrity
- NCPs 1A and 1B were tripped due to high vibration
- NCPs 1C and 1D continue to operate
- The crew is at step 17 of FR-P.1, which requires isolating the cold leg accumulators

Time	0200	0205	0210
NC Pressure (psig)	780	730	700
NC Subcooling (°F)	+50	+75	+60
RVLIS D/P indication			
Train A (%)	20	21	23
Train B (%)	40	42	46

In accordance with FR-P.1 and the parameters listed above, which ONE of the following completes the statements below?

The earliest time that the CLAs can be isolated is ____ (1) ____ .

The CLAs are isolated to ____ (2) ____ .

REFERENCE PROVIDED

- A. 1. 0205
2. prevent injecting CLA water into the reactor vessel and increasing the thermal stress on the vessel
- B. 1. 0205
2. prevent injecting the CLA nitrogen bubble into the reactor, creating a gas bubble in the vessel head region
- C. 1. 0210
2. prevent injecting CLA water into the reactor vessel and increasing the thermal stress on the vessel
- D. 1. 0210
2. prevent injecting the CLA nitrogen bubble into the reactor, creating a gas bubble in the vessel head region

General Discussion

A steam break has resulted in a PTS condition and FR-P.1 has been implemented. Based on the conditions given and using the table in FR-P.1 as a reference, it can be determined that Reactor Vessel D/P should be >20% on Train A (1A NC Pump OFF and a total of 2 NC Pumps running) and that Train B D/P should be >45% (1C NC Pump ON and a total of 2 NC Pumps running). Therefore, 0210 would be the earliest time that the CLAs could be isolated.

Normally, the reason for isolating CLAs in any emergency condition is to prevent injecting the CLA nitrogen into the reactor. However, conditions during performance of FR-P.1 are unique in that a PTS concern exists and having the CLAs inject under these conditions would make the PTS condition worse. Therefore, in FR-P.1, the reason for isolating the CLAs is to prevent additional thermal stress on the reactor vessel.

Answer A Discussion

Part 1 is plausible if the applicant incorrectly interprets the table in FR-P.1.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible if the applicant incorrectly interprets the table in FR-P.1.

Part 2 is plausible because under most other circumstances this is the reason for isolating the CLAs.

Answer C Discussion

CORRECT: See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because under most other circumstances this is the reason for isolating the CLAs.

Basis for meeting the K

For the conditions given, the applicant must determine the impacts of the excess steam demand on the operation of a portion of the ESFAS (i.e. CLAs) and demonstrate the ability to use FR-P.1 to mitigate the consequences of the excess steam demand. Therefore, the KA is matched.

Basis for Hi Cog

For this situation the applicant must first analyze the conditions given to determine the minimum required Reactor Vessel D/P to allow isolation of the CLAs. The applicant must also recall from memory the reason for isolating CLAs under the conditions given. Since this requires more than one mental step, the question is high cog.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(5) (Assessment and selection of procedures):

- 1) The question can NOT be answered solely by knowing systems knowledge.
- 2) The question can NOT be answered by knowing immediate operator actions.
- 3) The question can NOT be answered solely by knowing entry conditions for AOP or direct entry conditions for EOPs.
- 4) The question can NOT be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure.
- 5) The question requires the applicant to demonstrate knowledge of when to implement attachments and appendices (EP/1/A/5000/G-1, Enclosure 9) and demonstrate knowledge of the reason for doing so.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	BANK	

Development References

EP/1/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition), Rev. 25, Step 17
FR-P.1 Background Doc, Rev. 9, Step 18

Learning Objectives:

SYS013 A2.02 - Engineered Safety Features Actuation System (ESFAS)

Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability 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)

Excess steam demand

Student References Provided

FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition) Step 17.c

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 88

88

SYS061 2.4.9 - Auxiliary / Emergency Feedwater (AFW) System
SYS061 GENERIC

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 is in Mode 4
- 1A ND train is in RHR
- CA system aligned per T.S. minimum requirements

Subsequently:

- PRT level is increasing
- PZR level is decreasing
- PZR Relief Valve and Safety Valve Temperatures indicate 105 °F and stable
- AP/1/A/5500/027 (Shutdown LOCA) has been entered

Which ONE of the following completes the statements below?

Following completion of applicable steps in AP/27, the CRS will transition to _____(1)_____ .

If needed, additional heat removal capability will be available via operation of _____(2)_____ CA Pump(s).

- A. 1. AP/1/A/5500/010 (Reactor Coolant Leak)
 2. one
 - B. 1. AP/1/A/5500/010 (Reactor Coolant Leak)
 2. two
 - C. 1. AP/1/A/5500/019 (Loss of Residual Heat Removal System)
 2. one
 - D. 1. AP/1/A/5500/019 (Loss of Residual Heat Removal System)
 2. two
-

General Discussion

Entry conditions of AP/27 are met due to the decreasing PZR level. Step 4 of AP/27 will evaluate for an ND leak (leak outside containment or increasing PRT level without indication of Safety Valve input). Based on this evolution, the CRS will transition to AP/19. If this evaluation is incorrectly performed or applied, the CRS would continue in AP/27 and could eventually transition to AP/10.

T.S. 3.7.5 requires three AFW trains in Modes 1 -4. However, this requirement is clarified by a note relating only to Mode 4 which states that only one train (including a motor driven pump) is required.

Answer A Discussion

Part 1 is plausible because this would be the correct transition for a PZR PORV leak vs. a RHR suction relief failure.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible because this would be the correct transition for a PZR PORV leak vs. a RHR suction relief failure.

Part 2 is plausible because AP/19 contains guidance to feed as many intact S/Gs as possible. Feeding all S/Gs would require two AFW pumps.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because AP/19 contains guidance to feed as many intact S/Gs as possible. Feeding all S/Gs would require two AFW pumps.

Basis for meeting the K

The applicant must demonstrate knowledge of accident mitigation involving Auxiliary Feedwater during a shutdown loss of coolant accident.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(5) (Assessment and selection of procedures):

- 1) The question can NOT be answered solely by knowing systems knowledge.
- 2) The question can NOT be answered by knowing immediate operator actions.
- 3) The question can NOT be answered solely by knowing entry conditions for AOP or direct entry conditions for EOPs.
- 4) The question can NOT be answered solely by knowing the purpose, overall sequence of events, or overall mitigative strategy of the procedure. This is detailed knowledge of steps within the body of the procedure.
- 5) The question requires detailed knowledge of procedure content through selection of appropriate procedure. Therefore, it is SRO knowledge.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

T.S. 3.7.5 (Auxiliary Feedwater System), Rev. 253/248, Applicability

Student References Provided

SYS061 2.4.9 - Auxiliary / Emergency Feedwater (AFW) System
SYS061 GENERIC

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**

CHIEF EXAMINER NOTE:

EARLY SUBMITTAL QUESTION

ILT15 CNS SRO NRC Examination QUESTION 89

89

SYS076 2.2.44 - Service Water System (SWS)

SYS076 GENERIC

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)

Given the following:

- 1000 Both Units are at 100% RTP
1AD-11 E/7 "D/G B Panel Trouble" is received
- Dispatched operator reports B/1 "Low Level Lube Tank" in alarm
 - Operator also reports leak at D/G Lube Oil Tank
 - The crew enters the actions of LCO 3.8.1 (AC Sources – Operating)
- 1005 The crew enters OP/0/A/6400/006C, Enclosure 4.11 and then transitions to Enclosure 4.12B
- 1020 Enclosure 4.12B alignment is completed

Which ONE of the following completes the statements below?

At 1005 **Unit 2** ____ (1) ____ in LCO 3.7.8 (Nuclear Service Water System), Condition "A" (One NSWS train inoperable).

At 1020 **Unit 2** ____ (2) ____ in LCO 3.7.8 (Nuclear Service Water System), Condition "A" (One NSWS train inoperable).

Procedure Legend for OP/0/A/6400/006C (Nuclear Service Water System):

Enclosure 4.11 (Operability Actions With One RN Pump and/or Its Associated D/G Inoperable With Both Units Entering an Action Statement)

Enclosure 4.12B (Alignment For Single Pump Flow Balance Due To One Train B RN Pump and/or Its Associated D/G Inoperable)

- A. 1. is
2. is
- B. 1. is
2. is NOT
- C. 1. is NOT
2. is
- D. 1. is NOT
2. is NOT

General Discussion

OP/0/A/6400/006C, Enclosures 4.11 through 4.16 has been written to direct the application of Tech Spec 3.7.8 (Nuclear Service Water) due to the complex nature of the shared system.

An inoperable D/G makes the associated RN pump inoperable (loss of Emergency power supply). Since RN is shared, this inoperability must be initially shared and both units will enter LCO 3.7.8 for "B" train. Enclosure 4.11 provides allowance for transition to perform a single pump flow balance in order to isolate one unit's flowpath to AFW and Containment Spray meeting the design basis requirement for one pump. This alignment will be performed via Enclosure 4.12B. Once complete, NSW is considered operable. However, the unit which isolated flowpaths will enter LCOs for AFW and Containment Spray.

Answer A Discussion

Part 1 is correct.

Part 2 is plausible if the applicant does not understand that completion of the Single Pump Flow Balance allows both units to exit LCO 3.7.8.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible because Unit 2B RN pump is not affected and has emergency power available.

Part 2 is plausible because completion of the Single Pump Flow Balance does create additional inoperabilities (AFW and Containment Spray).

Answer D Discussion

Part 1 is plausible because Unit 2B RN pump is not affected and has emergency power available.

Part 2 is correct.

Basis for meeting the K

The applicant is required to interpret control room indication and demonstrate understanding of operator actions related to operability of the Nuclear Service Water System.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of the allowance specified in the Tech Spec Basis (3.7.8) regarding operability of the NSW system when aligned for Single Pump Flow Balance.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

OP/0/A/6400/006C, Rev. 279, Enclosure 4.11, Step 3.5, Enclosure 4.12B Note prior to Step 3.4
 T.S.B 3.7.8 (Nuclear Service Water), Rev. 5, LCO
 OP-CN-PSS-RN (Nuclear Service Water System Lesson Plan), Rev. 104, Section 18.2

Student References Provided

SYS076 2.2.44 - Service Water System (SWS)

SYS076 GENERIC

Ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions. (CFR: 41.5 / 43.5 / 45.12)

ILT15 CNS SRO NRC Examination

QUESTION 89

89

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 90

90

SYS078 A2.01 - Instrument Air System (IAS)

Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; 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 dryer and filter malfunctions

Given the following:

- The VI system on Unit 1 has become heavily contaminated with oil
- "E" VI Dryer has become clogged
- The crew enters AP/0/A/5500/022 (Loss of Instrument Air)
- Backup VI Compressors CANNOT be started

Subsequently:

- The VI system is restored
- A Temporary Engineering change is required to align alternate air supply to CA Flow Control valves for system oil removal

Which ONE of the following completes the statements below?

During performance of AP/22, the CRS FIRST directed operators to verify proper operation of ____ (1) ____ as pressure decreased.

The required Temporary Engineering Change ____ (2) ____ require a 10CFR50.59 evaluation.

- A. 1. 1VI-670 (VI Dryer Auto Bypass)
 2. does
 - B. 1. 1VI-670 (VI Dryer Auto Bypass)
 2. does NOT
 - C. 1. 1VI-487 (Skid "E" Purge Exhaust to Atmos)
 2. does
 - D. 1. 1VI-487 (Skid "E" Purge Exhaust to Atmos)
 2. does NOT
-

General Discussion

With the air dryers clogged and pressure decreasing, AP/22 will first direct operators to verify proper operation of 1VI-487 since it is designed to operate at 85 psig. 1VI-670 is designed to operate at 80 psig.

AFW Flow control valves are Tech Spec SSCs, and therefore require a 10CFR50.59 review.

Answer A Discussion

Part 1 is plausible if the applicant reverses the setpoints and/or procedure actions concerning 1VI-670 and 1VI-487.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible if the applicant reverses the setpoints and/or procedure actions concerning 1VI-670 and 1VI-487.

Part 2 is plausible because the Instrument Air Dryers are not Tech Spec SSCs and would not require a 10CFR50.59 review. However, the affect upon the AFW system will require the review.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because the Instrument Air Dryers are not Tech Spec SSCs and would not require a 10CFR50.59 review. However, the affect upon the AFW system will require the review.

Basis for meeting the K

KA is matched because the applicant must understand the operation of the system to diagnose which automatic action will be attempted per the associated abnormal procedure.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(3):
10CFR50.59 screening and evaluation processes.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

AP/0/A/5500/022 (Loss of Instrument Air), Rev. 35, Step 1 and 6
OP-CN-SS-VI, VS, & VB (Air System Lesson Plan), Rev. 100, Section 13.1
NSD-209 (10CFR50.59 Process), Rev. 15, Appendix B

Learning Objectives:
OP-MC-SS-VI Objective 7 & 15

Student References Provided**SYS078 A2.01 - Instrument Air System (IAS)**

Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; 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 dryer and filter malfunctions

401-9 Comments:**Remarks/Status**

CHIEF EXAMINER NOTE:
Discussed question with Chief Examiner on 02/12/15 concerning difficulty in meeting K/A at the SRO level due to lack of T.S. guidance and available procedure/enclosure transitions. Chief

Examiner declined to accept detailed procedure knowledge as the SRO only basis unless a specific learning objective is available (none available). Chief Examiner suggested a tie to a Temporary Modification as the SRO justification.

ILT15 CNS SRO NRC Examination QUESTION 91

91

SYS002 2.4.50 - Reactor Coolant System (RCS)

SYS002 GENERIC

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

Given the following:

- Unit 1 is at 100% RTP
- 1AD-4 A/8 "Loose Parts Panel Trouble" has alarmed
- The BOP has determined that the sensor in alarm is located on 1A NCP
- No abnormal noise is noted

Which ONE of the following completes the statements below?

Per the ARP, the BOP may reset the alarm if no event alarms have occurred within the last ____ (1) ____ .

Per SLC 16.7-4 (Loose-Part Detection System), this channel ____ (2) ____ required to be Functional.

- A. 1. 4 hours
 2. is
 - B. 1. 4 hours
 2. is NOT
 - C. 1. 5 minutes
 2. is
 - D. 1. 5 minutes
 2. is NOT
-

General Discussion

Per the Loose Parts Annunciator Response Procedure, an alarm may be reset if no event has occurred within the last 5 minutes during a heatup or cooldown, or last 4 hours if no heatup/cooldown is in progress.

Per SLC 16.7-4:

The following Loose-Part Detection System channels are not a part of a Loose-Part Collection Region required by Regulatory Guide 1.133; therefore, the TESTING REQUIREMENTS and REMEDIAL ACTION responses do not apply to these channels:

- 1) Reactor coolant pump A
- 2) Reactor coolant pump B
- 3) Reactor coolant pump C
- 4) Reactor coolant pump D
- 5) Secondary side of steam generator A
- 6) Secondary side of steam generator B
- 7) Secondary side of steam generator C
- 8) Secondary side of steam generator D

Answer A Discussion

Part 1 is correct.

Part 2 is plausible if the applicant believes that all installed detection sensors are required to meet the requirements of SLC 16.7-4.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible because this would be the correct answer is a heatup or cooldown were in progress.

Part 2 is plausible if the applicant believes that all installed detection sensors are required to meet the requirements of SLC 16.7-4.

Answer D Discussion

Part 1 is plausible because this would be the correct answer is a heatup or cooldown were in progress.

Part 2 is correct.

Basis for meeting the K

The applicant is required to demonstrate knowledge of the requirements of the alarm response procedure related to when controls of the loose parts detection system can be operated following an actuation.

Basis for Hi Cog

Requires more than one mental step. The applicant must apply the given conditions to determine that a heat up/cooldown is not in progress and then recall the requirement for steady state conditions.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the Tech Spec Basis. Specifically, it requires the applicant to have knowledge of a channel not required to be functional which is specified in the basis of SLC 16.7-4.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

SLC 16.7-4 (Loose Part Detection System), Rev. 2, Basis
OP/1/B/6100/010E (Annunciator Response for Panel 1AD-4), A/8

Student References Provided

SYS002 2.4.50 - Reactor Coolant System (RCS)
SYS002 GENERIC

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

ILT15 CNS SRO NRC Examination

QUESTION 91

91

401-9 Comments:

Remarks/Status

CHIEF EXAMINER NOTE:

Discussed question with Chief Examiner on 02/09/15 due to difficulty in meeting alarm setpoint K/A on SRO level. Presented question with first half related to actions contained in ARP followed by SLC basis question concerning required instruments related to alarm. Chief Examiner agreed in principle.

ILT15 CNS SRO NRC Examination QUESTION 92

92

SYS016 A2.02 - 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)

Loss of power supply

Given the following:

- Unit 1 is at 100% RTP
- Channel 4 PZR Pressure has failed low
- All required T.S. actions have been completed

Subsequently:

- 1B NC Loop T_{cold} experiences a power supply failure

Which ONE of the following completes the statements below?

Channel 2 $OT_{\text{delta}T}$ setpoint will ____ (1) ____ .

Assuming no other actions are taken, the latest time that Unit 1 will be required to reach Mode 3 is in ____ (2) ____ hours.

- A. 1. increase
 2. 7
 - B. 1. decrease
 2. 7
 - C. 1. increase
 2. 78
 - D. 1. decrease
 2. 78
-

General Discussion

Concerning the OTdeltaT set point:

1. Pressure below 2235 psig will cause the set point to decrease. Therefore, Channel 4 OTdeltaT will decrease.
2. Tave below full load will cause the set point to increase. Therefore, Channel 2 OTdeltaT will increase.

T.S. 3.3.1 requires four channels of OTdeltaT operable and only contains a condition for one channel inoperable. Therefore, the Unit would enter T.S. 3.0.3. If neither instrument is repaired, the unit will be required to enter Mode 3 within 7 hours.

Answer A Discussion

CORRECT. See explanation above.

Answer B Discussion

Part 1 is plausible if the applicant believes that a power supply failure causes Tcold to fail high, or misunderstands the affect of low Tave upon OTdeltaT.

Part 2 is correct.

Answer C Discussion

Part 1 is correct.

Part 2 is plausible because this would be the correct action if only one OTdeltaT instrument were affected.

Answer D Discussion

Part 1 is plausible if the applicant believes that a power supply failure causes Tcold to fail high, or misunderstands the affect of low Tave upon OTdeltaT.

Part 2 is plausible because this would be the correct action if only one OTdeltaT instrument were affected.

Basis for meeting the K

The applicant is required to demonstrate knowledge of the affects of a loss of power related to Non-Nuclear Instrumentation and the ability to use procedures (Tech Spec.) to mitigate the consequences of the malfunction.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to apply generic LCO 3.0.3.

ALSO

5) This question requires the applicant to have knowledge of the OTdeltaT equation in order to determine the effects of instrument failures. This equation is located in the basis of TS 3.3.1.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

OP-CN-IC-IPX (Reactor Protection System Lesson Plan), Rev. 100, Section 4.11

T.S. 3.3.1 (Reactor Trip System Instrumentation), Rev. 173/165, Table 3.3.1-1, Item 6 and Condition E

Student References Provided

SYS016 A2.02 - 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)

Loss of power supply

401-9 Comments:

Remarks/Status

CHIEF EXAMINER NOTE:

EARLY SUBMITTAL QUESTION

ILT15 CNS SRO NRC Examination QUESTION 93

93

SYS034 K4.01 - Fuel Handling Equipment System (FHES)

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

Fuel protection from binding and dropping

Concerning operation of the Reactor Building Manipulator Crane, which ONE of the following completes the statements below?

In order to prevent dropping a fuel assembly, the load cell must indicate less than _____(1)_____ in order to operate the Gripper.

In accordance with MP/1/A/7150/026 B (Unit 1 Reactor Manipulator Crane Operation), any Interlock bypass, not approved by procedure, requires a MINIMUM of _____(2)_____ .

- A. 1. 500 lbs
 2. Fuel Handling SRO approval ONLY
 - B. 1. 500 lbs
 2. Fuel Handling SRO approval AND CRS notification when bypassed and restored
 - C. 1. 1200 lbs
 2. Fuel Handling SRO approval ONLY
 - D. 1. 1200 lbs
 2. Fuel Handling SRO approval AND CRS notification when bypassed and restored
-

General Discussion

The interlock that prevents dropping a fuel assembly is the low load condition (<500 lbs) which prevents operation of the gripper. Approval necessary to bypass an interlock when handling fuel assemblies is FHSRO approval and notification of the control room before bypassing and after returning to normal.

Answer A Discussion

Part 1 is correct.

Part 2 is plausible because FHSRO approval is required, however, notification of the control room is also required.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible because there is an interlock which will prevent raising the hoist (not operating the gripper) if indicated load is greater than (not less than) 1200 lbs.

Part 2 is plausible because FHSRO approval is required, however, notification of the control room is also required.

Answer D Discussion

Part 1 is plausible because there is an interlock which will prevent raising the hoist (not operating the gripper) if indicated load is greater than (not less than) 1200 lbs.

Second part is correct.

Basis for meeting the K

The applicant is required to demonstrate knowledge of an interlock which prevents fuel dropping.

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(7):
Refueling floor SRO responsibilities and Reporting requirements

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

OP-CN-FH-FHS (Fuel Handling System Lesson Plan), Rev. 101, Section 3.3 & 3.6
MP/1/A/7150/026B (Unit 1 Manipulator Crane Operation), Rev. 015, Section 5.1

Student References Provided

SYS034 K4.01 - Fuel Handling Equipment System (FHES)

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

Fuel protection from binding and dropping

401-9 Comments:**Remarks/Status**

ILT15 CNS SRO NRC Examination QUESTION 94

94

GEN2.1 2.1.40 - GENERIC - Conduct of Operations

Conduct of Operations

Knowledge of refueling administrative requirements. (CFR: 41.10 / 43.5 / 45.13)

Concerning Fuel Handling requirements, which ONE of the following completes the statements below?

PT/1/A/4550/001C (Refueling Communications Test) is required to be performed within a MAXIMUM of _____(1)_____ of commencing fuel movement.

In order to unlatch Control Rods per MP/0/A/7150/067 (Rod Cluster Control Assembly Drive Rod Latching & Unlatching), the Refueling SRO _____(2)_____ required to be in the Reactor Building.

- A. 1. 30 minutes
 2. is
 - B. 1. 30 minutes
 2. is NOT
 - C. 1. 1 hour
 2. is
 - D. 1. 1 hour
 2. is NOT
-

General Discussion

SLC 16.9-18 requires the Refueling Communications Test to be performed within One Hour of commencing fuel movement.

Per the AD-NS-ALL-1001, the Refueling SRO must be present in containment and observe all core alterations. Control Rod Latching and Unlatching qualifies as a Core Alteration.

Answer A Discussion

Part 1 is plausible because an applicant could reason that 30 minutes would be an acceptable time and possibly more conservative than the required allowance.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible because an applicant could reason that 30 minutes would be an acceptable time and possibly more conservative than the required allowance.

Part 2 is plausible if the applicant does not realize that latching control rods is a core alteration.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible if the applicant does not realize that latching control rods is a core alteration

Basis for meeting the K

The applicant is required to demonstrate knowledge of refueling administrative requirements.

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the "Clarification Guidance for SRO-only Questions (Rev. 1 dated 03/11/2010) under the Screen Criteria for questions linked to 10CFR55.43(b)(7):

It involves assessment of fuel handling equipment surveillance requirement acceptance and Refueling floor SRO responsibilities.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	NEW	

Development References

SLC 16.9-18 (Refueling Operations - Communications), Rev. 0, TR 16.9-18-1
AD-NS-ALL-1001 (Conduct of Refueling), Rev. 1, Section 3.5 and 4.12.2

GEN2.1 2.1.40 - GENERIC - Conduct of Operations

Conduct of Operations

Knowledge of refueling administrative requirements. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 95

95

GEN2.1 2.1.5 - GENERIC - Conduct of Operations

Conduct of Operations

Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)

Given the following:

- Unit 1 is at 100% RTP
- Unit 2 is in Mode 4

Which ONE of the following completes the statements below?

In order to meet the MINIMUM requirements of OMP 1-10 (Shift Manning and Overtime Requirements), _____(1)_____ licensed SROs will be onsite at all times.

Per NSD 200 (Work Hour Guidelines and Limits), all hours worked during a declared emergency _____(2)_____ be included in future work hour calculations.

- A. 1. 4
 2. will
 - B. 1. 4
 2. will NOT
 - C. 1. 5
 2. will
 - D. 1. 5
 2. will NOT
-

General Discussion

OMP 1-10 requires the following SRO positions to be filled (totaling 5):

Shift Manager (1)
Shift Supervisor (3)
STA (1)

In accordance with NSD 200, work hour controls do not apply during declared emergencies. However, all time worked during an emergency will be included in future work hour calculations.

Answer A Discussion

Part 1 is plausible because:

- SLC only requires 4 total SROs.
- Applicant may forget to add STA or SM to required total (a chart must be recalled and individual license requirements added together in order to reach the correct answer).
- Applicant may believe that requirements are less with one unit in Mode 4.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible because:

- SLC only requires 4 total SROs.
- Applicant may forget to add STA or SM to required total (a chart must be recalled and individual license requirements added together in order to reach the correct answer).
- Applicant may believe that requirements are less with one unit in Mode 4.

Part 2 is plausible because work hour calculations are reset following outage/innage rule implementation after a two day break.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because work hour calculations are reset following outage/innage rule implementation after a two day break.

Basis for meeting the K

The applicant must apply the requirements of the procedure containing the shift staffing requirements and the administrative document containing guidance on overtime rules.

Basis for Hi Cog

This question requires more than one mental step. First, the applicant must recall information contained in a shift manning chart and then determine the applicable section of the chart based on information given in the step

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(1):

Administrative controls associated with Tech Spec section 5 (shift staffing requirements)
55.43(b)(1) administrative controls associated with TS section 5.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

NSD 200 (Work Hour Guidelines and Limits), Rev. 16, Section 200.3.2
OMP 1-10 (Shift Manning and Overtime Requirements), Rev. 34, Attachment 7.1

Student References Provided

GEN2.1 2.1.5 - GENERIC - Conduct of Operations

Conduct of Operations

Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)

ILT15 CNS SRO NRC Examination

QUESTION 95

95

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 96

96

GEN2.2 2.2.40 - GENERIC - Equipment Control

Equipment Control

Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

Which ONE of the following completes the statements below?

For high activity in the reactor coolant, to ensure that the requirements of Tech. Spec. 3.4.16, (RCS Specific Activity) are met, the SRO is ALSO required to apply the requirements of AP/1/A/5500/018, (High Activity in Reactor Coolant) for NC System Dose Equivalent _____.(1)_____ .

These RCS Specific Activity limits are based on the _____.(2)_____ Design Basis Accident.

- A. 1. I-131
 2. LOCA outside containment
 - B. 1. I-131
 2. Steam Generator Tube Rupture
 - C. 1. Xe-133
 2. LOCA outside containment
 - D. 1. Xe-133
 2. Steam Generator Tube Rupture
-

General Discussion

AP-18 contains requirements to take specific actions contained in LCO 3.4.16 even though activity levels are below those specified in the Tech. Spec. The applicable Tech. Spec. Basis assume a leakage rate of 150 gpd per SG exists.

Answer A Discussion

Part 1 is correct.

Part 2 is plausible because the Tech Spec basis references a pipe break outside containment.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible because Tech Spec 3.4.16 has specific requirements for XE-133. However, there are not restrictive limits listed in AP-18.

Part 2 is plausible because the Tech Spec basis references a pipe break outside containment

Answer D Discussion

Part 1 is plausible because Tech Spec 3.4.16 has specific requirements for XE-133. However, there are not restrictive limits listed in AP-18.

Basis for meeting the K

The KA is matched. Although the G2.2.40 KA is often tested by using a question that requires the applicant to analyze given conditions, then actually use a provided reference (Tech. Spec.) to determine required actions and completion times, this question meets the KA in a new way. The Tech. Spec. for Reactor Coolant System activity is LCO 3.4.16. In order to correctly APPLY this Tech. Spec., the SRO is tested on how the specification is completely and appropriately applied by recalling content from an abnormal procedure that ensures that the Tech. Spec. is applied properly. It lists additional requirements that will ensure the spec. is met. The applicant is also tested on the basis for these specifications.

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have knowledge of the analysis which establishes limits for RCS specific activity. This information is contained within the Tech Spec Basis.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	2013 NRC Exam Q83

Development References

T.S. 3.4.16 (RCS Specific Activity), Rev. 268/264
 T.S.B 3.4.16 (RCS Specific Activity), Rev. 4, Applicable Safety Analysis
 AP/1/A/5500/018 (High Activity in Reactor Coolant), Rev. 17, Step 7
 OP-CN-AP-18 (AP/18: High Activity in Reactor Coolant Lesson Plan), Rev. 1,
 Section 3.1, Step 7

GEN2.2 2.2.40 - GENERIC - Equipment Control

Equipment Control

Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

401-9 Comments:

Remarks/Status

Student References Provided

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ILT15 CNS SRO NRC Examination QUESTION 97

97

GEN2.2 2.2.43 - GENERIC - Equipment Control

Equipment Control

Knowledge of the process used to track inoperable alarms. (CFR: 41.10 / 43.5 / 45.13)

Given the following:

- Unit 1 is in Mode 6
- 1AD-4 B/1 (S/G A Level Deviation) will not illuminate. IAE has Blocked the inputs for outage related activities
- 1AD-9 B/7 (FWST Emerg Lo Temp) will not illuminate. IAE has disconnected the associated transmitter in order to temporarily change the alarm setpoint for an upcoming test

In accordance with OMP 2-31(Control Room Instrumentation Status), which ONE of the following completes the statements below?

OMP 2-31, Attachment 1 (TMs Affecting Control Room Annunciators) will be used to track the inoperability of ____ (1) ____ .

Attachment 1 will be filed in the ____ (2) ____ .

- A. 1. 1AD-4 B/1
 2. Ops Shift Routine Logbook
 - B. 1. 1AD-9 B/7
 2. Ops Shift Routine Logbook
 - C. 1. 1AD-4 B/1
 2. Shift Work Manager Logbook
 - D. 1. 1AD-9 B/7
 2. Shift Work Manager Logbook
-

General Discussion

Per OMP 2-31 (Control Room Instrumentation Status), Attachment 1 is used for temporary modifications. Annunciators disabled for a temporary setpoint change would qualify. This log shall be filed in the OPS Shift Routines Logbook.

Answer A Discussion

Part 1 is plausible since the inputs to this annunciator have been modified on a temporary basis. However, this is not a temporary modification and is separately addressed in OMP 2-31.

Part 2 is correct.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Part 1 is plausible since the inputs to this annunciator have been modified on a temporary basis. However, this is not a temporary modification and is separately addressed in OMP 2-31.

Part 2 is plausible because most file copies (i.e. hazard barriers, and fire impairments) are maintained by the Shift Work Manager in the Work Control Center.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible because most file copies (i.e. hazard barriers, and fire impairments) are maintained by the Shift Work Manager in the Work Control Center.

Basis for meeting the K

The applicant is required to demonstrate knowledge of the method of tracking annunciators made inoperable for testing.

Basis for Hi Cog

This question requires more than one mental step. The applicant must analyze the given information, compare to knowledge recalled from memory, and then make a determination in order to correctly answer the question.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(3):
Administrative processes for temporary modifications

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	NEW	

Development References

OMP 2-31 (Control Room Instrumentation Status), Rev. 030, Section 4.2

Student References Provided

GEN2.2 2.2.43 - GENERIC - Equipment Control

Equipment Control

Knowledge of the process used to track inoperable alarms. (CFR: 41.10 / 43.5 / 45.13)

401-9 Comments:**Remarks/Status**

CHIEF EXAMINER NOTE:

EARLY SUBMITTAL QUESTION

ILT15 CNS SRO NRC Examination QUESTION 98

98

GEN2.3 2.3.12 - GENERIC - Radiation Control

Radiation Control

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

Given the following:

- Unit 1 is in Mode 3 following a refueling outage
- The status of the Personnel Air Locks (PAL) is as follows:
 - Upper Airlock Inner Door Operable
 - Upper Airlock Outer Door Operable
 - Lower Airlock Inner Door Inoperable
 - Lower Airlock Outer Door Operable
- Repairs required are on the barrel (airlock side of the inner door)

Which ONE of the following completes the statement below?

The guidance for Containment entry, to repair the Lower Airlock Door, is contained in ____ (1) ____ .

The Lower Airlock Outer Door ____ (2) ____ be opened to make the repair.

- A. 1. Tech. Spec. 3.6.2, (Containment Air Locks)
 2. may
 - B. 1. Tech. Spec. 3.6.2, (Containment Air Locks)
 2. may NOT
 - C. 1. Site Directive 3.1.2, (Access to Reactor Building and Areas Having High
 Pressure Steam Relief Devices)
 2. may
 - D. 1. Site Directive 3.1.2, (Access to Reactor Building and Areas Having High
 Pressure Steam Relief Devices)
 2. may NOT
-

General Discussion

TS 3.6.2 Bases (Containment Air Locks), contains a Note that allows entry and exit to perform repairs on air lock components. The conditions in the stem involve repairs on the barrel side (inside the airlock) of an INNER door. In this case, the OUTER door is opened, and the barrel side of the INNER door is accessed for making the repairs. Per the Tech. Spec. basis, there is a period of time (when the OUTER door is opened for access) that the containment boundary may not be intact. However, it is a short period of time, and there is a low probability of an event which could pressurize containment, and therefore is reasonable, per the Bases document.

Answer A Discussion

CORRECT. See explanation above.

Answer B Discussion

Part 1 is correct.

Part 2 is plausible because opening the Lower Airlock Outer Door would temporarily violate the containment boundary. The applicant could reason that entry through this door would not be allowed and access from Upper Containment would be required.

Answer C Discussion

Part 1 is plausible because Site Directive 3.1.2 contains guidance for Containment entries under varying conditions (different modes) and could be reasoned to contain specific guidance for airlock door repairs.

Part 2 is correct.

Answer D Discussion

Part 1 is plausible because Site Directive 3.1.2 contains guidance for Containment entries under varying conditions (different modes) and could be reasoned to contain specific guidance for airlock door repairs.

Part 2 is plausible because opening the Lower Airlock Outer Door would temporarily violate the containment boundary. The applicant could reason that entry through this door would not be allowed and access from Upper Containment would be required.

Basis for meeting the K

The applicant must apply knowledge of containment entry requirements to analyze a set of conditions pertaining to a required repair on one of the Personnel Air Locks. Therefore, the K/A is matched.

Basis for Hi Cog

This is a higher cognitive level question because it involves a level of analysis of the given situation, applying knowledge of containment entry requirements, including Technical Specifications for Containment Air Locks, and predicting the method which should be used to accomplish a needed repair on one of the airlock doors.

Basis for SRO only

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions Rev 1 dated 03/11/2010 for screening questions linked to 10CFR55.43(b)(2) (Tech Specs):

- 1) This question can NOT be answered by knowing less than 1 hour Tech Specs
- 2) This question can NOT be answered by knowing information listed "above-the-line".
- 3) This question can NOT be answered by knowing the TS Safety Limits or their bases.
- 4) This question requires the applicant to have detailed knowledge of Tech Spec 3.6.2 (Containment Air Locks) and to apply knowledge of the TS 3.6.2 Basis Document to determine the correct answer.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Comprehension	BANK	

Development References

Site Directive 3.1.2 (Access to Reactor Building and Areas Having High Pressure, Steam Relief Devices, Rev. 32, Section 5.1.6
T.S.B 3.6.2 (Containment Air Locks), Rev. 2, Actions

Student References Provided

GEN2.3 2.3.12 - GENERIC - Radiation Control
Radiation Control

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

401-9 Comments:

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 99

99

GEN2.3 2.3.6 - GENERIC - Radiation Control

Radiation Control

Ability to approve release permits. (CFR: 41.13 / 43.4 / 45.10)

For a planned release of the contents of a Monitor Tank to the Low Pressure Service Water discharge (RL) via the Nuclear Service Water System (RN), which ONE of the following describes a condition that would PREVENT approval of the release?

- A. The pH of the contents is 8.8.
 - B. A boron release with a boron concentration at 480 ppm
 - C. Planned release flowrate is 95 gpm
 - D. RN is aligned to the Standby Nuclear Service Water Pond
-

General Discussion

With RN aligned to the Standby Nuclear Service Water Pond, release cannot be approved.

Answer A Discussion

The cutoff point for approval is pH at 9.0, close to the value listed in "A".

Answer B Discussion

It's > 500 ppm, and you can still approve the release, but for only 3 hrs. in a 24 hr. period.

Answer C Discussion

Required flowrates shall be 35 - 100 gpm. Plausible to select that 95 gpm is not acceptable with an incomplete understanding of the flowrate requirements.

Answer D Discussion

CORRECT. See explanation above.

Basis for meeting the K

The KA is matched because the SRO applicant is presented with conditions involving a proposed liquid radwaste release, and then tested on conditions affecting whether the release should be approved.

Basis for Hi Cog**Basis for SRO only**

This question meets the following criteria for an SRO only question as described in the Clarification Guidance for SRO-only Questions (Rev. 1 dated 03/11/2010) under the Screen Criteria for questions linked to 10CFR55.43(b)(4) (Radiation Hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions):

1. It involves the process for a liquid release approval.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	2014 NRC Exam Q98

Development References

OP/0/B/6500/015 (Discharging a Monitor Tank to the Environment), Rev. 110, L&P 2.5, 2.7, and 2.8

OP/0/B/6500/113 (Operations Liquid Waste Release), Rev. 009, L&P 1.2

GEN2.3 2.3.6 - GENERIC - Radiation Control

Radiation Control

Ability to approve release permits. (CFR: 41.13 / 43.4 / 45.10)

401-9 Comments:

Student References Provided

Remarks/Status

ILT15 CNS SRO NRC Examination QUESTION 100

100

GEN2.4 2.4.37 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of the lines of authority during implementation of the emergency plan. (CFR: 41.10 / 45.13)

Given the following:

- A General Emergency has been declared.
- The TSC, OSC, and EOF have NOT been activated.

In accordance with RP/0/A/5000/005 (TSC Activation Procedure), which ONE of the following completes the statements below?

The SM/Emergency Coordinator's responsibility of making Protective Action Recommendations _____(1)_____ be delegated.

Turnover of command and control to the TSC or EOF _____(2)_____ relieve the SM of classification, notification, and Protective Action Recommendation (PAR) responsibilities.

- A. 1. can
 2. does
 - B. 1. can
 2. does NOT
 - C. 1. can NOT
 2. does
 - D. 1. can NOT
 2. does NOT
-

General Discussion

Until the EOF has been activated, the Emergency Coordinator remains responsible to classify the event, and that PARs are made.

Answer A Discussion

Part 1 is plausible if the applicant believes that PARs can be delegated through confusion and misunderstanding of the Emergency Coordinator's duties and responsibilities.

Part 2 is correct.

Answer B Discussion

Part 1 is plausible if the applicant believes that PARs can be delegated through confusion and misunderstanding of the Emergency Coordinator's duties and responsibilities.

Part 2 is plausible if the applicant believes that some form of command (i.e. PARs) remain with the SM.

Answer C Discussion

CORRECT. See explanation above.

Answer D Discussion

Part 1 is correct.

Part 2 is plausible if the applicant believes that some form of command (i.e. PARs) remain with the SM.

Basis for meeting the K

This K/A is matched because the question tests knowledge of the authority/responsibility during implementation of the emergency plan.

Basis for Hi Cog**Basis for SRO only**

This question is not tied to 10CFR50.43 (b) but can be classified as an SRO Plant Specific Example. This question requires additional knowledge required for the higher license level and is unique to the SRO/SM position. At CNS it is the responsibility of the SRO to classify the event in the event that an emergency is declared. Per Lesson Plan OP-CN-EP-SEP, Emergency Plan, Objective #2, the SRO is trained to: "When given a set of plant conditions and access to reference materials, correctly classify an event using RP/0/A/5000/001." This is identified as an SRO only learning objective. Objective 17, (Prepare Emergency Notification Forms), and Objective #24 (PARs) are designated as SRO only. Both the understanding of the requirements and the actual completion of the required paperwork, along with the transmittal are SRO ONLY tasks at CNS.

Job Level	Cognitive Level	QuestionType	Question Source
SRO	Memory	BANK	

Development References

OP-CN-EP-SEP (Emergency Plan Lesson Plan), Rev. 33, Objectives RP/0/A/5000/020, (TSC Activation Procedure), Rev. 036, Note just prior to Step G of Enclosure 4.1

GEN2.4 2.4.37 - GENERIC - Emergency Procedures / Plan

Emergency Procedures / Plan

Knowledge of the lines of authority during implementation of the emergency plan. (CFR: 41.10 / 45.13)

Student References Provided**401-9 Comments:****Remarks/Status**