

FACILITY NAME: McGuire

Section 9

REPORT NUMBER: 05000369,370/2009302

FINAL REFERENCE RO WRITTEN EXAM

CONTENTS:

- Final RO Written Exam (75 'as given' questions with KA and Development History, and Distracter Analysis)

Location of Electronic Files:

As submitted RO Written:

Attached

Submitted By: _____



Verified By _____



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2009 RO NRC Retake Examination

QUESTION 1

B

QuestionBank #	KA_system	KA_number	KA_desc
1801	SYS003	A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: (CFR: 41.5 / 45.5) <input type="checkbox"/> RCP pump and motor bearing temperatures

CURRENT

Given the following plant conditions:

- Unit 2 is at 20% RTP.
- NC Pump 2A Lower Bearing Temperature is currently 190°F and has been increasing for the last six hours (at a rate of approximately 5°F/hr).

Which ONE (1) of the following is the MINIMUM NCP Lower Bearing Temperature requiring NCP TRIP AND where this indication can be monitored?

- A. 235°F
OAC AND Main Control Board
- B. 225°F
OAC AND Main Control Board
- C. 235°F
OAC ONLY
- D. 225°F
OAC ONLY

45 DAY VERSION

Given the following plant conditions:

- Unit 2 is at 20% RTP.
- NC Pump 2A Lower Bearing Temperature is currently 190°F and has been increasing for the last six hours (at a rate of approximately 5°F/hr).

Which ONE (1) of the following is the minimum NCP Lower Bearing Temperature requiring NCP TRIP AND where this indication can be monitored?

- A. 235°F
OAC AND Main Control Board
- B. 225°F
OAC AND Main Control Board
- C. 235°F
OAC ONLY
- D. 225°F
OAC ONLY

401-9 Comments:

003A1.02
Stem: Underline and/or cap the word "minimum"
RFA 10/27/09

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2009 RO NRC Retake Examination QUESTION 1

B

General Discussion

Maximum NCP lower bearing temperature is 225 deg. NCP lower bearing temperature can be monitoring from both the OAC and via gages located in the control room on MC-5

KA is matched because in order to answer the question the candidate must know where the parameter (RCP pump bearing temp) can be monitored (ability to monitor), and recall the design maximum temperature and recognize at what point this limit will be exceeded and at which the pump controls would have to be operated to trip the pump.(to prevent exceeded the design maximum temperature)

Answer A Discussion

Incorrect: First part is incorrect but plausible because 235°F is the limit for #1 Seal Outlet temperature. Second part is correct, NCP lower bearing temperature can be monitoring from both the OAC and via gages located in the control room on MC-5

Answer B Discussion

CORRECT: 225 deg is the maximum design NCP lower bearing temperature and should this temperature be reached, a pump trip is required. This parameter can be monitoring on both the OAC and on MCB MC-5

Answer C Discussion

Incorrect. First part is incorrect but plausible because 235°F is the limit for #1 Seal Outlet temperature. Second part is plausible if the applicant does not recall that temperatures can be monitored on gages on MC-5.

Answer D Discussion

Incorrect: First part of the distracter is correct. Second part is plausible if the applicant does not recall that temperatures can be monitored on gages on MC-5.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE
 10/02/09: Requested change made.
 Approved. RFA 11/09/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 Lesson Plan OP-MC-PS-NCP Reactor Coolant Pump and Motor Rev. 25, Pg 43

 Learning Objective: OP-MC-PS-NCP Obj. 15

Student References Provided
 401-9 Comments?

QuestionBank #	KA_system	KA_number	KA_desc
1801	SYS003	A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: (CFR: 41.5 / 45.5) □ RCP pump and motor bearing temperatures

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QUESTION 2

C

QuestionBank #	KA_system	KA_number	KA_desc
1802	SYS003	A3.01	Ability to monitor automatic operation of the RCPS, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Seal injection flow

CURRENT

Given the following INITIAL conditions on Unit 1:

- Unit is operating at 100% RTP with all control systems in AUTO
- Charging Header Flow - 100 GPM
- Total Seal flow to NCPs - 30 GPM

The following occurs:

- 1NV-241 (U1 Seal Water Inj Flow Control) fails CLOSED
- Operators have performed the immediate actions of AP-12 (Loss of Letdown, Charging Or Seal Injection).

Which ONE (1) of the following completes the statement below?

Assuming NO FURTHER OPERATOR ACTIONS, TOTAL seal injection flow 15 minutes after the failure will be _____.

- A. 0 GPM
- B. 30 GPM
- C. 35 GPM
- D. 50 GPM

45 DAY VERSION

Given the following INITIAL conditions on Unit 1:

- Unit is operating at 100% RTP with all control systems in AUTO
- Charging Header Flow - 100 GPM
- Total Seal flow to NCPs - 30 GPM

The following occurs:

- 1NV-241 (U1 Seal Water Inj Flow Control) fails CLOSED
- Operators have performed the immediate actions of AP-12 (Loss of Letdown, Charging Or Seal Injection).

Assuming NO FURTHER OPERATOR ACTIONS, TOTAL seal injection flow 15 minutes after the failure will be _____.

- A. 0 GPM
- B. 30 GPM
- C. 35 GPM
- D. 50 GPM

401-9 Comments:

Oo3A301
 Swap B with C so values are increasing
 D: Why would flow go up given this failure and these conditions?
 RFA 10/08/09

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2009 RO NRC Retake Examination

QUESTION 2

C

General Discussion

The failure of INV-241 would isolate the normal charging flowpath resulting in all of the charging flow being diverted to the NCP seals. Immediate actions of AP-12 would have the operators isolate letdown. If no further actions are taken by the crew, PZR level would then begin to increase due to the loss of letdown and the PZR level master would reduce charging attempting to bring PZR level back to program. The level master would continue to reduce total charging flow until a flow rate of 35 GPM is reached at which point the minimum setting of level master would be reached. The PZR level master is set via a potentiometer, for a min charging flow of 35 GPM. This is the minimum flow regardless of the level master demand. Due to the closure of INV-241, all of the flow would be directed to the seals and the total charging flow is sensed upstream of INV-241 so regardless of the seal injection individual flow control valve positions, charging flow would end up at 35 GPM.

KA is matched because the candidate is required to understand the expected charging flow (seal injection) automatic response to a given transient and indicate what he would be seeing on the control board indications. (Monitor)

This is a higher cog question because the candidate given an initiating transient must predict the plant response and the resulting effect on the PZR level control system.

Answer A Discussion

Plausible: If the candidate correctly realizes that charging flow will go to minimum but does not understand that charging flow is limited to a minimum flow of 35 GPM.

Answer B Discussion

Plausible: because if the candidate does not recall that letdown would be isolated in AP-12 this would be correct.

Answer C Discussion

CORRECT: See explanation above

Answer D Discussion

Having flow go up is plausible if the applicant fails to realize that Letdown would be isolated per the immediate actions of AP-12.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Having flow go up is plausible if the applicant fails to realize that Letdown would be isolated per the immediate actions of AP-12. This statement added to the distracter 'D' discussion. Per Chief Examiner's general comments added WOOTF question.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	Development References Technical Reference(s): OP-MC-PS-ILE, Rev. 18 page 17 Learning Objective: OP-MC-PS-ILE, Obj. 7	Student References Provided
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QuestionBank #	KA_system	KA_number	KA_desc
1802	SYS003	A3.01	Ability to monitor automatic operation of the RCPS, including: (CFR: 41.7 / 45.5) □ Seal injection flow

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QUESTION 2

C

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QUESTION 3

D

QuestionBank #	KA_system	KA_number	KA_desc
1803	SYS004	K5.49	Knowledge of the operational implications of the following concepts as they apply to the CVCS: (CFR: 41.5/45.7) Purpose and method of hydrogen removal from RCS before opening system: explosion hazard, nitrogen purge

CURRENT

45 DAY VERSION

Given the following conditions on Unit 1:

- Unit is in Mode 5
- Preparations for refueling are in progress
- The crew is preparing to perform a Nitrogen purge of the VCT

Which ONE (1) of the following completes the statements below?

Nitrogen is aligned to the VCT from (1).
The purpose for performing this evolution is to (2).

- A. (1) Bulk Nitrogen
(2) Remove air and non- condensable gases from the NC System in preparation for taking the plant solid.
- B. (1) Bulk Nitrogen
(2) Remove Dissolved Hydrogen from the NC System to prevent formation of an explosive Hydrogen / Oxygen mixture.
- C. (1) Shutdown Waste Gas Decay Tank B
(2) Remove air and non- condensable gases from the NC System in preparation for taking the plant solid.
- D. (1) Shutdown Waste Gas Decay Tank B
(2) Remove Dissolved Hydrogen from the NC System to prevent formation of an explosive Hydrogen / Oxygen mixture.

Given the following conditions on Unit 1:

- Unit is in Mode 5
- Preparations for refueling are in progress
- The crew is preparing to perform a Nitrogen purge of the VCT

Nitrogen is aligned to the VCT from (1).
The purpose for performing this evolution is to (2).

- A. (1) Bulk Nitrogen
(2) Remove air and non- condensable gases from the NC System in preparation for taking the plant solid.
- B. (1) Bulk Nitrogen
(2) Remove Dissolved Hydrogen from the NC System to prevent formation of an explosive Hydrogen / Oxygen mixture.
- C. (1) Shutdown Waste Gas Decay Tank B
(2) Remove air and non- condensable gases from the NC System in preparation for taking the plant solid.
- D. (1) Shutdown Waste Gas Decay Tank B
(2) Remove Dissolved Hydrogen from the NC System to prevent formation of an explosive Hydrogen / Oxygen mixture.

401-9 Comments:

004K5.49
No comment at this time
RFA 10/27/09

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QUESTION 3

D

General Discussion

The VCT is normally aligned to bulk H2 in order to maintain a minimal concentration for O2 scavenging in the NC system. In order to perform a degas of the RCS, Radwaste will align the 'B' Shutdown Waste Gas Decay Tank to the VCT in order to provide a Nitrogen overpressure. The PZR Stm space sample is then aligned to the WG compressor which is also aligned to the 'B' SWGDT. The alignment is maintained until the Hydrogen concentration in the VCT is less than 4 % and the NCS hydrogen is less than 5cc/kg.

KA is matched because must understand the method of H2 removal from the RCS during degas. The operational implication would be alternate alignment required to be performed associated with the WG system, SWGDT B alignment to the VCT (CVCS). The candidate must also understand the operational implication of performing this alignment (To prevent an explosive mixture from being created in the NC system).

Answer A Discussion

Plausible: (1) During degas, the NCDT and the PRT are aligned to bulk Nitrogen, it would be reasonable to believe that the VCT would be aligned there as well. (2) This is also part of the degas evolution but is not accomplished by Nitrogen alignment.

Answer B Discussion

Plausible: (1) As explained above, Answer (2) is correct.

Answer C Discussion

Plausible: Answer (1) is correct.

(2) Is plausible as this is also part of the degas evolution but not accomplished by Nitrogen alignment.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's general comments, added WOOTF question. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
 Technical Reference(s): OP-MC-WE-WG Rev 11 Pg. 27

 Learning Objective: OP-MC-WE-WG Obj. 2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1803	SYS004	K5.49	Knowledge of the operational implications of the following concepts as they apply to the CVCS: (CFR: 41.5/45.7) Purpose and method of hydrogen removal from RCS before opening system: explosion hazard, nitrogen purge

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QUESTION 4

C

QuestionBank #	KA_system	KA_number	KA_desc
1804	SYS005	2.4.50	SYS005 GENERIC Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

CURRENT

45 DAY VERSION

Given the following INITIAL conditions on Unit 1:

- LTOP is in service
- $T_{ave} = 175^{\circ}\text{F}$
- Train B ND is in service

The following occurs:

- Annunciator 1AD-6 D12 (PORV NC-32B Actuated) is in alarm
- 1NC-32B (PZR PORV) indicates OPEN
- Loop "C" NARROW Range Pressure is reading 370 PSIG
- Loop "D" WIDE Range Pressure is reading 390 PSIG

Which ONE (1) of the following completes the statement below?

The controlling channel for 1NC-32B is (1), and based on the conditions above, what action (If any) would the operator be required to take? (2).

- A. (1) Loop "C" Narrow Range Pressure
(2) None, the system is responding as designed.
- B. (1) Loop "D" Wide Range Pressure
(2) None, the system is responding as designed.
- C. (1) Loop "C" Narrow Range Pressure
(2) Close or isolate 1NC-32B
- D. (1) Loop "D" Wide Range Pressure
(2) Close or isolate 1NC-32B

Given the following INITIAL conditions on Unit 1:

- LTOP is in service
- $T_{ave} = 175^{\circ}\text{F}$
- Train B ND is in service

The following occurs:

- Annunciator 1AD-6 D12 (PORV NC-32B Actuated) is in alarm
- 1NC-32B (PZR PORV) indicates OPEN
- Loop "C" NARROW Range Pressure is reading 370 PSIG
- Loop "D" WIDE Range Pressure is reading 380 PSIG

The controlling channel for 1NC-32B is (1), and based on the conditions above, the operator would be required to (2).

- A. (1) Loop "C" Narrow Range Pressure
(2) Ensure 1NC- 32B closes when NC pressure is reduced below setpoint
- B. (1) Loop "D" Wide Range Pressure
(2) Ensure 1NC- 32B closes when NC pressure is reduced below setpoint
- C. (1) Loop "C" Narrow Range Pressure
(2) Close or isolate 1NC-32B
- D. (1) Loop "D" Wide Range Pressure
(2) Close or isolate 1NC-32B

401-9 Comments:

005G2.4.50

The second part of distracters A and B do not state any manual or automatic actions. That action is not much different then the correct answer a stated in C. Potentially A and C are both correct answers. Modify the second parts of A and B.

This Q is U because of two potentially correct answers.

RFA 10/27/09

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QUESTION 4

C

General Discussion

Per procedure, RHR cannot be placed in service until RCS temperature is 250 Deg or less. Cold overpressure protection is required at this reduced temperature and is provided by PZR PORV NC-32B and NC-34A which are placed in LTOP mode at less than 320 Deg RCS temperature. The pressure channels which provide input to actuate these PORV's are 0-600 psig NR pressure instruments which are placed in service with RCS pressure below 1000 psig. The lift setpoint for these valves in LTOP mode is 385 PSIG and the input to NC-32B is from Loop 'C' NR pressure transmitter (NCPT5142). The WR pressure transmitters are in service providing indication but provide no control actions.

KA is matched because of the low temperature requirement in order to place ND in service LTOP operation is an integral part of RHR operation in providing low temperature overpressure protection. In the given situation the candidate is presented with a situation where a relief valve has actuated (alarm generated) and then failed to reclose below setpoint. The candidate much then understand how to verify alarm setpoint (correct channel) and operate controls to isolate the PORV which should now be closed.

This is a high cog question because evaluate a given set of plant conditions, determine a miss operation of a component and then decide on a action to mitigate the consequences.

Answer A Discussion

Plausible: Answer 1 is correct, answer 2 is plausible because the given WR pressure is within the range where a LTOP PORV actuation would be expected to occur but is not an input to the controlling circuit.

Answer B Discussion

Plausible: If the candidate believes the WR pressure inputs LTOP. Setpoint is plausible as described above.

Answer C Discussion

CORRECT

Answer D Discussion

Plausible: Answer one is plausible as described above and answer 2 is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Stem modified to ask what action (if any) would be required, distracters A,B changed to "None" system is responding properly. this addresses the concern with A,B being potentially correct. Per Chief Examiner's general comments added WOOTF question.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 Technical Reference(s):Lesson Plan OP-MC-PS-NC, Reactor Coolant System, Rev. 32, page 35
 Lesson Plan OP-MC-PS-IPE, Pressurizer Pressure Control page 27 and 29

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1804	SYS005	2.4.50	SYS005 GENERIC Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

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QUESTION 4

C

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QUESTION 5

A

QuestionBank #	KA_system	KA_number	KA_desc
1805	SYS006	K2.01	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> ECCS pumps

CURRENT

Given the following on Unit 2:

- A Reactor Trip and Safety Injection have occurred due to a Small Break LOCA
- The 2A Safety Injection (NI) pump failed to automatically start
- Attempts to manually start the pump have been unsuccessful

To which ONE (1) of the following locations should the NEO be dispatched to check the 2A NI pump feeder breaker?

- A. 2ETA
- B. 2EMXA
- C. 2ELXA
- D. 2TA

45 DAY VERSION

Given the following on Unit 2:

- A Reactor Trip and Safety Injection have occurred due to a Small Break LOCA
- The 2A Safety Injection (NI) pump failed to automatically start
- Attempts to manually start the pump have been unsuccessful

To which ONE (1) of the following locations should the NEO be dispatched to check the 2A NI pump breaker?

- A. 2ETA
- B. 2EMXA
- C. 2ELXA
- D. 2TA

401-9 Comments:

006K2.01

Please justify why 2EMXA and 2ELXA are plausible. Neither the distracter analysis nor the reference material supports their plausibility. This E is U until justified due to two NP distracters.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 5

A

General Discussion

The 2A NI Pump is powered from Emergency Bus 2ETA. It is not powered from a Safety Related Load Center (i.e. EMXA).

The KA is matched because the applicant is required to know the power supplies to the Safety Injections pumps.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Correct unit. However, wrong bus. 2EMXA is plausible because it is an emergency bus which carries large loads (600 VAC) and is fed from 2ETA via 2ELXA.

Answer C Discussion

Incorrect. Correct unit. However, wrong bus. 2ELXA is plausible because it is an emergency bus which carries large loads (600 VAC) and is fed from 2ETA.

Answer D Discussion

Incorrect. Correct unit. However, wrong bus. 2TA is plausible because it is the normal power supply to emergency bus 2ETA.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Included additional plausibility statements to justify distractors. HCF 11/2/09 Added "feeder" to stem of question.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> <p>Lesson Plan OP-MC-ECC-NI Objective 5 Section 2.2</p>	<p>Student References Provided</p>
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QuestionBank #	KA_system	KA_number	KA_desc
1805	SYS006	K2.01	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> ECCS pumps

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2009 RO NRC Retake Examination

QUESTION 6

B

QuestionBank #	KA_system	KA_number	KA_desc
1806	SYS006	K2.04	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> ESFAS-operated valves

CURRENT

45 DAY VERSION

Which ONE (1) of the following ESF operated valves will lose power if 1EVDD is de-energized?

Which ONE (1) of the following ESF operated valves will lose power if 1EVDD is de-energized?

- A. 1NI-10B, NC Cold Leg Inj from NV
- B. 1NV-24B, NC Loop to Excess LD Hx Isol
- C. 1KC-228B, Trn B Rx Bldg Non Ess Sup Isol
- D. 1NV-142B, VCT Outlet Isolation

- A. 1NI-10B, NC Cold Leg Inj from NV
- B. 1NV-24B, NC Loop to Excess LD Hx Isol
- C. 1KC-228B, Tm B Rx Bldg Non Ess Sup Isol
- D. 1NV-142B, VCT Outlet Isolation

401-9 Comments:

006K2.04

This Q has low DV. Increase DV by adding a second valve to each choice:

- A. XZ incorrect
- B. XY correct
- C. ZY incorrect

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B

2009 RO NRC Retake Examination QUESTION 6

D.. WZ incorrect

This Q is U because of low DV
RFA 10/27/09

General Discussion

INV-24B is powered from 1EVDD. All other loads listed in the distractors are powered from 1EMXB. All of the valves listed as distractors are significant with respect to verification of proper ESF valve alignment. It is not an expectation that our operators memorize the power supplies to these valves. The information the application is required to know is that, 3 of these valves are motor operated 600 v AC valves and the correct answer is a solenoid operated air valve. The understanding of what types of valves requires system knowledge and operational knowledge.

This KA is matched because all valves listed operate automatically on ESFAS signals and the applicant must know the power supply to all valves listed to determine the correct answer.

Answer A Discussion

Incorrect. Power supply is 1EMXB1.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Power supply is 1EMXB.

Answer D Discussion

Incorrect. Power supply is 1EMXB2.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

It is not an expectation that applicant have memorized all of the power supplies to all of the ESF valves. This question as asked, requires knowledge of what type each valve is, ie, solenoid vs. motor operated. Discuss when on site. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
AP/1/A/5500/15, Loss of Vital or Aux Control Power page 107

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1806	SYS006	K2.04	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> ESFAS-operated valves

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2009 RO NRC Retake Examination

QUESTION 6

B

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2009 RO NRC Retake Examination

QUESTION 7

B

QuestionBank #	KA_system	KA_number	KA_desc
1807	SYS007	A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: (CFR: 41.5 / 45.5) <input type="checkbox"/> Maintaining quench tank water level within limits

CURRENT

Unit 1 was operating at 100% RTP when it was determined that 1NV-6 (Letdown Line Inside RB Relief) is leaking 9.0 GPM to the PRT. The 1A NCDT pump has failed and was tagged last shift.

- 1) Assuming a starting level in the PRT of 70%, what would be the indicated PRT level after 4 hours?
- 2) To which location is the PRT drained to prevent exceeding the design limit for PRT level per OP/1/A/6150/004 (Pressurizer Relief Tank)?

REFERENCE PROVIDED

- A.
 - 1) 86%
 - 2) Containment Floor and Equipment Sump
- B.
 - 1) 86%
 - 2) NCDT
- C.
 - 1) 90%
 - 2) Containment Floor and Equipment Sump
- D.
 - 1) 90%
 - 2) NCDT

45 DAY VERSION

Unit 1 was operating at 100% RTP when it was determined that 1NV-6 (Letdown Line Inside RB Relief) is leaking 9.0 GPM to the PRT.

- 1) Assuming a starting level in the PRT of 70%, what would be the indicated PRT level after 4 hours?
- 2) To which location is the PRT drained to prevent exceeding the design limit for PRT level per OP/1/A/6150/004 (Pressurizer Relief Tank)?

REFERENCE PROVIDED

- A.
 - 1) 86%
 - 2) Containment Floor and Equipment Sump
- B.
 - 1) 86%
 - 2) NCDT
- C.
 - 1) 90%
 - 2) Containment Floor and Equipment Sump
- D.
 - 1) 90%
 - 2) NCDT

401-9 Comments:

007A1.01

The containment floor and equipment sump plausibility is not justified. The distracter analysis says the floor is used sometimes but doesn't say when. Consider changing A2 and C2 to the radwaste facility or something or justify plausibility.

This Q is E until A2 and C2 are either justified or replaced.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 7

B

General Discussion

Initial PRT level is given at 70% which represents a volume of 9750 gal. With a 9 GPM input for 4 hours (240 Minutes), a total of 2160 gal. The resulting volume in the tank will be 11910 gal. Using the reference provide this new volume would represent a new indicated level of 86%. The X axis on the tank curve is graduated in divisions of 250 gal, if the candidate was off 1/2 of this value Standard allowable margin for error reading curves, on each tank level, the new derived level would be 90%.

Per station procedure OP/1/A/6150/004 (Pressurizer Relief Tank), Enc. 4.2 (Adjusting PRT level) the PRT level is lowered by draining to the NCDT via PRT Drain to the NCDT. The alternate option, via the sample line to the CF&E sump is provided in section 3.6 of this enclosure. This flowpath is very limited and would not be sufficient to prevent exceeding the design maximum level in the tank. This fact makes the choice possible and thereby established plausibility for the distracter.

KA is matched because given an input to the PRT the candidate must predict a resulting level after a stated period of time using a reference tank curve to determine this new level. "Operating the controls" knowledge is required due the required knowledge as to where to the PRT would be drained in this situation and all of the above is required in order to maintain the water level within limits.

This is a higher cognitive level question because the candidate must take the information given, interpret a tank curve and predict an outcome. He must also possess system operational knowledge. At the very least, the question requires a multi-part mental process to successfully answer.

Answer A Discussion

Incorrect: Level is correct, location to drain is wrong. Plausible because the level is correct, and the location is possible but would not used in the situation.

Answer B Discussion

CORRECT. See explanation above.

Answer C Discussion

Incorrect: Both answers are wrong. Plausible: As explained above, error reading the tank curve would provide this level and the location is possible but would not used in the situation given.

Answer D Discussion

Incorrect: First answer wrong, second is correct. Plausible: As explained above for tank level, an error reading the tank curve would provide this answer.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Distracter analysis has been revised to strengthen the argument supporting the plausibility for the CF&E flowpath option. This is a clearly stated option in the procedure and therefore is both possible and plausible. Will discuss further with Lead.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Technical Reference(s) Lesson Plan OP-MC-PS-NC, Reactor Coolant System, Rev. 31, page 35-37

Learning Objective: OP-MC-PS-NC Obj. 19

Student References Provided

U-1 Data Book Curve 7.2 (Q7)

QuestionBank #	KA_system	KA_number	KA_desc
1807	SYS007	A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: (CFR: 41.5 / 45.5) □ Maintaining quench tank water level within limits

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2009 RO NRC Retake Examination QUESTION 7

B

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2009 RO NRC Retake Examination QUESTION 8

B

QuestionBank #	KA_system	KA_number	KA_desc
1808	SYS008	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, 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) <input type="checkbox"/> High/low CCW temperature

CURRENT

The following conditions exist on Unit 2:

- A normal plant shutdown is in progress
- All NC pumps are in service
- Train A of ND cooling was placed in service 5 minutes ago
- 3 minutes ago the following alarms were received on the OAC:
 - "2A KC HX Outlet Temp Hi Hi"
 - "NC Pump Thermal Barrier KC Outlet Temp Hi" for all NCPs
 - "NC Pump Mtr Upper BRG CLR KC Outlet Temp Hi" for all NCPs
- The following readings exist on all running NCPs:
 - Motor bearing temperatures are 190°F
 - Lower radial bearings are 200°F
 - Seal outlet temperatures are 165°F

Which ONE (1) of the following completes the statement below?

Operator action in response to these conditions will be to (1) because (2).

- A. (1) reduce the KC heat load by reducing ND flow
(2) an NCP bearing temperature limit has been exceeded due to a loss of cooling flow
- B. (1) reduce the KC heat load by reducing ND flow
(2) KC HX temperatures are approaching design limits
- C. (1) immediately stop all running NCPs
(2) an NCP bearing temperature limit has been exceeded due to a loss of cooling flow
- D. (1) immediately stop all running NCPs
(2) KC HX temperatures are approaching design limits

45 DAY VERSION

The following conditions exist on Unit 2:

- A normal plant shutdown is in progress
- All NC pumps are in service
- Train A of ND cooling was placed in service 5 minutes ago
- 3 minutes ago the following alarms were received on the OAC:
 - "2A KC HX Outlet Temp Hi Hi"
 - "NC Pump Thermal Barrier KC Outlet Temp Hi" for all NCPs
 - "NC Pump Mtr Upper BRG CLR KC Outlet Temp Hi" for all NCPs
- The following readings exist on all running NCPs:
 - Motor bearing temperatures are 185°F
 - Lower radial bearings are 200°F
 - Seal outlet temperatures are 165°F

Operator action in response to these conditions will be to (1) because (2).

- A. (1) reduce the KC heat load by reducing ND flow
(2) an NCP bearing temperature limit has been exceeded due to a loss of cooling flow
- B. (1) reduce the KC heat load by reducing ND flow
(2) KC HX temperatures are approaching design limits
- C. (1) immediately stop all running NCPs
(2) an NCP bearing temperature limit has been exceeded due to a loss of cooling flow
- D. (1) immediately stop all running NCPs
(2) KC HX temperatures are approaching design limits

401-9 Comments:

008A2.03
Change motor bearing temperatures to 190. This will give C1 and D1 more plausibility.
RFA 10/27/09

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2009 RO NRC Retake Examination QUESTION 8

B

General Discussion

Explanation (Optional): In the scenario provided in this question, indications are provided in which an excessive heat load has been placed on the operating train of KC. NCP pump temperatures are elevated but have not exceeded any operational limits. To address this condition the crew will need to reduce the NC cooldown rate which will decrease the heat load on the KC system to provide additional cooling to the NCP's.

The K/A is matched because the applicant must evaluate the impact of the malfunction (Hi CCW temperature) on the system's ability to perform its design function (in this case provide cooling to the NC pumps). Based on the predicted impact to the system (design limits will be exceeded), the applicant must select the correct action to mitigate.

The question is higher cog because the candidate must predict an outcome and select an action to solve the problem. This requires using the knowledge and its meaning to solve a problem.

Answer A Discussion

Plausible: First part is correct, Lower radial bearing temperature is >195 deg with is the limit for motor bearings.

Answer B Discussion

CORRECT. See explanation above

Answer C Discussion

Plausible: Candidate may believe that NCP limits have been exceeded. The values given in the stem are close to design limits.

Answer D Discussion

Plausible Candidate may believe that NCP limits have been exceeded. The values given in the stem are close to design limits. Second part is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's comment, changed motor bearing temperature to 190°F. Also, added WOOTF question per Chief Examiner's general comments. HCF 11/02/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Technical Reference(s): Lesson Plan OP-MC-PSS-KC, Rev. 25
Lesson Plan OP-MC-PS-NCP,
Learning Objective: OP-MC-PSS-KC, Obj. 8

Student References Provided

QuestionBank #	KA_system	KA_number
1808	SYS008	A2.03

KA_desc

Ability to (a) predict the impacts of the following malfunctions or operations on the CCWS, 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) High/low CCW temperature

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2009 RO NRC Retake Examination

QUESTION 9

B

QuestionBank #	KA_system	KA_number	KA_desc
1809	SYS010	K6.04	Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: (CFR: 41.7 / 45.7) □ PRT

CURRENT

Given the following conditions on Unit 1:

- NC system pressure is 1985 PSIG and slowly decreasing due to a leaking Pressurizer Code Safety Valve (1NC-1)
- PRT pressure is currently 65 PSIG
- Discharge temperature downstream of 1NC-1 is 310°F
- Containment pressure is currently 0.1 PSIG

Which ONE (1) of the following completes the statement below?

If the PRT rupture disc fails prematurely given the conditions above, the rate of NC system depressurization will (1) AND the temperature downstream of 1NC-1 will (2) .

- A. (1) increase
 (2) remain the same
- B. (1) increase
 (2) decrease
- C. (1) increase
 (2) increase
- D. (1) remain the same
 (2) decrease

45 DAY VERSION

Given the following conditions on Unit 1:

- NC system pressure is 1985 PSIG and slowly decreasing due to a leaking Pressurizer Code Safety Valve (1NC-1)
- PRT pressure is currently 65 PSIG
- Discharge temperature downstream of 1NC-1 is 310°F
- Containment pressure is currently 0.1 PSIG

If the PRT rupture disc fails prematurely given the conditions above, the rate of NC system depressurization will (1) AND the temperature downstream of 1NC-1 will (2) .

- A. (1) increase
 (2) remain the same
- B. (1) increase
 (2) decrease
- C. (1) remain the same
 (2) remain the same
- D. (1) remain the same
 (2) decrease

401-9 Comments:

010K6.04

It's common knowledge that the Pzr relief valves discharge to the PRT. If the PRT ruptures, it will result in a lower pressure. This also is common knowledge. Therefore, distracter C is NP. Change C to increase, increase.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 9

B

General Discussion

When the PRT rupture disc fails the differential pressure across the leaking Safety Valve will increase thereby increasing the rate of leakage and the rate of depressurization. With the Safety Valve now discharging to a lower pressure (Containment atmospheric pressure), the isenthalpic throttling process will now result in a lower discharge temperature on the Safety Valve discharge line.

The KA is matched because the applicant must determine what happens to the rate of the NC system pressure decrease when the PRT rupture disc fails.

This is a comprehension level question because the applicant must evaluate a change in conditions (i.e. before and after PRT rupture disc failure) and determine the consequence to NC system leak rate and Safety Valve discharge line temperature.

Answer A Discussion

Incorrect. Part 1 is correct. Part 2 is plausible if the applicant does not comprehend that the Safety Valve is now discharging to a lower pressure when the PRT rupture disc fails.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Part 1 is correct. Part 2 is plausible if the applicant does not understand isenthalpic throttling because it is plausible to believe that an increased flowrate will result in greater heater transfer and thus an increase in temperature.

Answer D Discussion

Incorrect. Part 2 is correct. Part 1 is plausible if the applicant does not comprehend that the larger DP across the valve will result in a higher leak rate.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's comment, changed distractor "C" answers to "increase/increase". Also, revised distractor analysis to match new answers. Also, added WOOTF question per Chief Examiner's general comments. HCF 11/02/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 Lesson Plan BNT-TH03R3 Steam Properties Objective 14 page 32
 BNT-CP02R8P, Sensors and Detectors - Process Objective 16A page 46 and 47

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1809	SYS010	K6.04	Knowledge of the effect of a loss or malfunction of the following will have on the PZR PCS: (CFR: 41.7 / 45.7) □ PRT

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2009 RO NRC Retake Examination

QUESTION 10

C

QuestionBank #	KA_system	KA_number	KA_desc
1810	SYS012	K6.03	Knowledge of the effect of a loss or malfunction of the following will have on the RPS: (CFR: 41.7 / 45/7) <input type="checkbox"/> Trip logic circuits

CURRENT

Given the following:

- Reactor power is steady state at 50% RTP
- Power Range Channel N-42 has just failed LOW

Which ONE (1) of the following combinations of remaining OPERABLE channels indicate the status of the trip logic coincidence required for the High Neutron Flux Trip:

- 1) After the failure has occurred, but BEFORE Power Range Channel N-42 is removed from service?
- 2) AFTER all required I&E actions have been completed for removing Power Range Channel N-42 from service?

	<u>BEFORE</u> <u>Channel Removal</u>	<u>AFTER</u> <u>Channel Removal</u>
A.	1/3	1/3
B.	1/3	2/3
C.	2/3	1/3
D.	2/3	2/3

45 DAY VERSION

Given the following:

- Reactor power is steady state at 50% RTP
- Power Range Channel N-42 has just failed LOW
- Power Range Channels N-41, N-43, & N-44 are OPERABLE

Which ONE (1) of the following combinations of remaining OPERABLE channels indicate the status of the trip logic coincidence required for the High Neutron Flux Trip:

- 1) After the failure has occurred, but BEFORE Power Range Channel N-42 is removed from service?
- 2) AFTER all required I&E actions have been completed for removing Power Range Channel N-42 from service?

	<u>BEFORE</u> <u>Channel Removal</u>	<u>AFTER</u> <u>Channel Removal</u>
A.	1/3	1/3
B.	1/3	2/3
C.	2/3	1/3
D.	2/3	2/3

401-9 Comments:

012K6.03

The 3rd bullet is not required because they were never declared inoperable.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 10

C

General Discussion

Since N-42 has failed low, the Hi Neutron Flux Trip Logic will never receive a trip signal from that channel. Since two high flux signals are required to initiate a trip signal and there are only three channels remaining which could potential generate a high flux trip signal, the logic for a Power Range Hi Flux trip is 2/3 channels.

When the I&E actions for removing N-42 have been completed the High Flux Trip Bistable is placed in the tripped position. Since only one more (of the remaining 3) High Flux Trip Bistable signals is required to initiate a Hi Flux Trip, the logic now becomes 1/3 channels.

The KA is matched because the question requires the applicant to know how the loss of a channel will effect the RPS trip logic before and after a channel is removed from service.

This is a comprehension level question because the applicant must recall the normal trip logic from memory, must understand that with the channel failed low the trip logic is unaffected, must understand that when the channel is removed from service the high flux trip bistable is placed in the trip condition, and must associate all of those pieces of information to determine the correct answer.

Answer A Discussion

Incorrect. Plausible if the applicant confuses the channel failing low with the channel failing high in which case this answer would be correct.

Answer B Discussion

Incorrect. Plausible if the candidate confuses the channel failing low the the channel failing high AND believes that the I&E actions for removing N-42 from service will de-energize the Hi Flux Trip Bistable for that channel.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible if the candidate does not understand that the failed channel Hi Flux Trip Bistable is placed in the tripped position when I&E actions are complete for removing the channel from service.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	Comanche Peak Bank EB878

401-9 Comments RESPONSE

Per Chief Examiner's recommendation, removed third bullet. HCF 11/02/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-IC-IPE

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1810	SYS012	K6.03	Knowledge of the effect of a loss or malfunction of the following will have on the RPS: (CFR: 41.7 / 45/7) <input type="checkbox"/> Trip logic circuits

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2009 RO NRC Retake Examination QUESTION 10

C

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2009 RO NRC Retake Examination

QUESTION 11

C

QuestionBank #	KA_system	KA_number	KA_desc
1811	SYS013	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> ESFAS initiation

CURRENT

Given the following:

- An inadvertent Reactor Trip/Safety Injection has occurred due to IAE testing
- Both reactor trip breakers opened as expected

Which of the following describes the effect of pushing the SI reset pushbuttons after the safety injection actuation?

- A. After the SI timer has timed out and the SI reset pushbuttons are depressed, automatic SI reinitiation can occur.
- B. After the SI reset pushbuttons are depressed and the RTBs have been cycled, an automatic SI reinitiation can IMMEDIATELY occur.
- C. After the SI timer has timed out and the SI reset pushbuttons are depressed, only a manual SI can be initiated, automatic SI reinitiation remains blocked.
- D. After the SI reset pushbuttons are depressed and the reactor trip breakers are cycled, only a manual SI can be initiated, automatic SI reinitiation remains blocked.

45 DAY VERSION

Given the following:

- An inadvertent Reactor Trip/Safety Injection has occurred due to IAE testing
- Both reactor trip breakers opened as expected

Which of the following describes the effect of pushing the SI reset pushbuttons after the safety injection actuation?

- A. After the SI reset pushbuttons are depressed ONLY, automatic SI reinitiation can occur.
- B. After the SI timer has timed out and the SI reset pushbuttons are depressed, automatic SI reinitiation can occur.
- C. After the SI timer has timed out and the SI reset pushbuttons are depressed, only a manual SI can be initiated, automatic SI reinitiation remains blocked.
- D. After the SI reset pushbuttons are depressed and the reactor trip breakers are cycled, only a manual SI can be initiated, automatic SI reinitiation remains blocked.

401-9 Comments:

013A4.03

I don't think you need the word ONLY in A because an auto SI will NOT reoccur until the timer has timed out as in B. You can also rewrite A as follows: After the SI reset pushbuttons are depressed and the RTBs have been cycled, an auto SI reinitiation can immediately occur. (Note, this is wrong because the timer has not timed out yet)

Distracter A is NP as written.

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2009 RO NRC Retake Examination

QUESTION 11

C

RFA 10/27/09

General Discussion

Each train has a Safety Injection Reset pushbutton on the Control Board. In order to reset safety injection, one minute must have passed since the actuation (60 second timer has timed out) and the train related reactor trip breaker must be open (P-4). Following safety injection reset, only manual safety injection actuation is available. To reinstate the automatic actuation the reactor trip breakers must be reclosed.

This KA is matched because the applicant must understand the consequences of manual action taken (Ability to manually operate and/or monitor) with regards to depressing the SI reset pushbuttons and the impact on ESFAS initiation capability.

Answer A Discussion

Incorrect. Plausible because the SI timer must time out and the SI reset pushbuttons depressed to reinstate auto SI. However, the Reactor Trip breakers must also be cycled to reinstate auto SI.

Answer B Discussion

Incorrect. Plausible because this actions described would result allow for auto SI but would require the 60 second timer to time out. The word "Immediately" makes this answer incorrect.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible because this is true provided the SI timer has timed out and reactor trip breakers have not been cycled. Once the reactor trip breakers are cycled, automatic SI is reinstated.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Exam Bank Question AECCISER01

401-9 Comments RESPONSE

As suggested in the 401-9 comments, Dist A was revised and distracters A & B were reordered due to the increase in length of the the new dist A.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-ECC-ISE Objective 12 page 25

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1811	SYS013	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) □ ESFAS initiation

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2009 RO NRC Retake Examination QUESTION 12

B

QuestionBank #	KA_system	KA_number	KA_desc
1812	SYS013	K1.01	Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> Initiation signals for ESF circuit logic

CURRENT

45 DAY VERSION

Given the following on Unit 1:

- Unit is operating at 100% RTP
- Containment Pressure Channel III has been BYPASSED for testing

Which ONE (1) of the following lists the logic for a Containment Spray actuation based on the conditions above?

- A. 1/3
- B. 2/3
- C. 1/2
- D. 2/2

Given the following on Unit 1:

- Unit is operating at 100% RTP
- Containment Pressure Channel III has been BYPASSED for testing

Which ONE (1) of the following lists the logic for a Safety Injection actuation based on the conditions above?

- A. 1/3
- B. 2/3
- C. 1/2
- D. 2/2

401-9 Comments:

013K1.01
No comment at this time
RFA 10/27/09

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2009 RO NRC Retake Examination QUESTION 12

B

General Discussion

The normal logic for a Hi Containment pressure Containment Spray / Phase B is 2/4 channels. The applicant must understand that bypassing the channel means that a Hi Pressure signal from that channel will not be seen by the logic. However, two channels are still required to initiate a Containment Spray signal and there are three channels remaining which could cause the initiation. Therefore, the logic is now 2/3.

The KA is matched because it requires the applicant to know the effect of bypassing a containment pressure channel on the initiation logic for a Containment Spray signal.

Answer A Discussion

Incorrect. Plausible if the applicant confuses bypassing a channel with placing the channel in trip.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible if the applicant confuses the Containment Spray logic with the Safety Injection logic and confuses bypassing a channel with placing the channel in trip.

Answer D Discussion

Incorrect. Plausible if the applicant confuses the Containment Spray logic with the Safety Injection logic.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Question changed to use Containment Spray logic instead of the SI logic based on validation feedback results. Change approved RFA 11/12/09.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-ECC-ISE, pages 59 and 77.

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1812	SYS013	K1.01	Knowledge of the physical connections and/or cause effect relationships between the ESFAS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> Initiation signals for ESF circuit logic

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2009 RO NRC Retake Examination

QUESTION 13

C

QuestionBank #	KA_system	KA_number	KA_desc
1813	SYS022	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; 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) <input type="checkbox"/> Fan motor thermal overload/high-speed operation

CURRENT

Given the following conditions on Unit 2:

- The unit is operating at 100% RTP
- A small NC System leak occurs inside Containment
- Annunciator 1AD-9 / A8, (CONT .5 PSIG ALERT) is received
- The BOP reports that 1A VL Fan is running in LOW speed

Which ONE (1) of the following fan combinations is required in accordance with the above listed Annunciator Response Procedure?

- A. Place 1B and 1D VL Fans in LOW speed ONLY.
- B. Place 1A and 1C VL Fans in HIGH speed ONLY.
- C. Place all four VL Fans in HIGH speed.
- D. Place the 1B, 1C, and 1D VL Fans in LOW speed.

45 DAY VERSION

Given the following conditions on Unit 2:

- The unit is operating at 100% RTP
- A small NC System leak occurs inside Containment
- Containment pressure is currently 0.25 PSIG and increasing slowly

When Containment pressure reaches 0.5 PSIG, the non-operating Lower Containment Ventilation (VL) fans will (1) AND when Containment pressure reaches 1.0 PSIG, the VL fans will (2) .

Which ONE (1) of the following correctly completes the statement above?

- A. (1) start in slow speed on their normal power supply
(2) swap to slow speed on their emergency power supply
- B. (1) swap to emergency power and start in slow speed
(2) swap to high speed on their emergency power supply
- C. (1) start in high speed on their normal power supply
(2) swap to slow speed on their emergency power supply
- D. (1) start in high speed on their normal power supply
(2) swap to high speed on their emergency power supply

401-9 Comments:

022A203

Under these conditions, I am not sure that swapping to high speed on their normal power is plausible. Suggest changing "A" and "C" part (2) to swap to slow speed on their emergency power.

U because Potentially 2 NP distracters.

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2009 RO NRC Retake Examination

QUESTION 13

C

Part 2 of the KA is not met (facility identified). Use procedures to correct, control or mitigate... If you cannot meet the entire KA, you have to meet at least the second part.

CE: Reissue a new KA if necessary.

RFA 10/08/09

Revisited

A2 needs to read "will remain in slow speed"

Part 2 of the KA still not met. CAF

RFA 10/27/09

Under these conditions, I am not sure that swapping to high speed on their normal power is plausible. Suggest changing "A" and "C" part (2) to swap to slow speed on their emergency power.

U because Potentially 2 NP distracters.

Part 2 of the KA is not met (facility identified). Use procedures to correct, control or mitigate... If you cannot meet the the entire KA, you have to meet at least the second part.

CE: Reissue a new KA if necessary.

RFA 10/08/09

General Discussion

When containment pressure reaches 0.5 PSIG, all VL fans should automatically start in high speed regardless of switch position. In this particular case 0.5 PSIG has been reached and the fans have failed to automatically start. When the Operators review the Annunciator Response Procedure, they should realize that the automatic actions have failed to occur and should place all four VL fans in HIGH speed.

This K/A is met since an automatic action associated with the Containment Cooling Fans (i.e. all four fans starting in HIGH speed) has failed to occur and the Operators must take actions in accordance with the Annunciator Response Procedure to correct the problem. As a note, the Annunciator Response Procedure is the only place that the automatic start/swap of the Containment Cooling Fans is verified as occurring.

Answer A Discussion

Incorrect. Since all four fans automatically start in HIGH speed (except on their emergency power supply) when Containment pressure reaches 1 PSIG, it is plausible to believe that running 3 fans in LOW speed at 0.5 PSIG is appropriate.

Answer B Discussion

Incorrect. Since the fans should have automatically swapped to HIGH speed at 0.5 PSIG, it is plausible to believe that placing the running fans in HIGH speed is appropriate. However, all 4 fans should be placed in HIGH speed and not just the running fans.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible to believe that all the VL fans should be running in Low Speed

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2009 RO NRC Retake Examination QUESTION 13

C

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Re-wrote question as it was impossible to meet Part B of the K/A with the previous question. HCF 11/02/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 Lesson Plan OP-MC-CNT-VUL Objectives 4 & 5
 pages 31 and 39

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1813	SYS022	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CCS; 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) <input type="checkbox"/> Fan motor thermal overload/high-speed operation

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2009 RO NRC Retake Examination

QUESTION 14

A

QuestionBank #	KA_system	KA_number	KA_desc
1814	SYS025	K5 02	Knowledge of operational implications of the following concepts as they apply to the ice condenser system: (CFR: 41.5 / 45.7) <input type="checkbox"/> Heat transfer

CURRENT

Which ONE (1) of the following completes the statements below regarding the effect of operating with elevated Ice Condenser temperatures on the process of sublimation and the resulting operational implications should a high energy line break occur inside containment?

- Sublimation rates would (1).
 - Peak containment pressure would be (2).
- A. (1) increase
(2) higher
- B. (1) increase
(2) unaffected
- C. (1) decrease
(2) higher
- D. (1) decrease
(2) unaffected

45 DAY VERSION

Which ONE (1) of the following describes the effect of operating with elevated Ice Condenser temperatures on the process of sublimation and the resulting operational implications should a high energy line break occur inside containment?

- Sublimation rates would (1).
 - Peak containment pressure would be (2).
- A. (1) increase
(2) higher
- B. (1) increase
(2) lower
- C. (1) decrease
(2) higher
- D. (1) decrease
(2) lower

401-9 Comments:

025K5.02

Whether the ice sublimates or melts, the result is a higher containment temperature which yields higher pressures. Factor in melting instead of pressure. KA is not affected. B2 and D2 are NP.

This Q is U due to 2 NP distracters.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 14

A

Whether the ice sublimates or melts, the result is a higher containment temperature which yields higher pressures. Factor in melting instead of pressure. KA is not affected. B2 and D2 are NP.

General Discussion

As stated in the Ice condenser lesson plan, the process of sublimation is accelerated with prolonged operation with elevated Ice Condenser temperatures. This would result in a loss of ice inventory would decrease the total heat transfer capability of the ice condenser system. This would result in an increase in the energy remaining in the containment atmosphere during a high energy line break and a corresponding increase in the peak containment pressure.

KA is matched because the candidate must first understand the process of sublimation (Heat transfer via changing state directly from a solid to a gas). He must then understand that this would reduce the overall heat transfer capability of the ice condenser system resulting in the operational implication of a higher peak containment pressure in the event of a HELBIC.

This question is high cognitive because the understand multiple concepts and then predict the impact on plant operation.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect: See explanation above. Plausible: First part of the question is correct, second is incorrect. Should the candidate not understand the process of sublimation this could be a creditable answer.

Answer C Discussion

Incorrect: See explanation above. Plausible: It would be reasonable that the candidate would think that the ice would tend to melt at higher temps rather than sublimate. Second part is correct.

Answer D Discussion

Incorrect: See explanation above. Plausible: As described above

Job Level	Cognitive Level	QuestionType	Question Source	401-9 Comments RESPONSE
RO	Comprehension	NEW		Changed B2 and D2 from "lower" to "unaffected". Should add some degree of plausibility of these distracters. Difficult K/A need to keep question is tact. Revised wording of stem to say "Which ONE (1) of the following completes the statements..."
<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved		Development References Technical Reference(s): LP OP-MC-CNT-NF (Rev 31) Pg 13 & 59 Learning Objective: OP-MC-CNT-NF Obj 16	Student References Provided	
QuestionBank #	KA_system	KA_number	KA_desc	
1814	SYS025	K5 02	Knowledge of operational implications of the following concepts as they apply to the ice condenser system: (CFR: 41.5 / 45.7) <input type="checkbox"/> Heat transfer	

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2009 RO NRC Retake Examination QUESTION 14

A

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2009 RO NRC Retake Examination

QUESTION 15

C

QuestionBank #	KA_system	KA_number	KA_desc
1815	SYS026	A2.08	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) <input type="checkbox"/> Safe securing of containment spray when it can be done)

CURRENT

The following conditions exist on Unit 1:

- LOCA inside containment
- 1ETB has experienced a ground fault
- Auto swap to Cold Leg Recirc. has failed due to 1NI-185A (1A ND Pump Suction From Containment Sump Isol) not opening
- Attempts to manually open 1NI-185A have failed
- Control Room has implemented ECA-1.1 (Loss of Emergency Coolant Recirc)
- Containment pressure is 12 PSIG and slowly going up

Which ONE (1) of the following describes Operator actions associated with NS system operation following the receipt of "FWST Lo Lo Level?"

- A. Open 1NS-18A (A NS Pump suct from Cont Sump) and close 1NS-20A (A NS Pump Suct From FWST), '1A' NS pump remains running.
- B. Secure '1A' NS pump, close 1ND-19A (1A ND pump suct. from FWST or NC), swap NS suction to Containment Sump, restart NS pump.
- C. Secure '1A' NS pump, NS cannot be aligned to Containment Sump until 1NI-185A is open.
- D. Secure '1A' NS pump, close 1NS-20A and open 1NS-18A, restart '1A' NS pump.

45 DAY VERSION

The following conditions exist on Unit 1:

- LOCA inside containment
- 1ETB has experienced a ground fault
- Auto swap to Cold Leg Recirc. has failed due to 1NI-185A (Containment Sump Isolation Valve) not opening
- Attempts to manually open 1NI-185A have failed
- Control Room has implemented ECA-1.1 (Loss of Emergency Coolant Recirc)
- Containment pressure is 12 PSIG and slowly going up

Which ONE (1) of the following describes Operator actions associated with NS system operation following the receipt of "FWST Lo Lo Level?"

- A. Open 1NS-18A (A NS Pump suct from Cont Sump) and close 1NS-20A (A NS Pump Suct From FWST), '1A' NS pump remains running.
- B. Secure '1A' NS pump, close 1ND-19A (1A ND pump suct. from FWST or NC), swap NS suction to Containment Sump, restart NS pump.
- C. Secure '1A' NS pump, NS cannot be aligned to Containment Sump until 1NI-185A is open.
- D. Secure '1A' NS pump, close 1NS-20A and open 1NS-18A, restart '1A' NS pump.

401-9 Comments:

026A208

CAF: Do you expect the applicants to know what INI-185A is? If you state the valve nomenclature, would that give away the answer?

RFA 10/08/09

Revisited

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2009 RO NRC Retake Examination

QUESTION 15

C

The valve nomenclature was added
RFA 10/27/09

CAF: Do you expect the applicants to know what INI-185A is? If you state the valve nomenclature, would that give away the answer?
RFA 10/08/09

General Discussion

Distracter Analysis: Operator must know that at FWST lo lo level the NS pump must be secured. Required within 45 sec. Operator must realize that due to the physical arrangement on the piping, the 1A NS pump cannot take suction from the Containment Sump without INI-185A open. Also, in order to swap suction, the NS pump must be secured, suction realigned and then restarted. Additionally, INS-1A is interlocked with INI-185A such that INO-185 must be closed before INS-18A can be opened.

KA is matched because the candidate is given a situation where a malfunction has occurred which will impact the operators ability to place NS in a CLR alignment. The candidate must then predict the impact of this malfunction and understand how this condition will affect the ability the perform the appropriate procedure to mitigate this consequence. The NS pump will have to be secured due to this malfunction and while in ECA 1.1 with containment pressure <15 psig this would constitute a safe situation where the pump could be secured.

This is a higher cognitive level question because evaluate a given set of conditions and predict an outcome. This will require using the system knowledge and applying its meaning to predict the impact.

Answer A Discussion

Incorrect: See explanation above. Plausible: Valve alignment is correct therefore plausible, pump remains running is plausible because the ND pumps remain running during swap to CLR.

Answer B Discussion

Incorrect: See explanation above. Plausible: The actions listed are correct with the exception of closing IND-19A . This action is required to swap the ND pump suction to the sump, candidate could confuse this with NS suction swap

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect: See explanation above. Plausible: The actions listed would be correct if INI-185A were open.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS Bank Question ECCNSN012

401-9 Comments RESPONSE

The nomenclature for INI-185A was added to the question during validation. The version of the question sent to the Lead Examiner did not have the nomenclature.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Technical Reference(s): OP-MC-ICC-NS, rev. 30, page 15,35 and 39.

Learning Objective: OP-MC-ECC-NS, Obj. 8

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1815	SYS026	A2.08	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions,

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2009 RO NRC Retake Examination

QUESTION 15

C

use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.13) Safe securing of containment spray when it can be done)

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2009 RO NRC Retake Examination

QUESTION 16

B

QuestionBank #	KA_system	KA_number	KA_desc
1816	SYS026	2.2.12	SYS026 GENERIC Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)

CURRENT

Unit 1 is at 100% RTP with the Ops Test Group (OTG) performing PT/1/A/4208/001 A (1A NS Pump Performance Test). The OTG Technician has reached the step in this PT which directs the starting of the 1A NS pump.

Which ONE (1) of the following describes the required positions of 1NS-29A (A NS Pump Disch Cont Outside Isol) and 1NS-32A (A NS Pump Disch Cont Outside Isol) AND the required system alignment for the performance of this PT?

- A. Valves CLOSED
"A" Train NS system flowpath is through the HX and directly back to the pump suction.
- B. Valves CLOSED
"A" Train NS system flowpath is through the HX to the FWST
- C. Valves OPEN
"A" Train NS system flowpath is through the HX, through 1NS-29A and 1NS-32A, then directly back to the pump suction
- D. Valves OPEN
"A" Train NS system flowpath is through the HX, through 1NS-29A and 1NS-32A, then to the FWST

45 DAY VERSION

Unit 1 is at 100% RTP with the Ops Test Group (OTG) performing PT/1/A/4208/001 A (1A NS Pump Performance Test). The OTG Technician has reached the step in this PT which directs the starting of the 1A NS pump.

Which ONE (1) of the following describes the required positions of 1NS-29A (A NS Pump Disch Cont Outside Isol) and 1NS-32A (A NS Pump Disch Cont Outside Isol) AND the required system alignment for the performance of this PT?

- A. Valves CLOSED
"A" Train NS system flowpath is through the HX and directly back to the pump suction.
- B. Valves CLOSED
"A" Train NS system flowpath is through the HX to the FWST
- C. Valves OPEN
"A" Train NS system flowpath is through the HX and directly back to the pump suction
- D. Valves OPEN
"A" Train NS system flowpath is through the HX to the FWST

401-9 Comments:

026G2.2.12

I am not sure C2 is plausible with the valves open. Please re-evaluate this. If the disch valvs are open, a basic understanding of fig 7.1 of the reference renders this choice NP.

RFA 10/27/09

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QUESTION 16

B

General Discussion

The 1A NS pump performance test is accomplished by aligning the discharge of the 1A NS pump via the normally aligned suction to the FWST. The pump discharges to the associated HX and then downstream of the HX, a manual valve alignment is performed which directs the discharge to the FWST. Full flow capability is provided and the containment isolation valves remain closed with their associated interlocks bypassed to allow pump operation.

KA is matched because the operator must be familiar with the operational alignment required to perform this surveillance procedure. The knowledge required is specific to its performance and cannot be answered with system knowledge alone.

Answer A Discussion

Plausible: first part is correct, second part is plausible because when the ND performance test is performed the flowpath is directed back to the pump suction.

Answer B Discussion

Correct

Answer C Discussion

Plausible: The containment isolation valves are interlocked such at least one must be open to allow pump start. This interlock is bypassed by this PT. Second part is plausible as described above.

Answer D Discussion

Plausible: First part is plausible as described above and the second part is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Added the isolation valves INS-29A and INS-32A to the second part of distracters C and D to enhance plausibility.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Technical Reference(s): OP-MC-ECC-NS, Rev. 30, page 21
 PT/1/A/4208/001 A (1A NS Performance Test, Rev. 57, page 7
 Learning Objective: OP-MC-ECC-NS, Obj. 6 & 8

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1816	SYS026	2.2.12	SYS026 GENERIC Knowledge of surveillance procedures. (CFR: 41.10 / 45.13)

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2009 RO NRC Retake Examination

QUESTION 17

A

QuestionBank #	KA_system	KA_number	KA_desc
1817	SYS039	K3.04	Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> MFW pumps

CURRENT

Given the following:

- Unit 1 is at 100% RTP
- Due to a severe packing leak, the Plant SRO decides to close 1SP-1 (MAIN STEAM TO 1A CF PUMP TURB ISOL)

Assuming no additional operator actions are taken, what would be the effect of this action on the 1A FWPT operation?

The 1A FWPT would:

- A. remain in operation supplied by MSR exhaust ONLY.
- B. remain in operation but the steam supply would swap to Aux Steam ONLY.
- C. remain in operation but the steam supply would now be a combination of Aux Steam AND MSR exhaust.
- D. slow down and back out of the header due to the loss of its primary steam supply for full power operation.

45 DAY VERSION

Given the following:

- Unit 1 is at 100% RTP
- Due to a severe packing leak, the Plant SRO decides to close 1SP-1 (MAIN STEAM TO 1A CF PUMP TURB ISOL)

Assuming no additional operator actions are taken, what would be the effect of this action on the 1A FWPT operation?

The 1A FWPT would:

- A. remain in operation supplied by MSR exhaust ONLY.
- B. remain in operation but the steam supply would swap to Aux Steam ONLY.
- C. remain in operation but the steam supply would now be a combination of Aux Steam AND MSR exhaust.
- D. slow down and back out of the header due to the loss of its primary steam supply for full power operation.

401-9 Comments:

039K3.04

Since aux steam is normally isolated at 100% power, change the stem power level to 85%. This will give B and C more plausibility.
RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 17

A

General Discussion

The low pressure governor valve opens first and is supplied by the Auxiliary Steam System until the Moisture Separators Reheater (MSR) steam has sufficient capacity to supply which occurs above 80% power. The high-pressure governor is supplied by the Main Steam System and is used when the low-pressure governor is not able to meet the demand. High-pressure steam will be supplied automatically if low-pressure steam cannot maintain turbine speed. At 100% RTP the FWPT steam supply is from MSR exhaust only with the HP governor valves completely closed. With the given power level, closure of ISP-1 would have no effect on FWPT operation. Aux Steam is normally isolated at 100% power but is the primary steam supply at low power levels.

KA is matched because the candidate is being asked to evaluate the loss of the main steam supply to a operating main feed pump with the plant operating at 100%.

This is a higher cognitive level question because the candidate must evaluate a given plant condition, evaluate a change in plant lineup and predict an outcome.

Answer A Discussion

Correct.

Answer B Discussion

Plausible because AS is the primary steam supply at lower power levels and AS pressure is high enough to provide this function but procedurally not aligned at high power.

Answer C Discussion

Plausible because this would be true at lower power levels.

Answer D Discussion

Plausible because at intermediate power levels 20% to 80% power this would be a true statement.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Facility feels this distracters B and C have plenty of plausibility because both have been picked during validation. Validations scores are borderline (45%) miss rate as written, need to keep as is. (In fact, all distracters have been picked)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Technical Reference(s): OP-MC-MT-MSR Rev 17
Pg 17
Learning Objective: OP-MC-MT-MSR Obj. 2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1817	SYS039	K3.04	Knowledge of the effect that a loss or malfunction of the MRSS will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> MFW pumps

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2009 RO NRC Retake Examination

QUESTION 18

B

QuestionBank #	KA_system	KA_number	KA_desc
1818	SYS059	K3.02	Knowledge of the effect that a loss or malfunction of the MFW will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> AFW system

CURRENT

Given the following conditions on Unit 1:

- Unit is in Mode 3
- NC pressure is 1940 PSIG
- CA auto start defeat "Defeated" lights are lit.

The following sequence of events occur on Unit 1 while in Mode 3:

1. A CF isolation occurs on S/G Hi-Hi level
2. The S/G Hi-Hi level clears
3. CF isolation is reset
4. T-ave increases and NC pressure increases to 1960 PSIG

Which ONE (1) of the following describes when any CA pump(s) should have automatically started?

- A. When the SG Hi-Hi level cleared ONLY
- B. When pressure increased above 1955 PSIG ONLY
- C. Following the CF isolation reset OR when the SG Hi-Hi level cleared
- D. Following the CF isolation reset OR when pressure increased above 1955 PSIG.

45 DAY VERSION

Given the following conditions on Unit 1:

- Unit is in Mode 3
- NC pressure is 1940 PSIG
- CA auto start defeat "Defeated" lights are lit.

The following sequence of events occur on Unit 1 while in Mode 3:

1. A CF isolation occurs on S/G Hi-Hi level
2. The S/G Hi-Hi level clears
3. CF isolation is reset
4. T-ave increases and NC pressure increases to 1960 PSIG

Which ONE (1) of the following describes when (if at all) any CA pump(s) should have automatically started?

- A. Following the CF isolation reset
- B. When the S/G Hi-Hi level cleared
- C. When pressure increased above 1955 PSIG
- D. Should have remained off for these events

401-9 Comments:

059K302

Choice "C": Change P-11 to 1960 psig. This way they have to know what pressure P-11 is. This will increase plausibility and make the answer less obvious

RFA 10/08/09

Revisited

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2009 RO NRC Retake Examination

QUESTION 18

B

Additional comment:

D is NP for set of events given. For this level of exam and knowledge, failure to recall that P-11 resets is not likely. Therefore D is not plausible.

I suggest the following:

- A. Following the CF isolation reset or when the SG Hi-Hi level cleared.
- B. When the SG Hi-Hi level cleared ONLY
- C. Following the CF isolation reset or when pressure increased above 1955 psig.
- D. when pressure increased above 1955 psig ONLY

RFA 10/27/09

Choice "C": Change P-11 to 1960 psig. This way they have to know what pressure P-11 is. This will increase plausibility and make the answer less obvious

RFA 10/08/09

General Discussion

With both CF Pumps tripped, the CA Pumps would normally start. However, the CA Pump auto start has been defeated as evidenced by the "Defeated" lights being lit. When pressure increase above P-11 (1955 psig), the auto start defeat will be automatically unblocked and the CA Pumps will auto start.

The K/A is matched since the applicant must know how the Feedwater Isolation (loss or malfunction of the MFW) will affect the operation of the AFW system (i.e. AFW auto start).

Answer A Discussion

Incorrect: P-14 is defeated by CA auto start defeat

Plausible: The clearing or this signal would allow for CF pump start, candidate could confuse this with a CA permissive.

Answer B Discussion

CORRECT answer The auto start defeat will Auto RESET when above P-11 and can be manually RESET at any time.

Answer C Discussion

Incorrect: Neither action will affect CA pump operation

Plausible: Either one of these action would allow for CF pump operation, applicant may confuse CF pump permissives with CA.

Answer D Discussion

Incorrect: First part as explained above.

Plausible: CF isolation would allow for CF pump operations, second part of the answer is correct

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2003 CNS NRC Q29 (Bank 229)

401-9 Comments RESPONSE

Question revised per Ron's suggestion dated 10/27, (2nd 401-9 comments), barring additional concerns not identified in the 401-9 comments, should be OK now.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan OP-MC-CF-CA, Objectives 4 & 6 Pages 13 and 15

Student References Provided

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2009 RO NRC Retake Examination

QUESTION 18

B

QuestionBank #	KA_system	KA_number	KA_desc
1818	SYS059	K3.02	Knowledge of the effect that a loss or malfunction of the MFW will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> AFW system

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2009 RO NRC Retake Examination

QUESTION 19

A

QuestionBank #	KA_system	KA_number	KA_desc
1819	SYS059	K3.03	Knowledge of the effect that a loss or malfunction of the MFW will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> S/GS

CURRENT

Given the following conditions on Unit 1:

- Unit 1 is operating at 60% RTP
- Channel 41 of Nuclear Instrumentation fails to 120%
- "PR TO S/G PROGRAM LEVEL CHANNEL DEFEAT" switch is in the "Normal" position

Which ONE (1) of the following describes the effect this failure will have on the S/G level control system?

- A. The feedwater regulating valves on A and D SGs ONLY will open to increase the NR levels to 65%.
- B. The feedwater regulating valves will remain in the same position for all SGs.
- C. All feedwater regulating valves will open to feed all SG NR levels to 65%.
- D. The feedwater regulating valves on B and C SGs ONLY will open to increase the NR levels to 65%.

45 DAY VERSION

Given the following conditions on Unit 1:

- Unit 1 is operating at 60% RTP
- Channel 41 of Nuclear Instrumentation fails to 120%
- "PR TO S/G PROGRAM LEVEL CHANNEL DEFEAT" switch is in the "Normal" position

Which ONE (1) of the following describes the effect this failure will have on the S/G level control system?

- A. The feedwater regulating valves on "A" and "D" S/G will open to increase the levels to 65% since NI Channel 41 is now the controlling channel for these S/G's.
- B. The feedwater regulating valves will remain in the same position for all S/G's. Trip program for "A and "D" S/G's will increase.
- C. All feedwater regulating valves will open to feed all S/G levels to 65%. Since the programmed level is a "High Select" circuit, Channel 41 will be controlling.
- D. The feedwater regulating valves on "B" and "C" S/G will open to increase the levels to 65% since NI Channel 41 is now the controlling channel for these S/G's.

401-9 Comments:

059K3.03

Too much teaching in all distracters/choices. Furthermore, the second parts may give away the correct answer.

Reduce to the following:

- A. The feedwater regulating valves on A and D SGs only will open.

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2009 RO NRC Retake Examination

QUESTION 19

A

- B. The feedwater regulating valves will remain in the same position for all SGs
 - C. All feedwater regulating valves will open to feed all SG (WR or NR) levels to 65%.
 - D. The feedwater regulating valves on B and C SGs will open to increase the (WR or NR) levels to 65%.
- RFA 10/27/09

General Discussion

With the Unit initially at 60% power, the S/G program will maintain S/G levels at approximately 55%. When N41 fails high, it becomes the "High Select" controlling channel for 1A and 1D S/G level programs. The program level for A and D S/Gs will now be the 100% RTP program level or 65% NR S/G level. Therefore the feed reg valves on A and D will open to increase level to the new program level.

This question matches the KA in that a malfunction of the Main Feedwater System has occurred (Feedwater Regulating Valves opening) as a result of the failure of N41 (a malfunction of the S/G Level Control portion of the Main Feedwater System). This malfunction results in an increase in S/G levels (the affected component).

This question is Comprehension level because the applicant must associate two pieces of information (one given and one recalled from memory) to correctly answer the question. The given information is that N41 has failed high. From memory, the applicant must recall that S/G A and D program levels are controlled by the High Select of N41 and N43.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible if the S/G Level Program Select switch were in the "Defeat 41/43" Position.

Answer C Discussion

Incorrect. Plausible if the S/G Level Program Select switch were in the "Defeat 42/44" Position.

Answer D Discussion

Incorrect. Plausible if the applicant does not understand which S/G level programs are controlled by which NIs.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS Exam Bank Question #ACFIFER07

401-9 Comments RESPONSE

Question revised as suggested by Ron.
(Small change to what he suggested to distracter A) 11/2/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan OP-MC-CF-IFE Objective 6 & 10, pages 19 and 21.

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1819	SYS059	K3.03	Knowledge of the effect that a loss or malfunction of the MFW will have on the following: (CFR: 41.7 / 45.6) S/GS

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QUESTION 19

A

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QUESTION 20

B

QuestionBank #	KA_system	KA_number	KA_desc
1820	SYS061	K1.01	Knowledge of the physical connections and/or cause-effect relationships between the AFW and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> S/G system

CURRENT

Given the following on Unit 2:

- A reactor trip from 100% RTP has occurred
- The TD CA pump tripped on overspeed upon starting
- Bus 2ETA locked out

Which ONE (1) of the following describes which S/Gs are currently being fed and the associated flow rates?

- A. A and B S/Gs at 450 GPM total flow
- B. C and D S/Gs at 450 GPM total flow
- C. A and B S/Gs at 450 GPM to each S/G
- D. C and D S/Gs at 450 GPM to each S/G

45 DAY VERSION

Given the following on Unit 2:

- A reactor trip from 100% RTP has occurred
- The TD CA pump tripped on overspeed upon starting
- Bus 2ETA locked out

Which ONE (1) of the following describes which S/Gs are currently being fed and the associated flow rates?

- A. A and B S/Gs at 450 GPM total flow
- B. C and D S/Gs at 450 GPM total flow
- C. A and B S/Gs at 450 GPM to each S/G
- D. C and D S/Gs at 450 GPM to each S/G

401-9 Comments:

061K1.01
No comment at this time
RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 20

B

General Discussion

The Turbine Driven CA pump is tripped. If it were running it would feed all 4 S/Gs. 1A CA Pump normally feeds S/Gs 1A and 1B. 1B CA Pump normally feeds S/Gs 1C and 1D. With the loss of power to Emergency Bus 1ETA, the 1A CA Pump will not be running. Therefore, only 1B CA Pump will be running feeding 1C and 1D S/Gs.

Each motor driven CA Pump is capable of supplying two S/Gs at a design total flow rate of 450 GPM.

The K/A is matched because the applicant must know both the physical connections (i.e. which S/Gs are fed by which CA pumps) and the cause-effect relationship (i.e. the effect of the TD CA pump and 2ETA lockout) as a result of the malfunctions related to the CA system.

This is a comprehension level question because the applicant must associate multiple pieces of information, some given and some recalled from memory. First, the candidate must recall that with Emergency Bus 1ETA locked out, the 1A MDAFW pump will be unavailable. The candidate must then recall which S/Gs are fed from each MDAFW pump. The applicant must also recall that the rated flow for the MDAFW pumps

Answer A Discussion

Incorrect. Plausible if the applicant does not recall which S/Gs are fed by each MDAFW pump. The flowrate is correct.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible if the applicant does not recall which S/Gs are fed by each MDAFW pump. Also, the flowrate number is correct but it is total flow and not flowrate to each S/G.

Answer D Discussion

Incorrect. The S/Gs supplied are correct and the flowrate numerical value is correct but it is total flowrate and not flowrate to each S/G.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2006 NRC Q21 (CNS NRC Bank 98)

401-9 Comments RESPONSE

Question considered SAT for submittal, no changes

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-CF-CA Objectives 4, 7, & 8 page 13

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1820	SYS061	K1.01	Knowledge of the physical connections and/or cause-effect relationships between the AFW and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> S/G system

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QUESTION 20

B

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QUESTION 21

C

QuestionBank #	KA_system	KA_number	KA_desc
1821	SYS062	K4.10	Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) <input type="checkbox"/> Uninterruptable ac power sources

CURRENT

Given the following conditions:

- The loads supplied by Static Inverter 1KU are being supplied by their alternate power source due to an automatic transfer on low inverter output voltage.

Which ONE (1) of the following describes the response of the Auxiliary Control Power system when inverter voltage is restored to normal?

- A. No response, loads must be manually restored to the inverter.
- B. No response, the alternate power source must be deenergized and the loads will then auto swap back to the inverter.
- C. Loads will auto swap back to the inverter if the inverter voltage remains stable for 30 seconds.
- D. Loads will auto swap back to the inverter as soon as inverter overcurrent is detected to be less than 120%.

45 DAY VERSION

Given the following conditions:

- The loads supplied by Static Inverter 1KU are being supplied by their alternate power source due to an automatic transfer on low inverter output voltage.

Which ONE (1) of the following describes the response of the Auxiliary Control Power system when inverter voltage is restored to normal?

- A. No response, loads must be manually restored to the inverter.
- B. No response, the alternate power source must be deenergized and the loads will then auto swap back to the inverter.
- C. Loads will auto swap back to the inverter if the inverter voltage remains stable for 30 seconds.
- D. Loads will auto swap back to the inverter as soon as inverter voltage returns to normal.

401-9 Comments:

062K4.10

Need boundary for D. As written, D could be potentially correct since if it takes 30 s or so to return to normal. Suggestion for D: Loads will auto swap back to the inverter as soon as inverter over current is detected to be less than 120%

RFA 10/27/09

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QUESTION 21

C

General Discussion

The static automatic transfer switch will automatically swap auxiliary control power from its alternate source back to the inverter is the condition that caused the auto-swap has cleared (in this case low voltage) and conditions are stable for 30 seconds.

This KA is met because the applicant must understand the system design features which provide for automatic transfer of auxiliary control power from its normal source (static inverter) to its backup source and vice versa.

Answer A Discussion

Incorrect. Plausible because in some cases loads must be manually transferred back to their normal power supply.

Answer B Discussion

Incorrect. Plausible because loads will automatically transfer back to normal power supply. However, the alternate source does not have to be de-energized to cause this to happen.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible because the loads will automatically transfer back to the inverter. However it is based on voltage and not on overcurrent.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank Question ELEPK032

401-9 Comments RESPONSE

Changed Distractor 'D' per Chief Examiner's recommendation. HCF 11/03/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-EP-EPK Objective 16 pages 25 and 27.

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1821	SYS062	K4.10	Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) <input type="checkbox"/> Uninterruptable ac power sources

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QUESTION 22

C

QuestionBank #	KA_system	KA_number	KA_desc
1822	SYS063	K2.01	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Major DC loads

CURRENT

Which ONE (1) of the following receives power from 250VDC Auxiliary Power System?

- A. D/G Fuel Oil Booster Pump AND FWPT "A" Emergency Oil Pump
- B. FWPT "A" Emergency Oil Pump(s) AND Reactor Trip Switchgear Control
- C. Turbine Emergency Bearing Oil Pump AND Turbine Backup Vapor Extractor
- D. Turbine Emergency Bearing Oil Pump AND D/G Fuel Oil Booster Pump

45 DAY VERSION

Which ONE (1) of the following receives power from 250VDC Auxiliary Power System?

- A. D/G Fuel Oil Booster Pump
- B. Reactor Trip Switchgear Control
- C. Turbine Emergency Bearing Oil Pump
- D. Power Operated Relief Valves Solenoids (both NC and SV systems)

401-9 Comments:

063K2.01

This Q has low DV. Suggested fix:

- A. D/G Fuel Oil Booster Pump and FWPT A Emergency Oil Pump(s)
- B. FWPT A Emergency Oil Pump(s) and Reactor Trip Switchgear Control
- C. Turbine Emergency Bearing Oil Pump and Turbine Backup Vapor Extractor(s)
- D. Turbine Emergency Bearing Oil Pump and D/G Fuel Oil Booster Pump

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QUESTION 22

C

This Q is U because

General Discussion

All loads are DC loads, D/G booster pump comes from 1DGDA. And rx trip switchgear and PORVs come from 125VDC vital
 The K/A is matched because the applicant is required to know and differentiate from memory the power supplies to major DC components.

Answer A Discussion

Incorrect. Plausible because it is supplied by DC power.

Answer B Discussion

Incorrect. Plausible because it is supplied by DC power.

Answer C Discussion

CORRECT

Answer D Discussion

Incorrect. Plausible because it is supplied by DC power.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	2008 CNS NRC Q48 (Bank 554)

401-9 Comments RESPONSE

Question revised to add multiple choices for each answer per Ron's suggestion. Should be good to go.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> <p>Lesson Plan OP-MC-EL-EPJ Objective 4</p>	<p>Student References Provided</p>
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QuestionBank #	KA_system	KA_number	KA_desc
1822	SYS063	K2.01	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Major DC loads

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2009 RO NRC Retake Examination

QUESTION 23

C

QuestionBank #	KA_system	KA_number	KA_desc
1823	SYS064	A3.01	Ability to monitor automatic operation of the ED/G system, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Automatic start of compressor and ED/G

CURRENT

Which ONE (1) of the following correctly completes the statement below?

The Diesel Generator Starting Air compressors are designed to automatically maintain the Starting Air Header pressure between (1). During an automatic start of the Diesel Generator, the Starting Air solenoid will open to supply the diesel for (2) or until Diesel Generator speed is >40%.

- A. (1) 225 – 235 PSIG
(2) 10 seconds
- B. (1) 210 – 225 PSIG
(2) 10 seconds
- C. (1) 225 – 235 PSIG
(2) 20 seconds
- D. (1) 210 – 225 PSIG
(2) 20 seconds

45 DAY VERSION

The Diesel Generator Starting Air compressors are designed to automatically maintain the Starting Air Header pressure between (1). During an automatic start of the Diesel Generator, the Starting Air solenoid will open to supply the diesel for (2) or until Diesel Generator speed is >40%.

Which ONE (1) of the following correctly completes the statement above?

- A. (1) 225 – 235 PSIG
(2) 10 seconds
- B. (1) 220 – 250 PSIG
(2) 10 seconds
- C. (1) 225 – 235 PSIG
(2) 20 seconds
- D. (1) 220 – 250 PSIG
(2) 20 seconds

401-9 Comments:

064A3.01

Move the WOOTF statement to the top.

CAF: Look at A1 and C1 and make sure that they are not subsets of B1 and D1 because 235 psig is between both choices. You might consider using an actual value where the limits have to be applied instead.

RFA 10/27/09

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2009 RO NRC Retake Examination QUESTION 23

C

General Discussion

The Diesel Generator Starting Air compressors will automatically cycle to maintain the starting air headers pressurized between 225-235 psig. When the Diesel Generator gets an auto start signal, four starting air solenoids open to supply the diesel for 20 seconds or until Diesel Generator speed is greater than 40%.

The K/A is matched because in order to monitor the automatic operation of the EDG starting air compressors and the automatic operation of the EDG, the applicant must know the setpoints at which the EDG starting air compressor will automatically start and stop and must know the amount of time the EDG starting air solenoids will remain open on an auto start.

Answer A Discussion

Incorrect. Pressure is correct. Second part is plausible if applicant does not recall the amount of time air is supplied to the diesel.

Answer B Discussion

Incorrect. Both parts incorrect. Plausible if the applicant does not recall air compressor auto starts or time that diesel generators are supplied starting air.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. First part incorrect. Second part the time is correct. Plausible if the applicant does not recall air compressor auto starts.

Job Level	Cognitive Level	Question Type	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's suggestion, changed B1 and D1 to 235-250 PSIG so that A1 and C1 would not be a subset of B1 and D1.
HCF 11/03/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-DG-DGA Objective 5 page 25 and Objective 8 page 31

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1823	SYS064	A3.01	Ability to monitor automatic operation of the ED/G system, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Automatic start of compressor and ED/G

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2009 RO NRC Retake Examination

QUESTION 24

A

QuestionBank #	KA_system	KA_number	KA_desc
1824	SYS064	K6.08	Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: (CFR: 41.7 / 45.7) <input type="checkbox"/> Fuel oil storage tanks

CURRENT

The following on Unit 1:

- A unisolable leak develops on the 1A Fuel Oil Storage Tank (FOST)
- At 0800 hours 1A FOST level is 41,250 gal
- At 0930 hours 1A FOST level is 40,000 gal

Assuming the leak rate from the FOST remains constant, when is the EARLIEST time that 1A D/G will fail to meet the LCO requirements for TS 3.8.3 (Diesel Fuel Oil and Starting Air)?

REFERENCE PROVIDED

- A. 1006 hours
- B. 1136 hours
- C. 1935 hours
- D. 2105 hours

45 DAY VERSION

The following on Unit 1:

- A unisolable leak develops on the 1A Fuel Oil Storage Tank (FOST)
- At 0800 hours 1A FOST level is 41,250 gal
- At 0930 hours 1A FOST level is 40,000 gal

Assuming the leak rate from the FOST remains constant, when will the 1A D/G fail to meet the LCO requirements for TS 3.8.3 and what action is required?

REFERENCE PROVIDED

- A. 0954 hours
Immediately declare the associated DG inoperable
- B. 1006 hours
Immediately declare the associated DG inoperable
- C. 0954 hours
Restore fuel oil level to within limits within 48 hours.
- D. 1006 hours
Restore fuel oil level to within limits within 48 hours

401-9 Comments:

064K608

Since ref is provided, and there is no mention of problems with DG starting air, the second part of A and B are NP. Why not change to 7 days and put a particulate bullet in the stem that is within the limits.

Unless I am missing something, this Q is U because of 2 NP distracters.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 24

A

General Discussion

In accordance with Tech Spec 3.8.3 Diesel FOST level must be ≥ 39500 gal. If FOST is < 39500 gal but > 31600 gal a 48 hour LCO is entered to refill the FOST.

The leak rate from the tank = $(41250 - 40000) / 90 = 13.89$ GPM

LCO 3.8.3 Condition A will be entered when FOST decreases to less than 39,500 gal. With a 13.89 gpm leak rate it will take approximately 36 minutes for FOST level to reach 39500 gal.

$(40000 - 39500 \text{ gal}) / 13.89 \text{ gpm} = 36 \text{ min.}$

36 min from 0930 would be 1006.

The FOST leak will eventually lead to a condition where FOST level will place the unit in an LCO condition. Therefore, the K/A is matched.

This is an analysis level question because the applicant must evaluate Tech Specs to determine the level at which the Diesel Generator operability will be effected, then calculate a leak rate, and based on the leak rate determine the time at which Diesel Generator operability will be effected and the action that must be taken.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible if the applicant uses the change in level from 41250 to 39500 gal and the correct leak rate but starts at correct time of 0930. This would yield the time given.

Answer C Discussion

Incorrect. Plausible if the applicant believes that LCO requirements are not met until the low level of 31600 gal is reached. The time given is correct using the correct leak rate.

Answer D Discussion

Incorrect. Plausible if applicant believes LCO requirements not met until 31600 gal level is reached. Using the difference between 41250 and 31600 gal with the correct leak rate from 0930 hours will yeild this time.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Changed question such that "Immediately declare the DG inoperable" is plausible.
HCF 11/03/09

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> <p>Technical Specification 3.8.3, Diesel Fuel Oil and Starting Air Lesson Plan OP-MC-DG-DGA page 65</p>	<p>Student References Provided</p> <p>Tech Spec 3.8.3 (Q24)</p>
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QuestionBank #	KA_system	KA_number	KA_desc
1824	SYS064	K6.08	Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: (CFR: 41.7 / 45.7) <input type="checkbox"/> Fuel oil storage tanks

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2009 RO NRC Retake Examination QUESTION 24

A

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2009 RO NRC Retake Examination

QUESTION 25

B

QuestionBank #	KA_system	KA_number	KA_desc
1825	SYS073	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Check source for operability demonstration

CURRENT

While performing daily surveillance checks on 1EMF-33 (Condenser Air Ejector Exhaust), you determine that the OPERATE light is OFF. The Control Room Supervisor asks you to perform an operability check of 1EMF-33.

Which ONE (1) of the following is required to be performed for this check per PT/1/A/4600/003 B (Daily Surveillance Items)?

- A. Have RP perform a setpoint check ONLY.
- B. Have RP perform a source check ONLY.
- C. Start the associated sample pump for this EMF AND have RP perform a setpoint check.
- D. Start the associated sample pump for this EMF AND have RP perform a source check.

45 DAY VERSION

While performing daily surveillance checks on 1EMF-33 (Condenser Air Ejector Exhaust), you determine that the OPERATE light is OFF. The Control Room Supervisor asks you to perform an operability check of 1EMF-33.

Which ONE (1) of the following is required to be performed for this check per PT/1/A/4600/003 B (Daily Surveillance Items)?

- A. Have RP perform a setpoint check.
- B. Have RP perform a source check.
- C. Verify the sample pump is in operation.
- D. Verify the correct sample point is selected.

401-9 Comments:

073A403

In accordance with the reference, it appears that a source check is required not a setpoint check. Please re-verify correct answer..

The stem ask for a requirement. The word "Ensure" (distracters "C" and "D") are NOT "requirements". These two distracters will be immediately eliminated.

U because "C" and 'D" are NP

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2009 RO NRC Retake Examination

QUESTION 25

B

RFA 10/08/09

Revisited

The stem asks for a requirement. C and D are “verify” steps. A and B are performance steps. If the stem asked for a requirement, then the applicant will rule out C and D because they are NOT performance steps.

RFA 10/27/09

In accordance with the reference, it appears that a source check is required not a setpoint check. Please reverify correct answer..

The stem ask for a requirement. The word “Ensure” (distractors “C” and “D”) are NOT “requirements”. These two distracters will be immediately eliminated.

U because “C” and ‘D” are NP

RFA 10/08/09

General Discussion

EMF-33 is a process radiation that monitors the gaseous activity levels released to the unit vent by the condenser air ejector exhaust. As part of the daily surveillance checks performed by the reactor operators, the OPERATE light associated with the EMF control module is verified to be illuminated. If it is dark the PT being performed requires a source check to be performed. A successful source check ensures operability and usually results in the recovery of the operate light.

KA is matched because know that due to indications on the EMF control module located in the C/R (Operate light dark) the question examines ability to monitor and understand that because of this indication, a source check is required.

Answer A Discussion

Incorrect: See explanation above. Plausible: In order for this EMF to perform its design function of detection of a primary to secondary leak, the setpoints would need to be correct therefore this action is plausible but not required by this PT.

Answer B Discussion

CORRECT: See explanation above

Answer C Discussion

Incorrect: See explanation above. Plausible: This would be a correct action if this EMF had an sample pump which it does not. Plausible because we have other EMFs that do which are checked by the PT.

Answer D Discussion

Incorrect: See explanation above. Plausible: This would be a correct action if this EMF had sample point selection capability. Plausible because we have other EMFs that do which are checked by the PT.

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QUESTION 25

B

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	2006 NRC Q25 (Bank 102)

401-9 Comments RESPONSE

Version sent to Ron had wrong answer listed as correct, OK in access program. Removed "ensure" from dist C & D and replaced with "Verify". Not sure what his problem is with this question, need to discuss during review. Also changed dist C & D 11/3

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Technical Reference(s): PT/1/A/4600/003 B (Daily Surveillance Items) Rev 128

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1825	SYS073	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Check source for operability demonstration

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2009 RO NRC Retake Examination

QUESTION 26

B

QuestionBank #	KA_system	KA_number	KA_desc
1826	SYS076	K4.06	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41/7) <input type="checkbox"/> Service water train separation

CURRENT

Given the following conditions:

- Unit 1 @ 100% RTP
- 1B RN Pump is in service with suction aligned to the Low Level Intake
- A spurious Safety Injection Signal occurs (on both trains)

Which ONE (1) of the following describes the alignment of the RN Pumps after the spurious Safety Injection?

- A. RN Pump 1A is running with suction from SNSWP and RN Pump 1B is running with suction from the Low Level Intake.
- B. RN Pump 1A running with suction from the Low Level Intake and RN Pump 1B is running with suction from the SNSWP.
- C. RN Pump 1A is running with suction from the RC Crossover and RN Pump 1B is running with suction from the SNSWP.
- D. RN Pump 1B is running with suction from the RC Crossover and RN Pump 1A is running with suction from the SNSWP.

45 DAY VERSION

Given the following conditions:

- Unit 1 @ 100% RTP
- 1B RN Pump is in service with suction aligned to the Low Level Intake
- A spurious Safety Injection Signal occurs (on both trains)

Which ONE (1) of the following describes the alignment of the RN Pumps after the spurious Safety Injection?

- A. RN Pump 1A is running with suction from SNSWP and RN Pump 1B is running with suction from the Low Level Intake.
- B. RN Pump 1A running with suction from the Low Level Intake and RN Pump 1B is running with suction from the SNSWP.
- C. RN Pump 1A is running with suction from the RC Crossover and RN Pump 1B is running with suction from the SNSWP.
- D. RN Pump 1A and RN Pump 1B are running with suction from the SNSWP.

401-9 Comments:

076K4.06

With train separation being common knowledge, I do not believe that D is plausible since the suction is common from SNSWP.

Replace D.

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 26

B

General Discussion

When an SI signal occurs the RN trains are automatically aligned to split the trains and 1A RN pump is started taking a suction from the LLI while 1B RN pump takes suction from the SNSWP.

The KA is match because the applicant must be familiar with the RN system automatic alignment during an SI which provides for train separation which assures an RN supply to the units from at least one train.

Answer A Discussion

Incorrect. Plausible as both RN pumps do get an auto-start signal and the Low Level Intake and SNSWP are the correct suction sources for the RN system. However, the alignment is incorrect.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible since both RN pumps get an auto start signal on an SI and the RC Crossover is one of the suction sources for the RN system. However, it is not a suction source during an SI.

Answer D Discussion

Incorrect. Plausible since both RN pumps get an auto start signal on an SI and the RC Crossover is one of the suction sources for the RN system. However, it is not a suction source during an SI.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	CNS NRC Bank Question 1046 (Never Used)

401-9 Comments RESPONSE

Per Lead examiner suggestion, distracter D was replaced with a reversed version of distracter C. 11/03

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-PSS-RN, Objective 8 Section 3.2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1826	SYS076	K4.06	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41/7) <input type="checkbox"/> Service water train separation



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QUESTION 27

D

QuestionBank #	KA_system	KA_number	KA_desc
1827	SYS078	A3.01	Ability to monitor automatic operation of the IAS, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Air pressure

CURRENT

Due to a leak on the VI system the Unit 1 OATC observes the following indications:

- 1AD-12 C1 (VIMS Lo Pressure) is LIT
- 0VIP-5090 (VI/VS Press) dropped to a lowest reading of 86 PSIG and is now 89 PSIG and increasing.

Which ONE (1) of the following describes automatic actions which have occurred as a result of the indicated pressure transient?

- A. G and H VI Compressors Auto Started ONLY
- B. 1VI-820 (VI to VS Supply) Auto Closed ONLY
- C. 1VI-820 Auto Closed AND 1VI-1812 (VI Dryer Bypass Vlv) has Auto Opened
- D. G and H VI Compressors Auto Started AND 1VI-820 (VI to VS Supply) Auto Closed

45 DAY VERSION

Due to a leak on the VI system the Unit 1 OATC observes the following indications:

- 1AD-12 C1 (VIMS Lo Pressure) is LIT
- 0VIP-5090 (VI/VS Press) dropped to a lowest reading of 86 PSIG and is now 89 PSIG and increasing.

Which ONE (1) of the following describes automatic actions which have occurred as a result of the indicated pressure transient?

- A. G and H VI Compressors Auto Started ONLY
- B. 1VI-820 (VI to VS Supply) Auto Closed ONLY
- C. 1VI-820 Auto Closed AND 1VI-1812 (VI Dryer Bypass Vlv) has Auto Opened
- D. G and H VI Compressors Auto Started AND 1VI-820 (VI to VS Supply) Auto Closed

401-9 Comments:

078A3.01
No comment at this time
RFA 10/27/09

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QUESTION 27

D

General Discussion

At a decreasing VI pressure of 90 PSIG the following actions occur:
 1VI-820 (VI to VS Supply) Auto closes
 G and H (Diesel VI compressors) Auto Start
 If VI pressure continues to decrease to 85 PSIG, 1VI-1812 (VI Dryer Bypass) will OPEN.

KA is matched because the candidate, given information obtained from monitoring a trend of VI pressure indications located in the control room, what automatic actions have occurred associated with the Instrument Air system.

This is an analysis level question because the applicant is given set of plant conditions and must recall a setpoint from memory to determine if a set of automatic actions should have occurred.

Answer A Discussion

Incorrect: Answer is not complete and incorrect due to the ONLY designation. Plausible because this action would have occurred but is not complete.

Answer B Discussion

Incorrect: Answer is not complete and is incorrect due to the ONLY designation. Plausible because this action would have occurred but is not complete.

Answer C Discussion

Incorrect: 1VI-1812 will not open until pressure decreased to 85 PSIG. The lowest pressure given in the stem is 86 PSIG. Plausible: First part of the answer is correct, candidate may believe 1VI-1812 actuates with the other components at 90 PSIG.

Answer D Discussion

Correct as described above.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan OP-MC-SS-VI Objective 7 Section 1.2.10 page 67 and Objective 2 Section 1.3.1 page 89
 ARP for 1AD-12 CI (VI/VS Low pressure)

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1827	SYS078	A3.01	Ability to monitor automatic operation of the IAS, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Air pressure

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QUESTION 28

B

QuestionBank #	KA_system	KA_number	KA_desc
1828	SYS103	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> ESF slave relays

CURRENT

Given the following conditions on Unit 1:

- A Steam Break has occurred inside Containment
- Containment pressure is 3.5 PSIG and decreasing

Which ONE (1) of the following describes the MINIMUM action(s) required to allow restoration of Component Cooling Water to the NC pumps?

- A. Reset Phase A ONLY
- B. Reset Phase B ONLY
- C. Reset Phase A AND Phase B ONLY
- D. Reduce Containment pressure below 3.0 PSIG AND reset Phase A AND Phase B

45 DAY VERSION

Given the following conditions on Unit 1:

- A Steam Break has occurred inside Containment
- Containment pressure is 3.5 PSIG and decreasing

Which ONE (1) of the following describes the MINIMUM action(s) required to allow restoration of Component Cooling Water to the NC pumps?

- A. Reset Phase A ONLY
- B. Reset Phase B ONLY
- C. Reset Phase A AND Phase B
- D. Reduce Containment pressure below 3.0 PSIG AND reset Phase A AND Phase B

401-9 Comments:

103A4.03
 If C was correct, D would be also.
 Modify C or D or add an ONLY to C.
 RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 28

B

General Discussion

KC to the NC pump motor coolers isolates on a Phase B signal. The Phase B can be reset with the signal still present. When the Phase B reset pushbuttons are depressed, control of valves that close on a Phase B signal is regained.

This KA is matched because the applicant must understand the operation of Containment Isolation Phase B valves (operated by ESF slave relays) and how control is regained for those valves after a Phase B actuation to correctly answer the question.

Answer A Discussion

Incorrect. Plausible if the applicant does not understand that until the Phase B is reset they do not have control over the valves which were operated by the Phase B signal.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible because frequently SI, Phase A and Phase B signals are reset simultaneously during the performance of Emergency Procedures.

Answer D Discussion

Incorrect. It is plausible to assume that since a Phase B signal occurs at 3.0 PSIG that Containment pressure must be reduced to less than 3.0 PSIG to be able to reset Phase B. However, it may be reset at any time.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Exam Bank Question ECCISEN04

401-9 Comments RESPONSE
 Added "ONLY" to distracter C as requested by lead examiner. 11/03

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References	Student References Provided
OP-MC-ECC-ISE Objective 13 page 31	

QuestionBank #	KA_system	KA_number	KA_desc
1828	SYS103	A4.03	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> ESF slave relays

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QUESTION 29

A

QuestionBank #	KA_system	KA_number	KA_desc
1829	SYS002	K3.03	Knowledge of the effect that a loss or malfunction of the RCS will have on the following: (CFR: 41.7) <input type="checkbox"/> Containment

CURRENT

The following conditions exist on Unit 1:

- Unit 1 is at 100% RTP with a small NC system leak in Containment
- Containment pressure is 0.28 PSIG and slowly increasing
- The BOP places all VL fans in High Speed

Which ONE (1) of the following correctly describes the impact of this action on the following Containment parameters?

- A. Containment Pressure AND Temperature will DECREASE.
- B. Containment Pressure will INCREASE. Containment Temperature will DECREASE.
- C. Containment Pressure will DECREASE ONLY.
- D. Containment Temperature will DECREASE ONLY.

45 DAY VERSION

The following conditions exist on Unit 1:

- Unit 1 is at 100% RTP with a small NC system leak in Containment
- Containment pressure is 0.28 PSIG and slowly increasing
- The BOP places all VL fans in High Speed

Which ONE (1) of the following correctly describes the impact of this action on the following Containment parameters?

- A. Containment Pressure AND Temperature will DECREASE.
- B. NO IMPACT on either Containment Temperature OR Pressure.
- C. NO IMPACT on Containment Temperature. Containment pressure will DECREASE.
- D. NO IMPACT on Containment Pressure. Containment Temperature and will DECREASE.

401-9 Comments:

002K3.03

"No impact" (distracter B) is not plausible especially with fans in high speed.

Replace B

RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 29

A

General Discussion

The student must recognize that high speed effects more than just the air flow for the AHU. The student must determine what the higher air flow will impact.

The KA is matched because under the conditions where a small NC system leak has occurred in containment, the applicant must determine the effect on containment conditions when additional ventilation flow is provided to containment.

Answer A Discussion

CORRECT

Answer B Discussion

Incorrect. If the student does not understand the relationship of temperature and pressure to increased cooling from the VL units.

Answer C Discussion

Incorrect. If the student does not understand the relationship of temperature and pressure or the methodology of dehumidification he will assume only the pressure goes down.

Answer D Discussion

Incorrect. If the student does not understand the relationship of temperature and pressure or the methodology of dehumidification he will assume only the temperature goes down.

Job Level	Cognitive Level	QuestionType	Question Source	401-9 Comments RESPONSE
RO	Comprehension	BANK	2006 CNS NRC Q55 (Bank 661)	Distracter B was replaced as requested by Lead Examiner. 11/03

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References	Student References Provided
OP-MC-CNT-VUL pages 11, 15, and 17	

QuestionBank #	KA_system	KA_number	KA_desc
1829	SYS002	K3.03	Knowledge of the effect that a loss or malfunction of the RCS will have on the following: (CFR: 41.7) <input type="checkbox"/> Containment

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2009 RO NRC Retake Examination

QUESTION 30

B

QuestionBank #	KA_system	KA_number	KA_desc
1830	SYS014	A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: (CFR: 41.5 / 45.5) <input type="checkbox"/> Control rod position indication on control room panels

CURRENT

45 DAY VERSION

Given the following plant conditions:

- Reactor Startup in progress
- Control Board Annunciator 1AD-2 / D9 (RPI at Bottom Rod Drop) is LIT.

Which ONE (1) One of the following describes the EARLIEST rod configuration at which 1AD-2 / D9 will clear during the startup?

- A. All Shutdown Bank rods >6 steps.
- B. All Shutdown Bank rods withdrawn AND Control Bank 'A' rods >6 steps.
- C. All Shutdown Bank rods AND Control Bank 'A' rods fully withdrawn.
- D. All Shutdown Bank rods withdrawn AND all Control Bank rods >6 steps.

Given the following plant conditions:

- Reactor Startup in progress

IMMEDIATELY after the Control Board Annunciator 1AD-2 D9 (RPI at Bottom Rod Drop) extinguishes, the Digital Rod Position Indication (DRPI) displays will indicate which ONE (1) of the following?

- A. All Shutdown Bank rods >6 steps.
- B. All Shutdown Bank rods withdrawn and Control Bank 'A' rods >6 steps.
- C. All Shutdown Bank rods and Control Bank 'A' rods fully withdrawn.
- D. All Shutdown Bank rods withdrawn and ALL Control Bank rods >6 steps.

401-9 Comments:

014A1.02
 A is a subset of B.
 If C was correct so would D.
 Psychometrics need to be addressed.
 RFA 10/27/09

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2009 RO NRC Retake Examination

QUESTION 30

B

General Discussion

The "RPI at Bottom Rod Drop" clears when all Shutdown Bank rods are withdrawn and Control Bank 'A' rods are >6 steps.

Difficult K/A match as there are no controls associated with the DRPI system to operate which could cause a change in parameters or prevent exceeding design limits. The closest K/A match possible is related to the DRPI indications in the Control Room as the system is operated. The "RPI at Bottom Rod Drop" annunciator was chosen since when it clears the indication for a rod being dropped is now enabled. Additionally, once the rod drop alarm is enabled, if a rod remains on the bottom as the other rods in that bank are withdrawn (>6 steps) the annunciator would alarm to alert the operator and potentially prevent exceeding design limits on the fuel (i.e. peaking factors).

Answer A Discussion

Incorrect. Plausible because >6 steps is the correct setpoint for the alarm to clear.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible because the Shutdown Banks being withdrawn is correct and clearing the alarm is associated with withdrawal of Control Bank 'A'. However, it is >6 steps withdrawn and not fully withdrawn.

Answer D Discussion

Incorrect. Plausible because the Shutdown Banks being withdrawn is correct and the setpoint (>6 steps) is correct. However, it is the first bank (Control Bank 'A') and not all Control Banks being withdrawn >6 steps that clears the alarm.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Exam Bank Question ICEDA022

401-9 Comments RESPONSE

Revised stem to more clearly define a time line to address psychometric issues raised by the Lead Examiner.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-IC-EDA Objectives 7 & 9 page 33

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1830	SYS014	A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: (CFR: 41.5 / 45.5) <input type="checkbox"/> Control rod position indication on control room panels

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QUESTION 31

C

QuestionBank #	KA_system	KA_number	KA_desc
1831	SYS017	K6.01	Knowledge of the effect of a loss or malfunction of the following ITM system components: (CFR: 41.7 / 45.7) <input type="checkbox"/> Sensors and detectors

CURRENT

Given the following conditions on Unit 1:

- Unit is operating at 100% RTP
- It is discovered that ONLY three (3) Core Exit Thermocouples (CETs) are OPERABLE in core Quadrant 2

Which ONE (1) of the following describes the status of CETs in Quadrant 2 and the requirements of Tech Spec 3.3.3 (PAM Instrumentation) at the time of discovery based on these conditions?

REFERENCE PROVIDED

- A. Both channels of CETs are INOPERABLE. Immediately restore one channel to OPERABLE.
- B. Both channels of CETs are INOPERABLE. Restore one channel to OPERABLE within 7 days.
- C. One channel of CETs is INOPERABLE ONLY. Restore required channel to OPERABLE within 30 days.
- D. One channel of CETs is INOPERABLE ONLY. Initiate the actions of T.S. 5.6.7 immediately.

45 DAY VERSION

Given the following conditions on Unit 1:

- Unit is operating at 100% RTP
- It is discovered that ONLY three (3) Core Exit Thermocouples (CETs) are OPERABLE in core Quadrant 2

Which ONE (1) of the following describes the status of CETs in Quadrant 2 and the requirements of Tech Spec 3.3.3 (PAM Instrumentation) if any, based on these conditions?

REFERENCE PROVIDED

- A. Both channels of CETs are OPERABLE. No further actions required.
- B. Both channels of CETs are INOPERABLE. Restore one channel to OPERABLE within 7 days.
- C. One channel of CETs is INOPERABLE. Restore required channel to OPERABLE within 30 days.
- D. One channel of CETs in INOPERABLE. Initiate the actions of T.S. 5.6.7 immediately.

401-9 Comments:

017K601
I do not see where "A" is plausible given the circumstances.
Replace "A" or prove plausibility.
RFA 10/08/09
CAF: Must demonstrate plausibility

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2009 RO NRC Retake Examination

QUESTION 31

C

RFA 10/27/09

I do not see where "A" is plausible given the circumstances.
 Replace "A" or prove plausibility.
 RFA 10/08/09

General Discussion

Tech Spec 3.3.3, PAM Instrumentation requires channels per core quadrant be operable in MODES 1, 2, and 3 with two operable detectors per channel.

The KA is matched because the applicant must take a given set of conditions and apply technical specifications to determine the operability of the system and the required actions. In doing so, the applicant must demonstrate that they know the difference between an operable detector and an operable channel.

Answer A Discussion

Incorrect. Plausible if the applicant does not understand that with 3 detectors operable, there has to be one operable channel..

Answer B Discussion

Incorrect. Plausible if the applicant does not understand that with 3 detectors operable, there has to be one operable channel. The action is correct.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible because one channel is inoperable. However, there is no information to imply that the LCO time has been exceeded.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

The distracter analysis is fine as written, should be able to convince Ron that this one is plausible. No Changes, will discuss during review. (See comments for better explanation)

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> Lesson Plan OP-MC-IC-ICM Objective 19 Tech Spec 3.3.3, PAM Instrumentation	<p>Student References Provided</p> Copy of TS 3.3.3 (Q31)
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QuestionBank #	KA_system	KA_number	KA_desc
1831	SYS017	K6.01	Knowledge of the effect of a loss or malfunction of the following ITM system components: (CFR: 41.7 / 45.7) <input type="checkbox"/> Sensors and detectors

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2009 RO NRC Retake Examination QUESTION 31

C

FOR REVIEW ONLY - DO NOT DISTRIBUTE

2009 RO NRC Retake Examination

QUESTION 32

A

QuestionBank #	KA_system	KA_number	KA_desc
1832	SYS029	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; 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) □ Startup operations and the associated required valve lineups

CURRENT

Given the following conditions on Unit 2:

- Unit is in Mode 5
- Containment personnel airlocks are currently in service
- VP Train B is being placed in service
- Containment pressure begins to increase at 0.1 PSIG per minute
- An Operator in the plant reports that supply and exhaust flow rates indicate flow is balanced

Which ONE (1) of the following is the probable cause of the Containment pressure increase and how can it be stabilized per OP/1/A/6450/015 (Containment Purge System)?

- A. VP SUPPLY AIR FLOW indication is reading LOWER than actual flow. Supply flow to Containment must be DECREASED.
- B. VP EXHAUST AIR FLOW indication is reading HIGHER than actual flow. Exhaust flow from Containment must be DECREASED.
- C. VP SUPPLY AIR FLOW indication is reading HIGHER than actual flow. Supply flow to Containment must be INCREASED.
- D. VP EXHAUST AIR FLOW indication is reading LOWER than actual flow. Exhaust flow from Containment must be INCREASED.

45 DAY VERSION

Unit 2 has entered Mode 5 for a refueling outage. Containment personnel airlocks are currently in service. VP Train B is being placed in service.

- Containment pressure begins to increase at 0.1 PSIG per minute
- An Operator in the plant reports that supply and exhaust flow rates indicate flow is balanced

Which ONE (1) of the following is the probable cause of the Containment pressure increase and how can it be stabilized?

- A. VP SUPPLY AIR FLOW indication is reading LOWER than actual flow. Supply flow to Containment must be DECREASED.
- B. VP EXHAUST AIR FLOW indication is reading HIGHER than actual flow. Exhaust flow from Containment must be DECREASED.
- C. VP SUPPLY AIR FLOW indication is reading HIGHER than actual flow. Supply flow to Containment must be INCREASED.
- D. VP EXHAUST AIR FLOW indication is reading LOWER than actual flow. Exhaust flow from Containment must be INCREASED.

401-9 Comments:

029A2.03

Identify the procedure that must be used to support the second part of the KA. and how can it be stabilized as stated in procedure _____.

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 32

A

General Discussion

The system is placed in service per OP/1/A/6450/015 (Containment Purge System) Enclosure 4.2 (VP System Startup) Step 3.24.2 states directs the operator the check the Total Supply and Exhaust Air flow equal to prevent placing containment vessel under a positive or negative pressure. It then provides guidance to adjust the airflow as needed.

More air is being supplied to containment than is being exhausted which has resulting in an increase in containment pressure. This has been caused by the fact that 1VPPG9140 Supply Air Flow is indicating low or 1VPPG9250 Exhaust Air Flow is indicating high and the subsequent flow balance based on the erroneous indication is admitting more air to containment than is being exhausted. To correct the imbalance, supply air flow must be decreased or exhaust air must be increased.

This KA is matched because the applicant must evaluate and adverse condition (containment pressure increasing) that has resulted from operation of the Containment Purge system during startup of the system and determine what actions must be taken to correct the problem.

This is a comprehension level question because the applicant must analyze the given indications, determine what is causing the containment pressure increase, and determine what erroneous indications could have resulted in an imbalance in the supply and exhaust flows.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. First part could be correct. However, if Exhaust flow was indicating higher than actual the correct action would be to increase exhaust flow to balance the Supply and Exhaust flows.

Answer C Discussion

Incorrect. First part incorrect. Containment pressure would be decreasing if actual supply flow was < indicated. Second part is incorrect. Increasing supply flow or decreasing exhaust flow would be the correct action for containment pressure decreasing.

Answer D Discussion

Incorrect. The first part is incorrect. If exhaust flow was reading lower than actual flow, containment pressure would be decreasing. Increasing exhaust flow would correct this problem.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2006 NRC Q61 (Bank 667)

401-9 Comments RESPONSE

Procedue added to the stem of the question. The procedure and the reference section which provides this guidance was added to the distracter analysis the question reference folder.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-CNT-VP Objective 2 & 4 Section 3.1.2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1832	SYS029	A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the Containment Purge System; 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) □ Startup operations and the associated required valve lineups

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QUESTION 32

A

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QUESTION 33

C

QuestionBank #	KA_system	KA_number	KA_desc
1833	SYS034	A3.03	Ability to monitor automatic operation of the Fuel Handling System, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> High flux at shutdown

CURRENT

Given the following conditions:

- Reactor is in MODE 6
- Core reload is in progress
- Source range instrument N31 has read approximately 80 CPS for the past hour
- Electronic noise from a welder inadvertently caused N31 to reach 3000 CPS for 30 seconds

Which ONE (1) of the following describes the correct plant response?

- A. If a VQ release is in progress, it should be secured.
- B. The Containment Purge Supply and Exhaust dampers close ONLY.
- C. The Containment Evacuation alarm sounds.
- D. A Containment Ventilation Isolation actuates.

45 DAY VERSION

Given the following conditions:

- Reactor is in MODE 6
- Core reload is in progress
- Source range instrument N31 has read approximately 80 CPS for the past hour
- Electronic noise from a welder inadvertently caused N31 to reach 3000 CPS for 30 seconds

Which ONE (1) of the following describes the correct plant response?

- A. If a VQ release is in progress, it should be secured.
- B. The Containment Purge Supply and Exhaust dampers close ONLY.
- C. The Containment Evacuation alarm sounds.
- D. A Containment Ventilation Isolation actuates.

401-9 Comments:

034A303
Revisited
No comment at this time
RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 33

C

No comment at this time
RFA 10/08/09

General Discussion

If the 'High Flux at Shutdown' is unblocked on the affected source range instrument which it would be required to be in Mode 6 during core alterations, an increase in count rate in excess of .5 decades above background would result in the actuation of the containment evacuation alarm. A related alarm which would result in a containment evacuation alarm would be a Trip 2 from on the containment radiation monitors, 1EMF 38,39 & 40. This would also result in a containment ventilation signal which in turn isolate a VQ release, VP release and secure the containment floor & equipment sump pumps.

It is not possible to completely match this KA at MNS because there is no automatic action associated with the fuel handling equipment affected by a high flux shutdown alarm. A high flux at shutdown alarm would actuate a containment evacuation alarm which would require fuel handling activities to be suspended, equipment to be placed in a safe configuration and the fuel handling crew to leave containment. With this in mind, the question is testing the candidates ability to monitor what should have occurred in the event of a high flux at shutdown alarm.

This is an analysis level question since the applicant is given a set of plant conditions and is required to recall from memory the setpoint for high flux at shutdown to determine what automatic actions should have occurred.

Answer A Discussion

Incorrect: A VQ release be unaffected. Plausible: If the candidate believes the high flux condition described should have resulted in a containment ventilation isolation signal then this would be a correct answer

Answer B Discussion

Incorrect: A VP release would be unaffected. Plausible: . If the candidate believes the high flux condition described should have resulted in a containment ventilation isolation signal then this would be a correct answer

Answer C Discussion

CORRECT: See explanation above

Answer D Discussion

Incorrect: Containment sump pumps would be unaffected. Plausible If the candidate believes the high flux condition described should have resulted in a containment ventilation isolation signal then this would be a correct answer.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS Exam Bank Question AICENBR05

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Lesson Plan IC-ENB Rev 27 Pg 19

Learning Objective: OP-MC-IC-ENB Obj # 4

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1833	SYS034	A3.03	Ability to monitor automatic operation of the Fuel Handling System, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> High flux at shutdown

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QUESTION 33

C

.....

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QUESTION 34

C

QuestionBank #	KA_system	KA_number	KA_desc
1834	SYS045	K4.13	Knowledge of MT/G system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) <input type="checkbox"/> Overspeed protection

CURRENT

Which ONE (1) of the following best describes the overspeed protection for the Main Turbine?

- A. Electrical trip at 103% and mechanical trip at 113%.
- B. Electrical trip at 111% and mechanical trip at 113%.
- C. Mechanical trip at 110% and electrical trip at 111%.
- D. Mechanical trip at 110% and electrical trip at 115%.

45 DAY VERSION

Which ONE (1) of the following best describes the overspeed protection for the Main Turbine?

- A. Electrical trip at 103% and mechanical trip at 113%.
- B. Electrical trip at 111% and mechanical trip at 113%.
- C. Mechanical trip at 110% and electrical trip at 111%.
- D. Mechanical trip at 110% and electrical trip at 115%.

401-9 Comments:

045K4.13
No comment at this time
RFA 10/28/09

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2009 RO NRC Retake Examination QUESTION 34

C

General Discussion

The mechanical overspeed trip mechanism trips the Main Turbine at 110%. The electrical overspeed device trips the Main Turbine at 111%.
 The K/A is matched because the applicant must know the setpoints for the Main Turbine overspeed protection trips.

Answer A Discussion

Incorrect. The mechanical overspeed trip is correct. An electrical trip at 103% is plausible since the OPC overspeed protection actuates at 103%.

Answer B Discussion

Incorrect. The electrical overspeed trip is correct. A mechanical overspeed trip at 113% is plausible if the applicant confuses the Main Turbine trip with the EDG Overspeed trip.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. The mechanical overspeed trip is correct. An electrical overspeed trip at 115% is plausible if the candidate confuses the Main Turbine trip with the SSF Diesel Overspeed trip.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	CNS NRC Exam Bank 1048 (Never Used)

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> <p>OP-MC-MT-MT Objective 22</p>	<p>Student References Provided</p>
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QuestionBank #	KA_system	KA_number	KA_desc
1834	SYS045	K4.13	Knowledge of MT/G system design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) <input type="checkbox"/> Overspeed protection

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2009 RO NRC Retake Examination

QUESTION 35

A

QuestionBank #	KA_system	KA_number	KA_desc
1835	SYS055	K1.06	Knowledge of the physical connections and/or cause-effect relationships between the CARS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> PRM system

CURRENT

The following conditions exist on Unit 2:

- 2A S/G has developed a 200 GPD tube leak
- 2EMF-33 (CSAE Discharge) Trip 2 light is illuminated

Which ONE (1) of the following describes the discharge flowpath for the Condenser Steam Jet Air Ejectors (CSAE) AND what occurs as a result 2EMF-33 counts reaching Trip 2?

- A. The CSAEs discharge to the Unit Vent. Annunciator ONLY.
- B. The CSAEs discharge to the Unit Vent. Annunciator AND CSAE discharge flowpath isolates.
- C. The CSAEs discharge to the Turbine Building roof. Annunciator ONLY.
- D. The CSAEs discharge to the Turbine Building roof. Annunciator AND CSAE discharge flowpath isolates.

45 DAY VERSION

The following conditions exist on Unit 2:

- 2A S/G has developed a 200 GPD tube leak
- 2EMF-33 (CSAE Discharge) Trip 2 light is illuminated

Which ONE (1) of the following describes the discharge flowpath for the Condenser Steam Jet Air Ejectors (CSAE) AND what occurs as a result 2EMF-33 counts reaching Trip 2?

- A. The CSAEs discharge to the Unit Vent. Annunciator ONLY.
- B. The CSAEs discharge to the Unit Vent. Annunciator AND CSAE discharge flowpath isolates.
- C. The CSAEs discharge to the Turbine Building roof. Annunciator ONLY.
- D. The CSAEs discharge to the Turbine Building roof. Annunciator AND CSAE discharge flowpath isolates.

401-9 Comments:

055K1.06
No comment at this time
RFA 10/28/09

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2009 RO NRC Retake Examination QUESTION 35

A

General Discussion

The CSAEs discharge to the Unit Vent. In the past, the CSAEs discharged to the Turbine Building roof and the discharge swapped to the Unit Vent on a IEMF-33 Trip 2 condition. However, that automatic action has been defeated and the CSAEs now continuously discharge to the Unit Vent. IEMF-33 now only performs a monitoring function with no automatic actions.

The K/A is met because the candidate must be understand the discharge flowpath of the CARS (Physical connection) and the effect of an alarm associated with the PRM which monitors this system.

Answer A Discussion

CORRECT

Answer B Discussion

.Incorrect. Correct discharge path. The PRM control function is plausible because it used to work this way and this is true of all of the other PRR's that monitor a flowpath which discharges directly to the environment.

Answer C Discussion

Incorrect. Discharge flow path is plausible since the discharge at one time did go to the turbine building roof. The second part of the question is correct.

Answer D Discussion

Incorrect. Discharge flow path is plausible as explained above. The PRM control function is plausible because it used to work this way and this is true of all of the other PRR's that monitor a flowpath which discharges directly to the environment.

Job Level	Cognitive Level	Question Type	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-MT-ZM Objective 4 Section 2.2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1835	SYS055	K1.06	Knowledge of the physical connections and/or cause-effect relationships between the CARS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) <input type="checkbox"/> PRM system

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2009 RO NRC Retake Examination

QUESTION 36

B

QuestionBank #	KA_system	KA_number	KA_desc
1836	SYS068	2.4.50	SYS068 GENERIC Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

CURRENT

Units 1 and 2 were operating at 100% RTP with a WMT release in progress. Given the following:

- Annunciator 1RAD1 C5 (EMF 49 Liquid Waste Disch Hi Rad) is in alarm.
- 1WP-37 (Liquid Waste to RC Cntrl) indicates OPEN.
- 1WP-35 (WMT & VUCDT to RC Cntrl) indicates OPEN.
- 1WM-46 (0EMF-49 Outlet Hi Rad Shutoff Isol) indicates CLOSED.

Concerning the 0EMF-49 RP86A Digital Module, which ONE (1) of the following statements correctly describes the status of the associated indicator lights and the required operator actions?

- A. Yellow Light ONLY - LIT
Ensure 1WP-35 and 1WM-46 are closed on 1MC-11.
- B. Yellow Light AND Red Light - LIT
Ensure 1WP-35 and 1WM-46 are closed on 1MC-11.
- C. Yellow Light ONLY - LIT
Ensure 1WP-37 and 1WP-35 are closed on 1MC- 11.
- D. Yellow Light AND Red Light - LIT
Ensure 1WP-37 and 1WP-35 are closed on 1MC- 11.

45 DAY VERSION

Units 1 and 2 were operating at 100% RTP with a WMT release is in progress. Given the following:

- Annunciator 1RAD1 C5 (EMF 49 Liquid Waste Disch Hi Rad) is in alarm.
- 1WP-37 (Liquid Waste to RC Cntrl) indicates OPEN.
- 1WP-35 (WMT & VUCDT to RC Cntrl) indicates OPEN.
- 1WM-46 (0EMF-49 Outlet Hi Rad Shutoff Isol) indicates CLOSED.

Concerning the 0EMF-49 RP86A Digital Module, which ONE (1) of the following statements correctly describes the status of the associated indicator lights and the required operator actions?

- A. Amber Light ONLY - LIT
Ensure 1WP-35 and 1WM-46 are closed on 1MC-11.
- B. Amber Light AND Red Light - LIT
Ensure 1WP-35 and 1WM-46 are closed on 1MC-11.
- C. Amber Light ONLY - LIT
Ensure 1WP-37 and 1WP-35 are closed on 1MC- 11
- D. Amber Light AND Red Light - LIT
Ensure 1WP-37 and 1WP-35 are closed on 1MC- 11

401-9 Comments:

068G2.4.50
 Stem: Delete the word "is."
 The reference provided does not support answer and choices.
 Facility demonstrate and provide proper reference during review.
 RFA 10/28/09

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2009 RO NRC Retake Examination QUESTION 36

B

General Discussion

Alarm given in the stem of this question is caused by a Trip 2 associated 0EMF-49. The EMF digital module has a red led with would be illuminated if the Trip 2 setpoint were to be reached. The yellow LED is for a Trip 1. ARP for this annunciator directs the operator to ensure 1WP-35 and 1WM-46 are closed.

KA is matched because candidate must know how to verify from the a liquid rad waste alarm is valid and then determine the required controls which need to be operated in order to respond to the alarm per the associated Alarm Response Procedure.

Answer A Discussion

Plausible if the candidate believes that the amber light indicates Trip 2, second part of the question is correct.

Answer B Discussion

CORRECT

Answer C Discussion

Plausible: first part as described above, second because one of the valves is correct, the other is closed by a different EMF for a similar liquid waste release.

Answer D Discussion

Plausible: First part is correct, second is plausible as described above.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Per Chief Examiner comment removed "is" from stem of question and included references to support the answer and choices. HCF 11/03/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Technical Reference(s): OP-MC-WE-EMF, Rev 19
pages 35, 57, 59, 111, & 113
OP/1/A/6100/010 Q Pg 28

Learning Objective: OP-MC-MC-EMF, Obj. 3

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1836	SYS068	2.4.50	SYS068 GENERIC Ability to verify system alarm setpoints and operate controls identified in the alarm response manual. (CFR: 41.10 / 43.5 / 45.3)

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2009 RO NRC Retake Examination

QUESTION 37

A

QuestionBank #	KA_system	KA_number	KA_desc
1837	SYS071	A4.14	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> WDGS status alarms

CURRENT

Given the following:

- Unit 1 is operating at 100% RTP
- Unit 2 is refueling
- Unit 1 is releasing a minimally decayed Waste Gas Decay Tank
- A significant packing leak starts on isolation valve 1WG-160, (WG Decay Tank Outlet to Unit Vent Control)

Which ONE (1) of the following correctly describes the automatic actions which will ensure that the leak is contained and filtered?

- A. 1EMF-35 (Unit Vent Part Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans AND 1EMF-41 (Aux Bldg Vent Hi Rad) automatically aligns the Auxiliary Building ventilation filter trains.
- B. 1EMF-41 (Aux Bldg Vent Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans AND 1EMF-36 (Unit Vent Gas Hi Rad) automatically closes 1WG-160.
- C. 1EMF-36 (Unit Vent Gas Hi Rad) automatically closes 1WG-160 AND 1EMF-35 (Unit Vent Part Hi Rad) automatically aligns the Auxiliary Building ventilation filter trains.
- D. 0EMF-50 (Waste Gas Disch Hi Rad) automatically closes 1WG-160 AND 1EMF-41 (Aux Bldg Vent Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans.

45 DAY VERSION

Given the following:

- Unit 1 is operating at 100% RTP
- Unit 2 is refueling
- Unit 1 is releasing a minimally decayed Waste Gas Decay Tank
- A significant packing leak starts on isolation valve 1WG-160, (WG Decay Tank Outlet to Unit Vent Control)

Which ONE (1) of the following correctly describes the automatic actions which will ensure that the leak is contained and filtered?

- A. 1EMF-35 (Unit Vent Part Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans AND 1EMF-41 (Aux Bldg Vent Hi Rad) automatically aligns the Auxiliary Building ventilation filter trains.
- B. 1EMF-41 (Aux Bldg Vent Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans AND 1EMF-36 (Unit Vent Gas Hi Rad) automatically closes 1WG-160.
- C. 1EMF-36 (Unit Vent Gas Hi Rad) automatically closes 1WG-160 AND 1EMF-35 (Unit Vent Part Hi Rad) automatically aligns the Auxiliary Building ventilation filter trains.
- D. 0EMF-50 (Waste Gas Disch Hi Rad) automatically closes 1WG-160 AND 1EMF-41 (Aux Bldg Vent Hi Rad) automatically stops the Auxiliary Building ventilation unfiltered exhaust fans.

401-9 Comments:

071A4.14

The KA says to operate and/or monitor in the CR. Rad alarms are a form of monitoring. KA is met.

No additional comments at this time

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 37

A

General Discussion

The release of radioactive gas into the Auxiliary Building will be picked up by the Auxiliary Building Ventilation System which discharges to the plant vent. The Unit 1 Low Range Particulate Vent Monitor (EMF 35) should alarm which will automatically stop the Auxiliary Building Unfiltered Exhaust Fans. The Auxiliary Building Ventilation Monitor (EMF 41) should also alarm which will place the Auxiliary Building Ventilation Filter system in service.

There are no specific WGDS status alarms in the Main Control Room. Therefore, an exact match for this KA is difficult. The closest match possible is to test applicant's ability to evaluate conditions related to the WGDS and determine how the status of the WGDS will change based on radiation monitor alarms (in the Main Control Room) and automatic actions associated with those alarms.

This is a higher cognitive level because the candidate must comprehend the physical location of the leak and based on that location analyze the given answers to determine which automatic actions will mitigate the consequences of the leak.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect: EMF 41 does not automatically stop these fans. Plausible if the candidates do not recognize that this is not an automatic action for EMF 41 but for EMF 35/37.

Answer C Discussion

Incorrect: EMF 35 does not realign ventilation filters. Plausible if applicant does not recognize this. Also, EMF 36 can close 1WG-160. But, since it's setpoint is high enough to allow the release to occur, EMF 36 will not alarm.

Answer D Discussion

Incorrect. EMF 50 will not get to Trip 2 because it is set for the activity being released, and EMF 41 does not automatically stop these fans. Plausible as these are automatic actions for the EMF monitors.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS NRC Bank 771 / 2009 NRC Question 49

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
OP-MC-WE-EMF, rev. 29, page 29 Objective 3

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1837	SY5071	A4.14	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> WGDS status alarms

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2009 RO NRC Retake Examination

QUESTION 37

A

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2009 RO NRC Retake Examination

QUESTION 38

A

QuestionBank #	KA_system	KA_number	KA_desc
1838	SYS075	K2.03	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Emergency/essential SWS pumps

CURRENT

I&E has requested that the 1B Nuclear Service Water Pump breaker be racked out for lubrication.

To which ONE (1) of the following locations should an Operator be dispatched to rack out the breaker?

- A. 1ETB
- B. 1ELXB
- C. 1TB
- D. 1EMXB

45 DAY VERSION

Which ONE (1) of the following is the power supply to 1B Nuclear Service Water Pump?

- A. 1ETB
- B. 1ELXB
- C. 1TB
- D. 1EMXB

401-9 Comments:

075K2.03

If 1TB supplies power to 1ETB, then C is also a potentially correct answer. The stem is not specific enough.

This Q is U because of potentially two correct answers.

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 38

A

General Discussion

The IB Nuclear Service Water Pump is powered from emergency bus 1ETB.

The K/A is matched because the applicant must know the power supply for the Nuclear Service Water pumps.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible because it is the correct unit and correct train and 1ETB is supplied from 1TD which is supplied by 1ATB.

Answer C Discussion

Incorrect. Plausible because it is the correct unit and 1ETB can be supplied from 1TB.

Answer D Discussion

Incorrect. Plausible because it is the correct unit and correct train and 1EMXB is a safety-related load center which is supplied from 1ETB.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank Question PSSRN006

401-9 Comments RESPONSE

Per Chief Examiner's comment, question was revised to be more specific to eliminate the possibility of two correct answers. HCF
11/03/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

OP-MC-PSS-RN Objective 3
Page 21

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1838	SYS075	K2.03	Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Emergency/essential SWS pumps

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2009 RO NRC Retake Examination

QUESTION 39

D

QuestionBank #	KA_system	KA_number	KA_desc
1839	EPE007	2.4.2	EPE007 GENERIC Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

CURRENT

Given the following:

- Unit 1 was operating at 100% RTP
- A Reactor Trip occurs due to the loss of Bus 1TA
- NC system temperature is 569°F
- The 1A S/G NR level peaked at 82% and is decreasing

Which ONE (1) of the following describes the CURRENT plant status based on the conditions above?

- A. Main Feed Pump turbines are tripped
Bank 1 Condenser Dump valves are modulated open
- B. Main Feed Pump turbines are in MANUAL at 2800 RPM
Bank 1 Condenser Dump valves are tripped open
- C. Main Feed Pump turbines are tripped
Bank 1 Condenser Dump valves are tripped open
- D. Main Feed Pump turbines are in MANUAL at 2800 RPM
Bank 1 Condenser Dump valves are modulated open

45 DAY VERSION

Given the following:

- Unit 1 was operating at 100% RTP
- A Reactor Trip occurs due to the loss of Bus 1TA
- NC system temperature is 569°F

Which ONE (1) of the following describes the CURRENT plant status based on the conditions above?

- A. Main Feed Pump turbines are tripped
Bank 1 Condenser Dump valves are modulated open
- B. Main Feed Pump turbines are in MANUAL at 2800 RPM
Bank 1 Condenser Dump valves are tripped open
- C. Main Feed Pump turbines are tripped
Bank 1 Condenser Dump valves are tripped open
- D. Main Feed Pump turbines are in MANUAL at 2800 RPM
Bank 1 Condenser Dump valves are modulated open

401-9 Comments:

EPE007G2.4.2

The KA match is OK for actions that should have occurred on EOP entry.

“Main feed pump turbines are tripped” is not plausible without something in the stem that might drive the applicant to thinking so. Add something in the stem like a failed annunciator that might elude the applicant to thinking so.

This Q is U because of two NP distracters.

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2009 RO NRC Retake Examination

QUESTION 39

D

RFA 10/28/09

General Discussion

On a reactor trip, the Main Feed Pump turbines will go to Manual Speed control with a setting of 2800 rpm (rollback hold). With NC system temperature at 569°F, this is 12°F above no-load T-ave. The turbine trip controller portion of the Steam Dump control system will modulate the Bank 1 Condenser Dump valves open until NC system T-ave is 14.4°F above no-load T-ave (557°F) at which point the Bank 2 dump valves will receive a trip open signal.

There is no direct correlation for automatic actions, interlocks, or setpoints associated with EOP entry conditions. Closest match to this K/A is to ask automatic actions that should have occurred on EOP entry (in this case a Reactor Trip) given a specific set of plant conditions.

This is an analysis level question as it required the applicant to associate multiple pieces of information both calculated and recalled from memory to correctly answer the question. The applicant must first determine that the CF pumps should be in rollback hold and not tripped based on the difference between their response on a reactor trip and SI (or other CF pump trip scenarios). The applicant must then determine that there is a 12°F delta-T between T-ave and no-load T-ave and recall from memory that on the Plant Trip Controller, with less than a 14.4°F delta-T the Bank 1 Steam Dump valves will be modulated open and not tripped open. The applicant must recall the difference in setpoints between the Load Rejection Controller and Plant Trip Controller as the setpoint for Bank 1 trip open on the Load Rejection Controller is 8.1°F.

Answer A Discussion

Incorrect. Main Feed Pump turbine trip is plausible as the turbines will trip on an S/G Hi-Hi with a setpoint of 83%. (1A peaked at 82%). Second part of answer is correct.

Answer B Discussion

Incorrect. Plausible because first part is correct and with the current delta-T, the Bank 1 Condenser Dump valves would be tripped open if control was on the Load Rejection Controller.

Answer C Discussion

Incorrect. Main Feed Pump turbine trip is plausible as the turbines will trip on an S/G Hi-Hi with a setpoint of 83%. (1A peaked at 82%). Bank 1 Condenser Dumps would be tripped open if control was on the Load Rejection Controller.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Stem revised to add a possible challenge to S/G Hi Hi Level (P-14) in order to provide plausibility to the main feed pump tripped distracters. Revised distracter analysis.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Lesson Plan OP-MC-STM-IDE pages 25, 29, and 31
 Lesson Plan OP-MC-CF-CF pages
 19 Lesson Plan OP-MC-CF-IWE
 page 29

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1839	EPE007	2.4.2	EPE007 GENERIC Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

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2009 RO NRC Retake Examination

QUESTION 39

D

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2009 RO NRC Retake Examination

QUESTION 40

A

QuestionBank #	KA_system	KA_number	KA_desc
1840	APE008	AK1.01	Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Thermodynamics and flow characteristics of open or leaking valves

CURRENT

Unit 1 is in Mode 3 at full temperature and pressure. The crew has entered AP/1/A/5500/011 (Pressurizer Pressure Anomalies) due to Pressurizer pressure decreasing very slowly.

- Pressurizer pressure is 2150 PSIG
- PRT pressure is 2 PSIG

Given the above conditions, determine which ONE (1) of the following would indicate a leaking PORV and the state of the fluid in the PORV discharge?

REFERENCE PROVIDED

	<u>PORV Discharge Temperature</u>	<u>State of the Effluent</u>
A.	200-240°F	Wet Vapor
B.	200-240°F	Saturated Vapor
C.	240-280°F	Wet Vapor
D.	240-280°F	Saturated Vapor

45 DAY VERSION

Unit 1 is in Mode 3 at full temperature and pressure. The crew has entered AP/1/A/5500/011 (Pressurizer Pressure Anomalies) due to Pressurizer pressure decreasing very slowly.

- Pressurizer pressure is 2150 PSIG
- PRT pressure is 2 PSIG

Given the above conditions, determine which ONE (1) of the following would indicate a leaking PORV and the state of the fluid in the PORV discharge?

REFERENCE PROVIDED

	<u>PORV Discharge Temperature</u>	<u>State of the Effluent</u>
A.	200-240°F	Wet Vapor
B.	200-240°F	Saturated Vapor
C.	240-280°F	Wet Vapor
D.	240-280°F	Saturated Vapor

401-9 Comments:

APE008AK1.01

Double jeopardy with Q 9: This Q is not double jeopardy with Q 9 because 9 dealt with a ruptured PRT. This Q deals with the usage of the mollier diagram. I am researching the SRO ONLY aspect of this.

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2009 RO NRC Retake Examination

QUESTION 40

A

General Discussion

Required Reference is steam table.

This question is associated with TMI. Per the TMI lesson plan:

It was clear from the operator's understanding of the PZR PORV discharge temperature and the indications of saturation/superheated fluid in the hot leg, that operator knowledge of thermodynamics needed to be drastically improved.

At 0520 the operators obtain a printout of PZR Safety and PORV discharge temperatures showing 232°F and 283°F respectively, but the operators still believe the PORV to be closed. For some time the PORV had been leaking prior to this day. The PORV leakage had been accepted as a normal part of operation (i.e. workaround). The temperature on the discharge of the PZR PORV had indicated what would be seen for PORV open or leaking since the PORV had started leaking. The operators believed the discharge temperature would increase to PZR temperature if the PORV actually opened.

A Pressurizer pressure of 2150 psig (2165 psia) corresponds to a Saturated Vapor Enthalpy of 1125 BTU/lbm. This Enthalpy undergoing a throttling process discharging to a PRT at a pressure of 2 psig (17 psia)

This KA is matched since the applicant must know how to use the Mollier diagram to determine the thermodynamic characteristics of the fluid entering the PRT.

This is an analysis level because the applicant must evaluate the given conditions using the Mollier diagram to determine the correct temperature and state of the fluid.

Answer A Discussion

Correct: This pressure results in an enthalpy of ~1135. The intersection of the PRT pressure results in a saturation temperature of 200-240

Answer B Discussion

Incorrect. Plausible as this temperature would be obtained if the student followed the entropy line from the PRT pressure to the saturation curve.

Answer C Discussion

Incorrect. Plausible if the applicant follows the entropy line from the PRT press to the saturation curve.

Answer D Discussion

Incorrect. Plausible as this temperature would be obtained if they follow the entropy line from the PRT press to the saturation curve.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2006 NRC Q2 (Bank 608)

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

THFFLO07
OP-CN-II-TMI

Student References Provided

Steam Tables (Q40)

QuestionBank #	KA_system	KA_number	KA_desc
1840	APE008	AK1.01	Knowledge of the operational implications of the following concepts as they apply to a Pressurizer Vapor Space Accident: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Thermodynamics and flow characteristics of open or leaking valves

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QUESTION 40

A

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2009 RO NRC Retake Examination

QUESTION 41

B

QuestionBank #	KA_system	KA_number	KA_desc
1841	APE015/017	AK2.08	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: (CFR 41.7 / 45.7) <input type="checkbox"/> CCWS

CURRENT

Given the following conditions on Unit 1:

- Seal Injection AND Thermal Barrier Cooling have been lost to all NCPs

Which ONE (1) of the following describes the OPERATIONAL IMPLICATIONS associated with this condition?

- A. NCP operational limits will be exceeded and NCPs will have to be secured unless seal injection is restored within 30 minutes.
- B. NCP operational limits will be exceeded and NCPs will have to be secured unless EITHER seal injection OR thermal barrier cooling is restored.
- C. NCP operational limits will be exceeded and NCPs will have to be secured unless BOTH seal injection AND thermal barrier cooling are restored.
- D. NCP operational limits will be exceeded and NCPs will have to be secured unless thermal barrier cooling is restored within 30 minutes.

45 DAY VERSION

Which ONE (1) of the following describes the OPERATIONAL CONCERN associated with a Loss of Seal Injection Flow coincident with a Loss of Thermal Barrier Heat Exchanger KC Flow?

- A. An increase in pump lower bearing temperature, seal temperatures, and No.1 seal leakoff flow is expected. However, prompt closure (within five minutes) of a Seal Return Containment Isolation Valve should allow continued NCP operation.
- B. NCP operation in this condition is limited to 30 minutes, due to the affect of borated NCS fluid on the pump seals. Seal Injection flow must be recovered or a pump trip will be required.
- C. No temperature increase of the pump or motor bearings is expected but No.1 seal operation can not continue without fluid between the non-rubbing seal faces. Therefore, the No.2 seal must be placed in operation immediately or No.1 seal failure will occur.
- D. An increase in pump lower bearing temperature, seal temperatures, and No.1 seal leakoff flow is expected. Exceeding one of the pump operational limitations is expected unless seal injection or thermal barrier cooling is recovered.

401-9 Comments:

APE015/017AK2.08

All choices involve teaching. Additionally, the stem does not solicit much of the info included. Since the Q is comprehensive, redesign it to a two part Q.

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 41

B

General Discussion

The conditions presented in this question represent complete loss of seal cooling to the NCP seals and the NCP lower pump bearing. This would result in the water at NC system temperature reaching the pump seal package within approximately 10 minutes and would result in the pump parameter reaching trip criteria for both seal leakoff temperature and lower bearing temperature.

KA is matched because the candidate must demonstrate and understand interrelations between a loss of KC cooling to the thermal barrier coincident with a loss of seal injection. Additionally the conditions presented will result in a loss of the pump.

This is a higher cognitive level question because the candidate must interpret multiple symptoms of a failure, evaluate the impact to continued pump operation and evaluate alternate actions to mitigate the consequences of the loss of cooling.

Answer A Discussion

Incorrect. Plausible because seal injection or thermal barrier cooling must be restored to continue operation of NCPs. The time that is must be restored is significantly less than 30 minutes. Multiple references to 30 minutes in Limits and Precautions.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Since both seal injection and thermal barrier cooling provide cooling to the NCP bearings and seals, it is plausible to believe that both are required for continued operation.

Answer D Discussion

Incorrect. Plausible because seal injection or thermal barrier cooling must be restored to continue operation of NCPs. The time that is must be restored is significantly less than 30 minutes. Multiple references to 30 minutes in Limits and Precautions.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	Bank #PSNCP043

401-9 Comments RESPONSE

Per Chief Examiner's comment revised question to remove 'teaching' statements from the answers.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	Development References Technical Reference(s): Lesson Plan OP-MC-PS-NCP Rev. 25, page 25 Learning Objective: OP-MC-PS-NCP, Obj. 4	Student References Provided
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QuestionBank #	KA_system	KA_number	KA_desc
1841	APE015/017	AK2.08	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: (CFR 41.7 / 45.7) <input type="checkbox"/> CCWS

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QUESTION 41

B

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2009 RO NRC Retake Examination

QUESTION 42

C

QuestionBank #	KA_system	KA_number	KA_desc
1842	APE022	AK1.02	Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Relationship of charging flow to pressure differential between charging and RCS

CURRENT

Which ONE (1) of the following describes why NC system pressure is checked less than 2335 PSIG immediately after initiating emergency boration in FR-S.1 (Response to Nuclear Generation / ATWS)?

- A. To reduce NC pressure to allow closing of NV pump recirc valves to maximize emergency boration flow.
- B. To maintain positive control of NC pressure to prevent lifting a code safety relief valve.
- C. To ensure that the boration flow rate is sufficient for emergency boration.
- D. To maintain pressure below the PORV setpoint to prevent cycling the PORVs.

45 DAY VERSION

Which ONE (1) of the following describes why NC system pressure is checked less than 2335 PSIG immediately after initiating emergency boration in FR-S.1, Response to Nuclear Generation / ATWS?

- A. To reduce NC pressure to allow closing of NV pump recirc valves to maximize emergency boration flow.
- B. To maintain positive control of NC pressure to prevent lifting a code safety relief valve.
- C. To ensure that the boration flow rate is sufficient for emergency boration.
- D. To maintain pressure below the PORV setpoint to prevent cycling the PORVs.

401-9 Comments:

APE022AK102
 Revisited
 No comment at this time
 RFA 10/28/09

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2009 RO NRC Retake Examination QUESTION 42

C

No comment at this time
RFA 10/09/09

General Discussion

NC system pressure is checked after initiation of emergency boration in FR-S.1 to ensure that pressure is low enough to provide adequate boration flow to the NC system. If NC system pressure is elevated, it would impede charging flow (and hence boration flow) to the NC system.

The higher level portion of this KA related to Loss of Reactor Coolant Makeup could not be directly matched. The MNS Abnormal Procedure for associated with Loss of Reactor Coolant Makeup (AP-12, Loss of Letdown, Charging, or Seal Injection) does not address checking NC system pressure to determine if an elevated NC system pressure is impeding charging flow to the system. The closest possible match was to relate the question to a potential for insufficient boration flow as a result of the differential pressure between the NV and NC systems when emergency boration is required.

Answer A Discussion

Incorrect. Plausible as there is Foldout criteria which has the operator check NC system pressure to determine if the NV pump recirc valves should be open.

Answer B Discussion

Incorrect. Plausible as this is below the lift setpoint for the Pressurizer safety valves.

Answer C Discussion

CORRECT

Answer D Discussion

Incorrect. Plausible as this is below the lift setpoints for the PZR PORVs.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank EPFRSN07

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References	Student References Provided
OP-MC-EP-FRS page	

QuestionBank #	KA_system	KA_number	KA_desc
1842	APE022	AK1.02	Knowledge of the operational implications of the following concepts as they apply to Loss of Reactor Coolant Makeup: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Relationship of charging flow to pressure differential between charging and RCS

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QUESTION 42

C

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QUESTION 43

B

QuestionBank #	KA_system	KA_number	KA_desc
1843	APE026	AA2.04	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: (CFR: 43.5 / 45.13) <input type="checkbox"/> The normal values and upper limits for the temperatures of the components cooled by CCW

CURRENT

45 DAY VERSION

Given the following current conditions on Unit 1:

- Unit is operating at 100% RTP
- A malfunction of the Letdown Hx Outlet temperature controller has caused 1KC-132 (Letdown Hx Cooling Water Control) valve to slowly drift closed
- Letdown Heat Exchanger Outlet temperature has increased from 106°F to 115°F

Which ONE (1) of the following correctly completes the statement below?

Based on current conditions, NC system temperature will (1) due to reactivity effects **AND** if Letdown Hx Outlet temperature continues to increase, 1NV-127A, LD Hx Outlet 3-Way Cntrl will divert to the VCT at (2).

- A. (1) decrease
(2) 120°F
- B. (1) decrease
(2) 138°F
- C. (1) increase
(2) 120°F
- D. (1) increase
(2) 138°F

Given the following current conditions on Unit 1:

- Unit is operating at 100% RTP
- A malfunction of the Letdown Hx Outlet temperature controller has caused 1KC-132 (Letdown Hx Cooling Water Control) valve to slowly drift closed
- Letdown Heat Exchanger Outlet temperature has increased from 106°F to 115°F

Based on current conditions, NC system temperature will (1) **AND** if Letdown Hx Outlet temperature continues to increase, 1NV-127A, LD Hx Outlet 3-Way Cntrl will divert to the VCT at (2).

Which ONE (1) of the following correctly completes the statement above?

- A. (1) decrease
(2) 120°F
- B. (1) decrease
(2) 138°F
- C. (1) increase
(2) 120°F
- D. (1) increase
(2) 138°F

401-9 Comments:

APE026AA2.04

I think 120oF is NOT plausible because it is too low. Consider using a higher temperature. At what temp does the resin burn? Something higher than 138 would also be acceptable.

RFA 10/28/09

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QUESTION 43

B

General Discussion

The increase in Letdown Heat Exchanger Outlet temperature causes an increase in mixed bed demineralizer resin temperature. This temperature increase results in thermal regeneration of the resin and the release of boron from the demineralizer resin to the letdown. This results in an increase in the boron concentration of the charging water going back to the NC system which causes NC system temperature to decrease. If Letdown temperature increases to 138°F, letdown will divert to the VCT to protect the demineralizer resin from damage.

This KA is matched because the applicant must determine the effect that increase in letdown line temperature will have on NC system temperature and the upper limit for letdown temperature before NV-127A diverts.

This is a comprehension level question because the applicant must process and evaluate multiple pieces of information to determine the correct answer. First, the applicant must determine the increase in letdown temperature will result in a release of boron from the demineralizers and then determine that the increase in boron concentration in the NV charging will result in a temperature decrease. The applicant must then recall from memory the temperature setpoint for the diversion of letdown flow.

Answer A Discussion

Incorrect. NC system temperature decreasing is correct. The temperature of 120°F is plausible because that is the setpoint for the Letdown Hx Outlet Hi Temperature Annunciator.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible if the applicant does not recall the effect of letdown line temperature on the affinity of demineralizer resin for boron. 120°F is plausible because it is the setpoint for the Letdown Hx Outlet Temperature Hi Annunciator.

Answer D Discussion

Incorrect. Plausible if the applicant does not recall the effect of letdown line temperature on the affinity of demineralizer resin for boron. The temperature setpoint is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Disagree with Lead on this one, facility feels that 120 deg has ample plausibility, plan to discuss further when during on site review.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Annunciator Response Procedure for Panel 1AD-7 / H2
BNT-CH05R3, Ion Exchange Objective 23 page 23

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1843	APE026	AA2.04	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: (CFR: 43.5 / 45.13)()The normal values and upper limits for the temperatures of the components cooled by CCW

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2009 RO NRC Retake Examination QUESTION 43

B

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2009 RO NRC Retake Examination QUESTION 44

A

QuestionBank #	KA_system	KA_number	KA_desc
1844	APE027	AK3.04	Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: (CFR 41.5, 41.10 / 45.6 / 45.13) <input type="checkbox"/> Why, if PZR level is lost and then restored, that pressure recovers much more slowly

CURRENT

Given the following events and conditions on Unit 1:

- A Reactor Trip and SI have occurred due to a faulted S/G
- The affected S/G has now been isolated per E-2 (Faulted S/G Isolation)
- The transient resulted in PZR level indicating off scale low for a period of time but is now 70% and stable
- Safety injection has been terminated and normal letdown and charging have been restored.
- The Pressurizer Pressure Master has been placed in MANUAL with a 50% output and all backup heaters have just been energized.
- NC system pressure is 2000 PSIG and increasing.

Which ONE (1) of the following describes the resulting behavior of PZR pressure AND the automatic action that will occur to protect the NC system if an overpressure condition develops?

- A. PZR pressure will recover slowly because the water in the PZR is subcooled: Pressurizer PORVs 1NC-32 & 36 will open at 2335 PSIG.
- B. PZR pressure will recover slowly because the water in the PZR is subcooled: Pressurizer PORV 1NC-34 will open at 2335 PSIG.
- C. PZR pressure will recover rapidly because of the elevated level and smaller steam space volume: Pressurizer PORVs 1NC-32 & 36 will open at 2335 PSIG.
- D. PZR pressure will recover rapidly because of the elevated level and smaller steam space volume: Pressurizer PORV 1NC-34 will open at 2335 PSIG.

45 DAY VERSION

Given the following events and conditions on Unit 1:

- A Reactor Trip and SI has occurred due to a stuck open PZR Safety valve
- The affected Safety valve has now reseated and is no longer leaking
- The transient resulted in PZR level indicating off scale low for a period of time but is now 70% and stable
- Safety injection has been terminated and normal letdown and charging have been restored.
- The Pressurizer Pressure Master has been placed in MANUAL with a 50% output and all backup heaters have just been energized.
- NC system pressure is 2000 PSIG and increasing.

Which ONE (1) of the following describes the resulting behavior of PZR pressure AND the automatic action that will occur to protect the NC system if an overpressure condition develops?

- A. PZR pressure will recover slowly because the water in the PZR is subcooled: Pressurizer PORVs 1NC-32 & 36 will open at 2335 PSIG.
- B. PZR pressure will recover slowly because the water in the PZR is subcooled: Pressurizer PORV 1NC-34 will open at 2335 PSIG.
- C. PZR pressure will recover rapidly because of the elevated level and smaller steam space volume: Pressurizer PORVs 1NC-32 & 36 will open at 2335 PSIG.
- D. PZR pressure will recover rapidly because of the elevated level and smaller steam space volume: Pressurizer PORV 1NC-34 will open at 2335 PSIG.

401-9 Comments:

APE027AK3.04
 Stem: 1st bullet: Change "has" to "have".
 Psychometrics: As written, B is also a correct answer.
 Additionally, If C was correct, so would D.
 This Q is U because of multiple correct answers.

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QUESTION 44

A

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General Discussion

The first part of the question applies anytime the PZR is emptied and subsequently refills. This results in subcooled liquid in the majority of the PZR liquid space which has to be heated to saturated temperature before normal pressure response is recovered. There is no specific objective that covers this phenomena but in all the EP steps which the plant is recovering from a loss of inventory such as step 17 of ES 1.1 (SI Termination), the basis references restoring the PZR to saturated conditions. In the scenario given in the question, pressure response from backup heater operation would be extremely slow. Second part of the question concerns the effect of placing the pressure master in manual at a 50% output. As long as it remains in manual, the output would be unaffected by actual NC system pressure therefore the components controlled by this instrument would be unaffected as well. One of the PZR PORVs, 1NC-34A is controlled strictly by the output of the pressure master (Opens at 81.2%), the other two (NC 32 & 36) are controlled by the second selected pressure channel and would function independent of the pressure master output.

K/A is matched because the candidate must understand how a scenario involving a loss and subsequent recovery of PZR level would affect pressure control. Additionally he must evaluate the effect of an off normal alignment of the pressure control system.

Analysis level because the candidate must evaluate a given scenario and predict an outcome based on selected switch positions and evaluation of a transient associated with PZR level.

Answer A Discussion

Correct: See explanation above

Answer B Discussion

Plausible: First answer is correct, Second answer is plausible because if the PZR pressure master is selected to auto, 1NC-34 would open before the other two due to the build in of the integral function of the controller.

Answer C Discussion

Plausible: if the candidate believes that the elevated PZR level would have a significant impact to pressure control, this condition would have a very limited effect but in the scenario given it would be insignificant. 2nd part is correct.

Answer D Discussion

Plausible: First part is plausible as explained above, second. Second answer is plausible because if the PZR pressure master is selected to auto, 1NC-34 would open before the other two due to the build in of the integral function of the controller

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's comment change 'has' to 'have' in stem of question. Answers B and D cannot be correct because with the Pressurizer Pressure Master in MANUAL at 50%, 1NC-34 will never open regardless of NC system pressure. HCF 11/03/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Technical Reference(s): OP-MC-PS-IPE Rev 28 Page 21
Learning Objective: OP-MC-PS-IPE, Obj 4 & 9

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1844	APE027	AK3.04	Knowledge of the reasons for the following responses as they apply to the Pressurizer Pressure Control Malfunctions: (CFR

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QUESTION 44

A

41.5,41.10 / 45.6 / 45.13) Why, if PZR level is lost and then restored, that pressure recovers much more slowly

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QUESTION 45

C

QuestionBank #	KA_system	KA_number	KA_desc
1845	EPE029	2.4.2	EPE029 GENERIC Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

CURRENT

Which ONE (1) of the following lists the indications which are checked in E-0, (Reactor Trip or Safety Injection) prior to implementing monitoring of Critical Safety Function Status Trees to determine if entry into FR-S.1, Response to Nuclear Generation / ATWS is required?

1. I/R Amps – GOING DOWN
2. All Rod Bottom Lights – LIT
3. Reactor Trip and Bypass Breakers – OPEN
4. I/R SUR – ZERO OR NEGATIVE
5. All Power Channels – LESS THAN 5%

- A. 2, 3, and 5 ONLY
- B. 3, 4, and 5 ONLY
- C. 1, 2, and 3 ONLY
- D. 2, 3, and 4 ONLY

45 DAY VERSION

Which ONE (1) of the following lists the indications which are checked in E-0, (Reactor Trip or Safety Injection) prior to implementing monitoring of Critical Safety Function Status Trees to determine if entry into FR-S.1, Response to Nuclear Generation / ATWS is required?

1. I/R Amps – GOING DOWN
2. All Rod Bottom Lights – LIT
3. Reactor Trip and Bypass Breakers – OPEN
4. I/R SUR – ZERO OR NEGATIVE
5. All Power Channels – LESS THAN 5%

- A. 2, 3, and 5 ONLY
- B. 3, 4, and 5 ONLY
- C. 1, 2, and 3 ONLY
- D. 2, 3, and 4 ONLY

401-9 Comments:

EPE029G2.4.2
No comment at this time
RFA 10/28/09

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QUESTION 45

C

General Discussion

Immediate actions from E-0.

When checking the Reactor Tripped:

- 1) All Rod Bottom lights - LIT
- 2) Reactor Trip and Bypass Breakers - Open
- 3) IR AMPs - Going Down

This KA is matched because the question requires the applicant to know what indications (i.e. entry conditions for E-O) are checked as part of the immediate actions for E-0.

Answer A Discussion

Incorrect. Plausible because 2 & 3 are correct and Power Range Channels less than 5% is an entry condition for FR-S.1.

Answer B Discussion

Incorrect. Plausible because 3 is correct, 4 is associated with IR indication which is checked (except zero or negative is an entry condition for FR-S.1), and Power Range Channels less than 5% is an entry condition for FR-S.1.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible since 2 and 3 are correct and 4 is associated with IR indication which is checked (except zero or negative is an entry condition for FR-S.1).

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

<input checked="" type="checkbox"/> Developed <input checked="" type="checkbox"/> OPT Approved <input checked="" type="checkbox"/> OPS Approved <input checked="" type="checkbox"/> NRC Approved	<p>Development References</p> <p>E-0, Reactor Trip or Safety Injection page 3</p>	<p>Student References Provided</p>
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QuestionBank #	KA_system	KA_number	KA_desc
1845	EPE029	2.4.2	EPE029 GENERIC <input type="checkbox"/> Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. (CFR: 41.7 / 45.7 / 45.8)

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QUESTION 46

D

QuestionBank #	KA_system	KA_number	KA_desc
1846	EPE038	EA1.10	Ability to operate and monitor the following as they apply to a SGTR: (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> Control room radiation monitoring indicators and alarms

CURRENT

Unit 1 is operating at 100% RTP. Given the following conditions:

- 1EMF-33 (Condenser Air Ejector Exhaust) alarms in Trip 2

Given the conditions above, which ONE (1) of the following should be used to confirm that a primary-to-secondary leak exists per NSD-513 (Primary-to-Secondary Leak Monitoring Program)?

- A. S/G feed flow to steam flow mismatch
- B. 1EMF-24, 25, 26 and 27 (STEAMLINE HI RAD- Doghouse)
- C. 1EMF-34 (S/G SAMPLE)
- D. 1EMF-71, 72, 73, and 74 (STEAMLINE N-16 LEAKAGE)

45 DAY VERSION

Unit 1 is operating at 100% RTP. Given the following conditions:

- 1EMF-33 (Condenser Air Ejector Exhaust) alarms in Trip 2

Which ONE (1) of the following provides the best indication per NSD-513 (Primary-to-Secondary Leak Monitoring Program) that a S/G tube leak has occurred?

- A. S/G feed flow to steam flow mismatch
- B. 1EMF-24, 25, 26 and 27 (STEAMLINE HI RAD- Doghouse)
- C. 1EMF-34 (S/G SAMPLE)
- D. 1EMF-71, 72, 73, and 74 (STEAMLINE N-16 LEAKAGE)

401-9 Comments:

EPE038EA1.10

This Q is confusing. NSD-513 states that the best method is EMF-33 and the secondary method is the N-16 monitor. The Q stem asks what the best indication is to determine that a SG tube leak has occurred. The stem seems to contradict the ref material slightly by the way it is worded. Facility please re-evaluate.

RFA 10/28/09

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QUESTION 46

D

General Discussion

In accordance with NSD-513, the primary method for detecting primary-to-secondary leakage while on line is the condenser off-gas (EMF-33) radiation monitor. The secondary method for detecting tube leakage on line is the N-16 (EMF-71, 72, 73, & 74) radiation monitors.

This KA is matched because the applicant must know which methods (radiation monitors) are valid or accurate indications of S/G tube leakage under various plant conditions. The "operate" part of this KA is not applicable to MNS as there is nothing to operate related to the radiation monitors associated with detection of SG tube leakage.

Answer A Discussion

Incorrect. Not sensitive enough to detect leakage of this magnitude. Plausible because it can be used to detect a SGTR.

Answer B Discussion

Incorrect. Can be used. However, it is not the best indication for detecting tube leakage as they are not as sensitive as the N-16 monitors. Plausible because they would be the most accurate verification of tube leakage if the unit was shut down.

Answer C Discussion

Incorrect. SG sample line isolates on an EMF-33 trip 2. Plausible because it would be a good answer if the automatic actions did not occur.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank WEEMFN04

401-9 Comments RESPONSE

Per Chief Examiner's comment, revised question to remove confusion from the stem. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
NSD-513, Primary-to-Secondary Leakage Monitoring Program

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1846	EPE038	EA1.10	Ability to operate and monitor the following as they apply to a SGTR: (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> Control room radiation monitoring indicators and alarms

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QUESTION 47

C

QuestionBank #	KA_system	KA_number	KA_desc
1847	APE040	AK1.01	Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Consequences of PTS

CURRENT

Unit 1 is responding to a Steam Break inside Containment from 100% RTP.

Given the following events and conditions:

- Narrow Range S/G level is 15% for each intact S/G
- The NCPs were TRIPPED
- FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition) has been implemented
- NCS temperature is now STABLE
- NCS pressure is STABLE
- Letdown has been RESTORED

The crew has determined that a 1 hour soak is required. Which ONE (1) of the following evolutions could be performed by the crew in the next hour while continuing on through the EP procedures?

- A. Start 1D NCP
- B. Energize Pressurizer Heaters
- C. Place Auxiliary Spray in service
- D. Increase CA flow to one intact S/G to raise NR level to 50%

45 DAY VERSION

Unit 1 is responding to a Steam Break inside Containment from 100% RTP.

Given the following events and conditions:

- Narrow Range S/G level is 15% for each intact S/G
- The NCPs were tripped
- FR-P.1 (*Response to Imminent Pressurized Thermal Shock Condition*) has been implemented
- NCS temperature is now stable
- NCS pressure is stable
- Letdown has been restored

The crew has determined that a 1 hour soak is required. Which ONE (1) of the following evolutions could be performed by the crew in the next hour while continuing on through the EP procedures?

- A. Start 1D NCP
- B. Place Auxiliary Spray in service
- C. Increase CA flow to one intact S/G to raise NR level to 50%
- D. Commence a 25-degree/hour cooldown to Mode 5

401-9 Comments:

APE040AK1.01

Distracter D is NP. Replace D with a statement that would cause a CD without stating so. For example opening a valve or series in the primary or secondary that would cause a CD would be acceptable.

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QUESTION 47

C

General Discussion

During the NC system soak, evolutions may be performed from other procedures which do not increase NC system pressure or decrease NC system temperature

K/A is matched because the candidate is presented with a steam line rupture scenario and must understand what components can be manipulated during the soak (operational Implications) which will not violate the requirement to not increase pressure or decrease temperature. These limitations are part of the consequences of the PTS conditions which exist as a result of the rupture.

Analysis level because the candidate must analyze each answer and determine the effect of manipulating that component on NC system temperature and pressure.

Answer A Discussion

Plausible because earlier in FR-P.1, if SI termination criteria is not met, an NC pump is started to mix incoming SI water with NC system water to raise the temperature of the water entering the reactor vessel downcomer

Answer B Discussion

Incorrect. Plausible because FR-P.1 directs controlling pressure using heaters and spray in a step prior to initiating a soak. With NCS pressure stable, energizing heaters alone would increase pressure violating the direction to not increase pressure.

Answer C Discussion

CORRECT: See explanation above

Answer D Discussion

Incorrect. Plausible if the candidate believes that raising S/G level to a normal level is appropriate and does not consider the consequences of adding cold water to the S/Gs.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	Bank #EPFRPN01

401-9 Comments RESPONSE

Changed Distractor 'D' to "Energize Pressurizer Heaters". Then, rearranged answers for psychometric balance (D to B, B to C, C to D) making 'C' the correct answer. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Technical Reference(s): FR-P.1, Response to Imminent Pressurized Thermal Shock Condition, rev. 10, page 28
Learning Objective: OP-MC-EP-FRP, Objective 6

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1847	APE040	AK1.01	Knowledge of the operational implications of the following concepts as they apply to Steam Line Rupture: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Consequences of PTS

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QUESTION 48

D

QuestionBank #	KA_system	KA_number	KA_desc
1848	APE054	AA2.08	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): (CFR: 43.5 / 45.13) <input type="checkbox"/> Steam flow-feed trend recorder

CURRENT

Given the following conditions on Unit 1:

- The unit is operating at 100% RTP
- The steam pressure input for S/G 'B' controlling channel fails LOW

The S/G 'B' trend recorder will indicate which ONE (1) of the following?

- A. - Steam Flow increased
- Feed Flow decreased
- S/G Narrow Range level decreasing
- B. - Steam Flow increased
- Feed Flow increased
- S/G Narrow Range level increasing
- C. - Steam Flow decreased
- Feed Flow increased
- S/G Narrow Range level increasing
- D. - Steam Flow decreased
- Feed Flow decreased
- S/G Narrow Range level decreasing

45 DAY VERSION

Given the following conditions on Unit 1:

- The unit is operating at 100% RTP
- The steam pressure input for S/G 'B' controlling channel fails LOW

The S/G 'B' trend recorder will indicate which ONE (1) of the following?

- A. - Steam Flow increased
- Feed Flow decreased
- S/G Narrow Range level decreasing
- B. - Steam Flow increased
- Feed Flow increased
- S/G Narrow Range level increasing
- C. - Steam Flow decreased
- Feed Flow increased
- S/G Narrow Range level increasing
- D. - Steam Flow decreased
- Feed Flow decreased
- S/G Narrow Range level decreasing

401-9 Comments:

Ape054AA2.08
No comment at this time
RFA 10/28/09

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QUESTION 48

D

General Discussion

The steam pressure channel failing low causes a loss of density compensation to the controlling S/G B steam flow channel which causes the steam flow channel to decrease. In response the S/G water level control system will see a steam-flow feed flow mismatch and will close the Feed Control valve in an attempt to match feed flow to steam flow. The decrease in feedwater flow will cause S/G narrow range level to decrease.

The K/A is match because the applicant must diagnose a instrument failure which results in a loss of feedwater flow and determine what the indications on the steam flow - feed flow trend recorder would be.

This is an analysis level question because the applicant must analyze the effect of the failed instrument on the steam flow input to the S/G water level control program and how the change in the input affects the response of the system and the associated recorder trends which indicate that response.

Answer A Discussion

Incorrect. Plausible if the applicant does not understand the effect of the loss of density compensation on the indicated steam flow. The feed flow and S/G level response are correct.

Answer B Discussion

Incorrect. Plausible if the applicant does not understand the effect of the loss of density compensation on steam flow. And if steam flow increases it follows that feed flow would increase to match steam flow and level would increase.

Answer C Discussion

Incorrect. Steam flow decreasing is correct. Feed flow increasing is plausible if the applicant does not understand the effect of the steam flow decrease on Feed Control valve response. If the Feed flow increases the S/G level will increase.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS CFIFEN01

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Technical Reference(s): OP-MC-CF-IFE, rev. 21, page 33,

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1848	APE054	AA2.08	Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): (CFR: 43.5 / 45.13) <input type="checkbox"/> Steam flow-feed trend recorder

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QUESTION 48

D

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QUESTION 49

D

QuestionBank #	KA_system	KA_number	KA_desc
1849	EPE055	EK3.02	Knowledge of the reasons for the following responses as they apply to the Station Blackout : (CFR 41.5 / 41.10 / 45.6 / 45.13) <input type="checkbox"/> Actions contained in EOP for loss of offsite and onsite power

CURRENT

Given the following conditions:

- A loss of All AC power has occurred on Unit 1
- Crew has implemented ECA-0.0 (Loss of All AC Power)
- The Unit 1 Standby Make Up pump has failed
- Incore Cooling Monitor indicates subcooling is - 5°F

Which ONE (1) of the following describes the reason for depressurizing the S/G's to 290 PSIG?

- A. Initiate Cold Leg Accumulator injection to restore subcooling.
- B. Initiate Cold Leg Accumulator injection to maintain the core subcritical.
- C. Reduce NC system temperature and pressure to establish Natural Circulation conditions.
- D. Reduce NC system temperature and pressure to reduce NC pump seal leakage and minimize NC system inventory loss.

45 DAY VERSION

Given the following conditions:

- A loss of All AC power has occurred on Unit 1
- Crew has implemented ECA-0.0 (Loss of All AC Power)
- Attempts to place the Unit 1 Standby Make Up pump in service have failed
- The crew is performing actions to depressurize the S/G's to 290 PSIG

Which ONE (1) of the following describes the reason for this action?

- A. Initiate Cold Leg Accumulator injection to re-establish NC system subcooling.
- B. Initiate Cold Leg Accumulator injection and establish Natural Circulation conditions.
- C. Reduce NC system temperature and pressure to establish Natural Circulation conditions.
- D. Reduce NC system temperature and pressure to reduce NC pump seal leakage and minimize NC system inventory loss.

401-9 Comments:

EPE055EK3.02

A is NP because there is nothing in the stem to indicate that NC system subcooling has been lost or challenged.

There is nothing in the reference to support the use or potential use of CLAs in this case..

Distracters A and B do not appear to be plausible.

This Q is U until it is proved otherwise.

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QUESTION 49

D

RFA 10/28/09

General Discussion

The S/Gs are depressurized to 290 psig to reduce NC system temperature and pressure. This will reduce the amount of leakage from the NC pump seals which will minimize the NC system inventory loss until AC power can be restored.

If SGs are depressurized to less than 190 psig, the CLA accumulators will inject into the NC System. While this is desirable in some EOP mitigating schemes to depressurize the SGs to cause the CLAs to inject (i.e. ECA-1.1, Loss of Emergency Coolant Recirculation), in ECA-0.0 it is undesirable to have the CLAs inject as any nitrogen which enters the NC system could disrupt Natural Circulation flow.

K/A is matched since the applicant must know the basis for actions taken in the EPs during a Station Blackout.

Answer A Discussion

Incorrect. Plausible because the step to depressurize the S/G's is not performed unless subcooling is lost. Additionally, injecting the CLAs would provide relatively cool water to the NC system which would act to improve subcooling.

Answer B Discussion

Incorrect. Plausible because there is extensive discussion in the WOG background document regarding the potential to return to a critical condition during SG depressurization prior to reaching the CLA injection pressure (i.e. EOL with low temperature).

Answer C Discussion

Incorrect. While reducing NC pump seal leakage is correct and establishing Natural Circulation conditions is desirable, reducing SG pressures to 290 psig is not required to establish Natural Circulation conditions.

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	CNS NRC Exam Bank Question 126

401-9 Comments RESPONSE

Per Chief Examiner's comments, revised distractors 'A' and 'B' to add plausibility.
HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References	Student References Provided
ECA-0.0 page 22 Lesson Plan OP-MC-EP-ECA-0 pages 19 and 49	

QuestionBank #	KA_system	KA_number	KA_desc
1849	EPE055	EK3.02	Knowledge of the reasons for the following responses as they apply to the Station Blackout : (CFR 41.5 / 41.10 / 45.6 / 45.13) <input type="checkbox"/> Actions contained in EOP for loss of offsite and onsite power

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QUESTION 49

D

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2009 RO NRC Retake Examination

QUESTION 50

A

QuestionBank #	KA_system	KA_number	KA_desc
1850	APE056	AA2.37	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: (CFR: 43.5 / 45.13) □ ED/G indicators for the following: voltage, frequency, load, load-status, and closure of bus tie breakers

CURRENT

A Loss of Off-Site Power (LOOP) has occurred.

D/G '1B' is supplying bus 1ETB, loaded as follows:

- Voltage - 4120 volts.
- Frequency - 59.4 Hz.
- Load - 1800 KW.

Which one of the following describes the response of D/G '1B' when the Governor Control RAISE pushbutton is depressed?

- A. Frequency increases; load and voltage remain the same.
- B. Frequency and voltage remain the same; load increases.
- C. Frequency increases; load remains the same; voltage increases.
- D. Frequency remains the same; load and voltage increase.

45 DAY VERSION

A Loss of Off-Site Power (LOOP) has occurred.

D/G '1B' is supplying bus 1ETB, loaded as follows:

- Voltage - 4120 volts.
- Frequency - 59.4 Hz.
- Load - 1800 KW.

Which one of the following describes the response of D/G '1B' when the Governor Control RAISE pushbutton is depressed?

- A. Frequency increases; load and voltage remain the same.
- B. Frequency and voltage remain the same; load increases.
- C. Frequency increases; load remains the same; voltage increases.
- D. Frequency remains the same; load and voltage increase.

401-9 Comments:

APE056AA2.37
No comment at this time
RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 50

A

General Discussion

Generator running disconnected from grid - No VAR loading or load sharing. Generator in isochronous mode means governor is speed = frequency. Voltage is excitation=volts. When frequency is raised, other parameters may change slightly depending on the value of those parameters.

K/A is matched as the applicant must understand how EDG indications are affected when the diesel generator is operated in isochronous mode (i.e. during a Loss of Offsite Power).

This is an analysis type question as the applicant must relate several pieces of information both given and recalled from memory. The given information is the initial condition where the EDG is operating supplying the bus in isochronous mode. The applicant must then recall from memory the effect of depressing the Generator Control RAISE pushbutton with the generator operating in isochronous mode.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Partially correct if DG was paralleled

Answer C Discussion

Incorrect. In isochronous, raising frequency would not increase voltage

Answer D Discussion

Incorrect. Voltage remains the same.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2006 CNS NRC Q50 (Bank 127)

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Lesson Plan OP-MC-DG-DG Objectives 14 and 15
page 31

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1850	APE056	AA2.37	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: (CFR: 43.5 / 45.13) <input type="checkbox"/> ED/G indicators for the following: voltage, frequency, load, load-status, and closure of bus tie breakers

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QUESTION 51

C

QuestionBank #	KA_system	KA_number	KA_desc
1851	APE057	AA1.06	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> Manual control of components for which automatic control is lost

CURRENT

Reactor power is at 45% RTP with all systems in automatic when you notice the following:

- 120 VAC ESS PWR CHANNEL A TROUBLE alarm
- CH 1 Impulse pressure indicates 0 PSIG
- All 4 S/G CH 1 Feed Flow, Stm Flow and Levels indicate 0 %
- CH 1 PZR pressure indicates 1700 PSIG

Which ONE (1) of the following lists the IMMEDIATE ACTIONS which must be taken based on these indications?

- A. Manually trip the reactor.
- B. Place Control Rods and Feedwater Reg valves in Manual and restore Tave to Tref.
- C. Place Control Rods and Feedwater Reg valves in Manual, and manually restore S/Gs to programmed level.
- D. Place Pressurizer Pressure Master in Manual, adjust to 50%, and then place "PZR PRESS CNTRL SELECT" switch to backup channel.

45 DAY VERSION

Reactor power is at 45% RTP with all systems in automatic when you notice the following:

- 120 VAC ESS PWR CHANNEL A TROUBLE alarm
- CH 1 Impulse pressure indicates 0 PSIG
- All 4 S/G CH 1 Feed Flow, Stm Flow and Levels indicate 0 %
- CH 1 PZR pressure indicates 1700 PSIG

Which ONE (1) of the following lists the IMMEDIATE ACTIONS which must be taken based on these indications?

- A. Manually trip the reactor and go to E-0 (Reactor Trip or Safety Injection).
- B. Place Control Rods and Feedwater Reg valves in Manual and restore Tave to Tref.
- C. Place Control Rods and Feedwater Reg valves in Manual, and manually restore S/Gs to programmed level.
- D. Place Pressurizer Pressure Master in Manual, adjust to 50%, and then place "PZR PRESS CNTRL SELECT" switch to backup channel.

401-9 Comments:

APE057AA1.06

To be consistent, state in B, C, and D the procedure you will go to after completing the IAs.

RFA 10/28/09

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QUESTION 51

C

General Discussion

The Immediate Actions of AP-15, Loss of Vital or Aux Control Power require the operator to check the status of instrument channels 1 and 2. If those channels are lost the operator must place the control rods in manual and place the CF control valves in manual and restore S/G levels to program level.

The K/A is matched because the applicant is required to the manual actions which must be taken to control the plant on a loss of a vital instrument bus.

Answer A Discussion

Incorrect. Plausible if the applicant believes that MSIVs have closed or control of the plant has been lost and that tripping the reactor is necessary to place the plant in a safe condition.

Answer B Discussion

Incorrect. Plausible because these are actions that will be taken to restore plant conditions to normal. However, these are done later in AP-15 and are NOT immediate actions.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible as there are actions later in AP-15 regarding the Pressurizer Pressure channel failure. However, they are not immediate actions.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank Question AP15002

401-9 Comments RESPONSE

Per Chief Examiner's comment, removed reference to procedure (E-0) in distractor 'A'. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP-15, Loss of Vital or Aux Control Power page 3, 6, 8, and 22

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1851	APE057	AA1.06	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> Manual control of components for which automatic control is lost

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QUESTION 52

B

QuestionBank #	KA_system	KA_number	KA_desc
1852	APE058	AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: (CFR 41.5,41.10 / 45.6 / 45.1) <input type="checkbox"/> Actions contained in EOP for loss of dc power

CURRENT

Given the following:

- A loss of ALL AC power has occurred on Unit 1
- Crew has implemented ECA 0.0 (Loss of All AC Power)
- The crew is performing Enc 7 (DC Bus Alignment) of AP-07 (Loss of Electrical Power)

Which ONE (1) of the following completes the statements below?

Power must be restored to the battery chargers within (1) .

The **MAXIMUM DESIGN** loads that the 125v DC Vital Batteries are designed to carry under emergency conditions with **NO** Essential AC available to the Vital Chargers is (2) .

- A. (1) ONE hour
 (2) One (1) 125v DC Distribution Center, Two(2) 125v DC Panel Boards, Two (2) 120v AC Static Inverters
- B. (1) ONE hour
 (2) Two(2) 125v DC Distribution Centers, Four (4) 125v DC Panel Boards, Four (4) 120v AC Static Inverters
- C. (1) 30 minutes
 (2) Two(2) 125v DC Distribution Centers, Four(4) 125v DC Panel Boards, Four(4) 120v AC Static Inverters
- D. (1) 30 minutes
 (2) One (1) 125v DC Distribution Center, Two(2) 125v DC Panel Boards, Two (2) 120v AC Static Inverters

45 DAY VERSION

Given the following:

- A loss of ALL AC power has occurred on Unit 1
- Crew has implemented ECA 0.0 (Loss of All AC Power)
- The crew is performing Enc 7 (DC Bus Alignment) of AP-07 (Loss of Electrical Power)

Power must be restored to the battery chargers within (1) .

The **MAXIMUM DESIGN** loads that the 125v DC Vital Batteries are designed to carry under emergency conditions with no Essential AC available to the Vital Chargers is (2) .

- A. (1) ONE hour
 (2) One (1) 125v DC Distribution Center, Two(2) 125v DC Panel Boards, Two (2) 120v AC Static Inverters
- B. (1) ONE hour
 (2) Two(2) 125v DC Distribution Centers, Four (4) 125v DC Panel Boards, Four (4) 120v AC Static Inverters
- C. (1) 30 minutes
 (2) Two(2) 125v DC Distribution Centers, Four(4) 125v DC Panel Boards, Four(4) 120v AC Static Inverters
- D. (1) 30 minutes
 (2) One (1) 125v DC Distribution Center, Two(2) 125v DC Panel Boards, Two (2) 120v AC Static Inverters

401-9 Comments:

APE058AK3.02
 No comment at this time
 RFA 10/28/09

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QUESTION 52

B

General Discussion

Step 24 of ECA 0.0 directs the crew to align DC buses per AP-07. Enc 7 (DC bus Alignment). This step is preceded with a caution stating that it is time critical action. In a loss of all AC scenario, the station batteries are the only source of electrical power. The vital batteries are sized to supply (two DC buses which includes the two inverters and their panelboards), plus supply the loads of its sister distribution center (two DC buses which includes the two inverters and their panelboards), if required, for a period of one hour.

KA is matched because the candidate must understand why the action directed in ECA 0.0 (Loss of all AC) Step 24 is time critical and what components are potentially affected should this actions not be taken. This action is taken in order to preserve the DC power sources, our EOPs contain no actions that deal directly with a loss of DC power. Loss of DC power sources are addressed with AOP's so the best match for this K/A is to test the actions to prevent a loss of DC power sources and reasons for those actions.

Answer A Discussion

Plausible: Answer 1 is correct,
Answer 2 is plausible because the loads listed are the normal loads for a vital battery.

Answer B Discussion

CORRECT

Answer C Discussion

Plausible: 30 minutes duty cycle would be correct for some of our other batteries such as those supplying the D/Gs. Answer 2 is plausible as explained above.

Answer D Discussion

Plausible: Answer 1 is plausible as explained above and answer 2 is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Per Chief Examiner's general comments, added WOOTF question. HCF 11/04/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Technical Reference(s): Lesson Plan OP-MC-EL-EPL, Rev. 23 Pg 25
Learning Objective: OP-MC-EL-EPL, Obj 12

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1852	APE058	AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of DC Power: (CFR 41.5,41.10 / 45.6 / 45.1) <input type="checkbox"/> Actions contained in EOP for loss of dc power

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QUESTION 53

B

QuestionBank #	KA_system	KA_number	KA_desc
1853	APE062	AA1.05	Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water (SWS): (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> The CCWS surge tank, including level control and level alarms, and radiation alarm

CURRENT

Given the following:

- Due to air entrainment, both Unit 1 RN pumps were tripped
- The Unit 1 Reactor was tripped along with all NC pumps
- As a result of this transient, a leak developed associated with the 1A NC pump thermal barrier
- 1EMF-46A (Unit 1 Component Cooling A) is in Trip 2
- KC Surge tank levels are increasing

Which ONE (1) of the following best completes the statements below?

1KC-364B (A NC PUMP THERM BAR OTLT) will Auto Close at (1).

1KC-122 (U-1 KC Surge Tank Vent Valve) (2).

- A. (1) 60 GPM
(2) must be re-opened from the Local Control Station
- B. (1) 60 GPM
(2) will re-open when the EMF signal clears
- C. (1) 70 GPM
(2) must be re-opened from the Local Control Station
- D. (1) 70 GPM
(2) will re-open when the EMF signal clears

45 DAY VERSION

Given the following:

- Due to air entrainment, both Unit 1 RN pumps were tripped
- The Unit 1 Reactor was tripped along with all NC pumps
- As a result of this transient, a leak developed associated with the 1A NC pump thermal barrier
- 1EMF-46A (Unit 1 Component Cooling A) is in Trip 2
- KC Surge tank levels are increasing

1KC-364B (A NC PUMP THERM BAR OTLT) will Auto Close at (1).

1KC-122 (U-1 KC Surge Tank Vent Valve) (2).

Which ONE (1) of the following best completes the statements above?

- A. (1) 60 GPM
(2) must be re-opened at the Local Control Station
- B. (1) 60 GPM
(2) will re-open when the EMF signal clears
- C. (1) 70 GPM
(2) must be re-opened at the Local Control Station
- D. (1) 70 GPM
(2) will re-open when the EMF signal clears

401-9 Comments:

APE062AA1.05

Reverse the WOOTF statement and put it up front.

The discussion (distracter analysis) does not line up with the Q. Please re-evaluate. However, the reference does support the correct answer.

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 53

B

General Discussion

NCP Thermal Barrier isolation valves (KC-345, 364, 394, & 413) will automatically close to isolate the thermal barrier on high flow (60 GPM) which is indicative of a ruptured thermal barrier.

The KC Surge Tank Vent valve, which is normally open, will receive a close signal on an EMF-46A and B alarm. However, the 'OPEN' position is latched in such that the valve will automatically reopen when the signal clears.

KA is matched because the situation described in the stem represents a loss of Nuclear Service Water concerning the CCWS (KC) system. The candidate must demonstrate knowledge of associated KC system level alarms and then demonstrate the ability to monitor a level change by the use of the associated tank curve.

This is a comprehension level question because the candidate must demonstrate the ability to use a tank curve in solving a problem whose parameters are set up in the stem of the question. He must also understand that the associated tank curve only represents one of the two compartment levels and therefore must double the results to obtain the correct answer.

Answer A Discussion

Incorrect. Plausible because Part 1 is correct. Part 2 is plausible because there are other instances where an isolation that occurs on a high EMF alarm must be manually restarted after the alarm clears (i.e. Waste Gas Release).

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Part 1 is plausible because 70 GPM is close to the actual setpoint of 60 GPM. Part 2 is plausible because other isolations that occurs on a high EMF alarm must be manually restarted after the alarm clears (i.e. Waste Gas Release).

Answer D Discussion

Incorrect. Part 1 is plausible because 70 GPM is close to the actual setpoint of 60 GPM. Part 2 is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Moved WOOTF statement to before the fill in the blank statements. Also, corrected distractor analysis to match question. Original discussion was for previous version of question. HCF 11/04/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 Technical Reference(s): OP-MC-PSS-KC Rev 25 Pg 21 and 23
 23
 Learning Objective: OP-MC-PSS-KC Obj. 5

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1853	APE062	AA1.05	Ability to operate and / or monitor the following as they apply to the Loss of Nuclear Service Water (SWS): (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> The CCWS surge tank, including level control and level alarms, and radiation alarm

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QUESTION 53

B

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QUESTION 54

A

QuestionBank #	KA_system	KA_number	KA_desc
1854	WE04	EK2.2	Knowledge of the interrelations between the (LOCA Outside Containment) and the following: (CFR: 41.7 / 45.7) □ Facility*s heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

CURRENT

Unit 1 was operating at 100%. Given the following events and conditions:

- 0210 – reactor tripped due to a LOCA
- 0300 – crew enters ECA-1.2, (LOCA Outside Containment)
- 0340 – crew enters ECA-1.1, (Loss of Emergency Coolant Recirc)
- 0350 – The crew is at step 21.b of ECA-1.1
- Current conditions:
 - 1B NC pump running, all other NC pumps secured
 - 1A NI pump is running, indicating 310 GPM
 - Both NV pumps are running, indicating 300 GPM
 - Both ND pumps off
 - Subcooling is 35°F

Which ONE (1) of the following describes the MINIMUM SI flow required and the required actions (if any)?

REFERENCE PROVIDED

- A. Minimum flow required is 305 GPM, stop both NV pumps.
- B. Minimum flow required is 315 GPM, stop one NV pump.
- C. Minimum flow required is 305 GPM, stop the running NI pump.
- D. Minimum flow required is 315 GPM, no pumps can be stopped at this time.

45 DAY VERSION

Unit 1 was operating at 100%. Given the following events and conditions:

- 0210 – reactor tripped due to a LOCA outside containment
- 0220 – crew enters ECA-1.2, (LOCA Outside Containment)
- 0230 – crew enters ECA-1.1, (Loss of Emergency Coolant Recirc)
- 0250 – The crew is at step 21.b of ECA-1.1
- Current conditions:
 - 1B NC pump running, all other NC pumps secured
 - 1 NI pump running, indicating 220 GPM
 - 1 NV pump running, indicating 385 GPM
 - Both ND pumps off
 - Subcooling is 35°F

Which ONE (1) of the following describes the MINIMUM SI flow required and the required actions (if any)?

REFERENCE PROVIDED

- A. Minimum flow required is 408 GPM, stop the running NI pump.
- B. Minimum flow required is 380 GPM, stop the running NI pump.
- C. Minimum flow required is 408 GPM, neither pump may be secured at this time.
- D. Minimum flow required is 380 GPM, neither pump may be secured at this time.

401-9 Comments:

WE04EK2.2

If the graph wasn't marked then I would agree with the distracter analysis for distracters B and D. However, since the graph is incrementally marked, it is not possible to misread it on the horizontal axis. Therefore, 380 GPM is not plausible.

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QUESTION 54

A

I do not have a suggested fix for this problem unless you can provide a curve that doesn't have the 2-9 incremental markings.
 This Q is U because 2 distracters are not plausible.
 RFA 10/28/09

General Discussion

Time after trip is 100 minutes, which makes the required flow 305 GPM.

Since the minimum flow required is 305 gpm and the flow from the running NI pump is 310 GPM, both running NV pumps should be secured.

It is a difficult K/A match to relate ECA-1.2 (LOCA Outside Containment) to the facility's heat removal systems. To match this K/A initial conditions were given which placed the plant in ECA-1.2 and then a transition to ECA-1.1 (Loss of Emergency Coolant Recirc) was made. A transition to ECA-1.1 from ECA-1.2 is a possible flow path based on plant conditions.

This is an analysis question as the applicant must interpret the graph from Enclosure 9 and then determine if a Safety Injection pump can be stopped.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect: Plausible if the applicant uses the time from the trip to the time of ECA-1.1 entry or makes a math error calculating the time after the trip. If so, a required flow of 315 GPM would be obtained and stopping 1 NV pump would be correct.

Answer C Discussion

Incorrect. Plausible if the applicant reads the part of the procedure step which directs stopping a Safety Injection pump but misses the part regarding "while maintaining flow above minimum required". The minimum flow is correct.

Answer D Discussion

Incorrect. Plausible if the applicant miscalculates the required flow as previously described the applicant could determine 315 GPM. Since neither of the individual flows is greater than 315 GPM, the applicant could believe that no pumps can be stopped.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	CNS NRC Exam Bank Question 521

401-9 Comments RESPONSE

Per Chief Examiner's comment, completely revised question such that all distractors are now plausible. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan Objective: EP-EP2 SEQ 29
 References:
 1. ECA-1.1 step 21 and Encl 9 - PROVIDED

Student References Provided

EP/1/A/5000/ECA-1.1 (Step 21)
 EP/1/A/5000/ECA-1.1 (Enclosure 9)
 (Q54)

QuestionBank #	KA_system	KA_number	KA_desc
1854	WE04	EK2.2	Knowledge of the interrelations between the (LOCA Outside Containment) and the following: (CFR: 41.7 / 45.7) □ Facility*s heat removal systems, including primary coolant, emergency coolant, the decay heat removal

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QUESTION 54

A

systems, and relations between the proper operation of these systems to the operation of the facility.

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QUESTION 55

B

QuestionBank #	KA_system	KA_number	KA_desc
1855	WE05	EK2.1	Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: (CFR: 41.7 / 45.7) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

CURRENT

Unit 2 was operating at 100% power. Given the following:

- A S/G has faulted inside Containment
- Containment pressure peaked at 3.1 PSIG and is now 2.7 PSIG and slowly decreasing
- The crew has implemented FR-H.1 (Response to Loss of Secondary Heat Sink)
- All CA flow has been lost

Which ONE (1) of the following completes the statements below?

- 1) The NEXT source of feed water that FR-H.1 will prioritize for restoration of flow to the S/Gs is through the CM/CF system using (1) ?
- 2) Based on S/G conditions, the crew would be required to establish bleed and feed when W/R level in at least 3 S/Gs is less than (2) ?

- A. 1) a Main Feed Water pump
2) 24%
- B. 1) a Main Feed Water pump
2) 36%
- C. 1) Hotwell and Booster pumps
2) 24%
- D. 1) Hotwell and Booster pumps
2) 36%

45 DAY VERSION

Given the following conditions on Unit 1:

- A Reactor Trip and Safety Injection have occurred due to a Small Break LOCA
- Both MD CA pumps and the TD CA pump failed to start and attempts to restore them have been unsuccessful
- FR-H.1 (Response to Loss of Secondary Heat Sink) has been implemented
- I&E has been dispatched to block the Feedwater Isolation in accordance with FR-H.1, Enclosure 6 (Feedwater Isolation Override)

Which ONE (1) of the following describes the required actions to regain control of CF pumps in accordance with FR H.1?

- A. Block the Feedwater Isolation ONLY
- B. Block the Feedwater Isolation AND Reset Phase A
- C. Block the Feedwater Isolation AND Reset the Sequencers
- D. Block the Feedwater Isolation AND Reset SI

401-9 Comments:

WE05EK2.1

It is common knowledge that an SI signal isolates FW and that FW cannot be regained until SI has been reset.

This Q is U because it has no DV.

RFA 10/28/09

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2009 RO NRC Retake Examination

QUESTION 55

B

General Discussion

To regain control of CF components after an SI, the SI must be reset and NORMALLY the reactor trip breakers would be closed. The sequencers are reset by procedure but not required to restore control to the CF components. During performance of FR-H.1, the reactor trip breakers are NOT closed. Instead the Feedwater Isolation signal is overridden.

This KA is match because the applicant must have knowledge of the interlocks which must be met to restore CF flow during a Loss of Secondary Heat Sink scenario.

Question is comprehensive because the candidate must evaluate a given plant scenario and apply that assessment to determine what must be done (How) to reset a safety signal. These actions could be different depending on plant conditions so this is above just straight recall for system knowledge.

Answer A Discussion

Incorrect. Plausible because using a CF pump is correct and 24% would be correct if Adverse Containment condition numbers were not in effect.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Plausible because the Hotwell and Booster pumps could be used if S/G were first depressurized. However, they are not next in order of priority. Also, 24% would be correct if Adverse Containment condition numbers were not in effect.

Answer D Discussion

Incorrect. Plausible because the Hotwell and Booster pumps could be used if S/G were first depressurized. However, they are not next in order of priority. Also, 36% is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	CNS NRC Exam Bank Question 1'028

401-9 Comments RESPONSE

Disagree with Chief Examiner's comment regarding no DV. Since the Feedwater Isolation is being blocked instead of being reset (normal method), regaining control of the CF pumps is not as straight forward as it may seem. Will discuss with Chief Examiner.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
 Lesson Plan OP-MC-CF-CF Objective 12 pages 35 and 37
 FR-H.1 pages 9 & 10

Student References Provided

QuestionBank #	KA_system	KA_number
1855	WE05	EK2.1

KA_desc
 Knowledge of the interrelations between the (Loss of Secondary Heat Sink) and the following: (CFR: 41.7 / 45.7) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

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2009 RO NRC Retake Examination

QUESTION 56

A

QuestionBank #	KA_system	KA_number	KA_desc
1856	WE11	2.4.8	WE11 GENERIC Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)

CURRENT

Given the following conditions on Unit 1:

- Unit 1 FWST level is 175 inches following indications of a Large-Break LOCA
- The crew is performing actions in ES-1.3 (Transfer to Cold Leg Recirc)
- 1NI-184B (1B ND Pump Suction From Cont Sump Isol) has failed in the CLOSED position
- Containment sump level is 3.0 feet

Which ONE (1) of the following symptoms and/or indications would require the crew to transition to ECA-1.1 (Loss of Emergency Coolant)?

- A. 1A ND Pump is lost.
- B. 1A and 1B NI pumps are lost.
- C. C/R receives report that the Unit 1 FWST is ruptured.
- D. FWST Lo Lo Level is reached with Containment sump indicating a level of 3.5 ft.

45 DAY VERSION

Given the following conditions on Unit 1:

- A Reactor Trip and Safety Injection have occurred due to a Small Break LOCA
- The crew was performing E-1 (Loss of Reactor or Secondary Coolant) and have implemented ECA-1.1 (Loss of Emergency Coolant Recirc)
- Annunciator 1AD-12 C1 (VIVS LO PRESS) is in alarm

Which ONE (1) of the following describes the requirements for implementing AP-22 (Loss of VI) in conjunction with ECA-1.1?

- A. AP-22 may be implemented concurrently with ECA-1.1. However, it must be suspended if transition is made to a Functional Restoration Procedure (FRP).
- B. AP-22 may not be implemented since no other procedures may be implemented while an ECA procedure is in effect.
- C. AP-22 may be implemented concurrently with ECA-1.1. However, the operators must use caution since an S/I has occurred.
- D. AP-22 may not be implemented since an SI has occurred. The APs are written assuming the S/I had not occurred and shall not be used if S/I has actuated.

401-9 Comments:

WE11G2.4.8

B and D are not plausible because you asked them in the stem WOOTF describes the requirements or implementing...

Therefore B and D are automatically ruled out.

Change stem: WOOTF describes whether or not AP-22 can be implemented in conjunction with ECA-1.1. (something to that affect)

I agree that this Q may be SRO ONLY

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2009 RO NRC Retake Examination

QUESTION 56

A

Replace the Q or request a new KA.
RFA 10/28/09

General Discussion

For this scenario, the applicant is presented with a set of conditions where the FWST has reached the LO Level setpoint of 180 inches. This requires the crew to transition to ES 1.3 (Transfer to CLR). There are a number of conditions which would require a transition to ECA 1.1 (Loss of ECR) namely, the loss of either both ND pumps or the inability to establish a flowpath from the containment sump to a least one of the ND pumps. The "B" Train containment sump isolation valve is given as not available therefore if either the "A" Train containment sump isolation valve cannot be opened or the "B" Train ND pump is lost, this would represent a loss of ECR capability and require a transition to ECA 1.1. The containment sump level is provided at a level which is sufficient for CLR (>2.5 feet) therefore as long as a flowpath can be established and a ND pump is available, a transition to ECA 1.1 would not be required, i.e., a rupture of the FWST

KA is matched because the candidate must understand the plant challenges that ECA 1.1 is written to address. The evaluation of transition criteria represents a applicants understanding of both the purpose and function of this procedure.

This question is analysis level because the candidate must analyze the conditions given and evaluate the applicability of a given procedure. This requires both a multi part mental process and determine the proper application of a given procedure.

Answer A Discussion

Correct: The loss of the "A" train ND pump would require a transition to ECA 1.1 as described above

Answer B Discussion

Incorrect: Plausible because without one NI pump recirc would not be possible if NC system was greater than the shutoff head of the ND pumps. However, since it is given that a large-break LOCA has occurred this is not the case.

Answer C Discussion

Incorrect: There is adequate level in the containment sump to support ECR. Plausible; A loss of FWST inventory would represent a challenge to ECR capability but with the conditions given would not require transition to ECA 1.1

Answer D Discussion

Incorrect: 3.5 feet in the containment sump is sufficient to support ECR.net. Plausible: This answer represents a significant loss of inventory sump level at this point should be approx. 7 feet. but there is sufficient sump level to support ECR.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

11/04/09 New question for replacement
K/A.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References	Student References Provided
Lesson Plan OP-MC-EP-E1 rev. 22, pages 23	
ES 1.3 (Transfer to CLR) Rev 25 Pgs 2,12 & 27	
Learning Objective: <input type="checkbox"/> OP-MC-EP-E1 Obj. 6	

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2009 RO NRC Retake Examination

QUESTION 56

A

QuestionBank #	KA_system	KA_number	KA_desc
1856	WE11	2.4.8	WE11 GENERIC Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)

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2009 RO NRC Retake Examination QUESTION 57

C

QuestionBank #	KA_system	KA_number	KA_desc
1857	APE003	AK1.07	Knowledge of the operational implications of the following concepts as they apply to Dropped Control Rod: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Effect of dropped rod on insertion limits and SDM

CURRENT

Given the following:

- Unit 1 is operating at 100% RTP with Rod Control in AUTO
- A rod in Control Bank C drops into the core
- Tave dropped to 584°F and was restored to 585°F by the OATC with the Rod Control system in MANUAL
- NC system pressure has stabilized at 2235 PSIG
- NC system boron concentration has not changed

Which ONE (1) of the following completes the statement below?

Based on the steady-state conditions above, shutdown margin (1) and rod insertion limits (2) .

- A. 1) increases
 2) decrease

- B. 1) remains the same
 2) decrease

- C. 1) remains the same
 2) remain the same

- D. 1) increases
 2) remain the same

45 DAY VERSION

Given the following:

- Unit 1 is operating at 100% RTP with Rod Control in AUTO
- A rod in Control Bank C drops into the core
- Tave dropped to 584°F and was restored to 585°F by the Rod Control system before Rod Control was placed in MANUAL
- NC system pressure has stabilized at 2235 PSIG

Based on the conditions above, shutdown margin (1) and rod insertion limits (2) .

(ASSUME XENON CONCENTRATION HAS NOT CHANGED)

- A. 1) decreases
 2) decrease

- B. 1) remains the same
 2) decreases

- C. 1) remains the same
 2) remain the same

- D. 1) decreases
 2) remain the same

401-9 Comments:

APE003AK1.07

Please re-evaluate the assumption in the question. If they know Xenon did not change, then power did not change and reactivity did not change.

This may key them to the answer.

Can the assumption be removed without affecting the question?

RFA 10/28/09

FOR REVIEW ONLY - DO NOT DISTRIBUTE

2009 RO NRC Retake Examination QUESTION 57

C

General Discussion

Shutdown margin is defined as the amount of reactivity by which the reactor is shutdown OR could be made instantaneously shutdown. With the dropped control rod, the control rods withdraw slightly to compensate for the decrease in Tave caused by the dropped rod. Since Reactor Power, Boron Concentration, and Tave are at the same value as they were prior to the dropped rod SDM does not change. Since power is the same Rod Insertion Limits remain the same.

This KA is matched because the applicant must know the effect of a dropped rod on SDM and RILs to correctly answer the question.

Question is comprehensive because the candidate must evaluate the effects of a rod drop scenario on SDM and rod insertion limits. This represents a multi part mental process and a prediction of an outcome.

Answer A Discussion

Incorrect. Part 1 is incorrect but plausible if the applicant believes that the dropped rod adds negative reactivity to the core which would increase SDM. Part 2 is plausible if the applicant does not understand the RILs are determined by reactor power.

Answer B Discussion

Incorrect. Part 1 is correct. Part 2 is plausible if the applicant does not understand the RILs are determined by reactor power.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Part 1 is incorrect but plausible if the applicant believes that the dropped rod adds negative reactivity to the core which would increase SDM. Part 2 is correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Chief Examiner's asked if statement regarding Xenon concentration not changing could be removed. Xe statement gives time reference. If Xe had started building in it would change SDM. Will discuss further with CE. Added WOOLF question. HCF 11/04/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
Lesson Plan OP-MC-RT-RB Objective 9 page 45 Lesson Plan OP-BNT-RT03 Objective 8 pages 19 and 20

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1857	APE003	AK1.07	Knowledge of the operational implications of the following concepts as they apply to Dropped Control Rod: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Effect of dropped rod on insertion limits and SDM

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2009 RO NRC Retake Examination

QUESTION 58

C

QuestionBank #	KA_system	KA_number	KA_desc
1858	APE005	AK2.02	Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7) <input type="checkbox"/> Breakers, relays, disconnects, and control room switches

CURRENT

Given the following conditions on Unit 1:

- Control Rod M-4 (Control Bank D, Group 2) indicates 186 steps on DRPI
- Bank D Group Step Counters indicate 195 steps on both banks
- I&E has determined that Control Rod M-4 is immovable due to a failure of its Lift Coil Disconnect switch
- There has been no indication that the rod is mechanically bound.
- It will take approximately 3 hours to replace the failed disconnect switch

Which ONE (1) of the following describes the OPERABILITY of Control Rod M-4 as described by Technical Specification 3.1.4 (Rod Group Alignment Limits)?

- A. The control rod does not meet alignment limits but remains OPERABLE because it can be tripped.
- B. The control rod can be tripped but is INOPERABLE because it is not within alignment limits.
- C. The control rod is OPERABLE because it can be tripped and it is within alignment limits.
- D. The control rod is within alignment limits but is INOPERABLE because it can not be moved.

45 DAY VERSION

Given the following conditions on Unit 1:

- Control Rod M-4 (Control Bank D, Group 2) indicates 186 steps on DRPI
- Bank D Group Step Counters indicate 195 steps on both banks
- I&E has determined that Control Rod M-4 is immovable due to a failure of its Lift Coil Disconnect switch
- There has been no indication that the rod is mechanically bound.
- It will take approximately 3 hours to replace the failed disconnect switch

Which ONE (1) of the following describes the OPERABILITY of Control Rod M-4 as described by Technical Specification 3.1.4 (Rod Group Alignment Limits)?

- A. The control rod does not meet alignment limits but remains OPERABLE because it can be tripped.
- B. The control rod can be tripped but is INOPERABLE because it is not within alignment limits.
- C. The control rod is OPERABLE because it is can be tripped and it is within alignment limits.
- D. The control rod is within alignment limits but is INOPERABLE because it can not be moved.

401-9 Comments:

APE005AK2.02

D is not plausible because the stem stated that there was no indication that the rod is mechanically bound in the 4th bullet. To state in D that it cannot be moved is a contradiction to the stem. The distracter analysis for D is not acceptable.

Modify or replace distracter D.

RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 58

C

General Discussion

The control rod is operable because it is still trippable (no indications otherwise). Since the control rod is within 12 steps of the group step counter position, the rod is not out of alignment as required by TS 3.1.4

The K/A is matched because the applicant must understand the relationship between the lift coil disconnect switches for the control rod and the Tech Spec operability of the rod.

This is an analysis level question because the applicant must apply multiple given indications to information recalled from memory (control rod alignment TS limits) and must comprehend that the control rod is still trippable (and therefore still operable) with the lift coil disconnect switch failed.

Answer A Discussion

Incorrect. Plausible if the applicant does not understand the control rod alignment limits and the control rod can be tripped.

Answer B Discussion

Incorrect. Plausible if applicant does not understand the control rod alignment limits.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible because control rod is within its alignment limits. The control is immovable for electrical reasons. Since it is not mechanically bound, there is no indication that the rod is not trippable. Therefore, the rod remains OPERABLE.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Chief Examiner commented that 'D' is not plausible since it contradicts the the stem ("not mechanically bound"). Not a contradiction only a clarification that it can still be tripped even though it is immovable (electrically). Fixed distractor analysis.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Technical Specification 3.1.4 Rod Group Alignment Limits

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1858	APE005	AK2.02	Knowledge of the interrelations between the Inoperable / Stuck Control Rod and the following: (CFR 41.7 / 45.7) <input type="checkbox"/> Breakers, relays, disconnects, and control room switches

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2009 RO NRC Retake Examination

QUESTION 59

A

QuestionBank #	KA_system	KA_number	KA_desc
1859	APE024	AK1.04	Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Low temperature limits for born concentration

CURRENT

Given the following conditions on Unit 1:

- An Operator in the plant reports that the FWST Heater Overtemperature light on the FWST Heater Control panel is LIT

Which ONE (1) of the following describes the operational implications of the FWST Heater overtemperature condition?

- A. All FWST heater groups are tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 70°F.
- B. Only the FWST heater group with the overtemperature condition has tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 70°F.
- C. All FWST heater groups are tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 80°F.
- D. Only the FWST heater group with the overtemperature condition has tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 80°F.

45 DAY VERSION

Given the following conditions on Unit 1:

- An Operator in the plant reports that the FWST Heater Overtemperature light on the FWST Heater Control panel is LIT

Which ONE (1) of the following describes the operational implications of the FWST Heater overtemperature condition?

- A. All FWST heater groups are tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 70°F.
- B. Only the FWST heater group with the overtemperature condition has tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 70°F.
- C. All FWST heater groups are tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 65°F.
- D. Only the FWST heater group with the overtemperature condition has tripped. The FWST will remain OPERABLE until FWST temperature decreases to less than 65°F.

401-9 Comments:

APE024AK104

CAF: The KA is for low temperature limits for Boron Concentration. This Q references an over-temperature annunciator. Is this for a high temperature or a low temperature condition? The ref does not explain well.

Stem: Is this a high Temperature or a low temperature condition?

Remove the double period from "C" and "D"

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2009 RO NRC Retake Examination

QUESTION 59

A

RFA 10/09/09

Revisited

After revisiting this Q, I think 80oF would be more plausible then 65 oF. 80 is the excessive water temperature in the RWST where 65 is the min RCS cold leg temp. Consider changing and we will discuss during the onsite review.

RFA 10/29/09

CAF: The KA is for low temperature limits for Boron Concentration. This Q references an over-temperature annunciator. Is this for a high temperature or a low temperature condition? The ref does not explain well.

Stem: Is this a high Temperature or a low temperature condition?

Remove the double period from "C" and "D"

RFA 10/09/09

General Discussion

The first part of the questions deals with FWST heater operations. The stem is questioning "heater" overtemperature not Tank overtemperature. This sometimes comes in during heater operation which would be energized to PREVENT the temperature from going low. Because the condition prevents ALL of the heaters from operating, the result would be a LOW temperature in the FWST.

In accordance with the Limits and Precaution for the FW system, the minimum temperature for the FWST is 70°F. This is also the low limit for OPERABILITY in accordance with TS 3.5.4, RWST, SLC 16.9.11, Borated Water Sources - Operating, and SLC 16.9.14, Borated Water Sources - Shutdown.

While there are no low temperature limits for boron concentration which are specific to Emergency Boration, the low temperature limit for the FWST are an operational implication tied to the operability of that water sources and its associated flowpaths under all operating conditions including times when Emergency Boration is required. Since this is a potential source of water during Emergency Boration the KA is matched.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible because there are temperature indications for each individual heater group. However, a high temperature on one group of heaters trips all groups. The temperature limit for operability is correct.

Answer C Discussion

Incorrect. It is correct that all heater groups trip. The temperature limit is plausible because it is the minimum RCS cold leg temperature.

Answer D Discussion

Incorrect. Plausible because there are temperature indications for each individual heater group. However, a high temperature on one group of heaters trips all groups. The temperature limit is plausible because it is the minimum RCS cold leg temperature.

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2009 RO NRC Retake Examination

QUESTION 59

A

401-9 Comments RESPONSE

10/14/09

Revised distracter discussion to better explain low temp angle. Will discuss with Ron when on site, should be OK. There is no double period. 11/04/09 Changed 65°F to 80°F in distractors 'C' and 'D' per Chief Examiner's recommendation.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
 SLC 16.9.11, Borated Water Sources (Operating)
 Lesson Plan OP-MC-FH-FW Objective 6 page 23,
 Objective 4 page 43 and Objective 7 page 31.

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1859	APE024	AKI.04	Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: (CFR 41.8 / 41.10 / 45.3) <input type="checkbox"/> Low temperature limits for born concentration

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2009 RO NRC Retake Examination

QUESTION 60

A

QuestionBank #	KA_system	KA_number	KA_desc
1860	APE061	AA2.04	Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: (CFR: 43.5 / 45.13) <input type="checkbox"/> Whether an alarm channel is functioning properly

CURRENT

Given the following conditions on Unit 1:

- Unit is in Mode 6
- The reactor is being defueled
- The following alarm has JUST been received in the Main Control Room:
 - "1EMF-16 (CONTAINMENT REFUELING BRIDGE)" annunciator

Which ONE (1) of the following alarms could be used to confirm that the 1EMF-16 alarm is valid?

- A. 1EMF-17 (SPENT FUEL BLDG REFUEL BRIDGE) annunciator OR SPENT FUEL POOL LEVEL LOW computer alarm.
- B. INCORE INST ROOM SUMP HI LEVEL alarm OR HIGH FLUX AT SHUTDOWN alarm.
- C. 1EMF-17 (SPENT FUEL BLDG REFUEL BRIDGE) annunciator OR 1EMF-51 (REACTOR BUILDING ACTIVITY) alarm.
- D. 1EMF-51A (REACTOR BUILDING ACTIVITY) alarm OR SPENT FUEL POOL LEVEL LOW computer alarm.

45 DAY VERSION

Given the following conditions on Unit 1:

- Unit is in Mode 6
- The reactor is being defueled
- The following alarm has JUST been received in the Main Control Room:
 - "1EMF-16 CONTAINMENT REFUELING BRIDGE" annunciator

Which ONE (1) of the following alarms could NOT be used to confirm that the 1EMF-16 alarm is valid?

(CONSIDER EACH OF THE FOLLOWING ALARMS SEPARATELY)

- A. 1EMF-51A (REACTOR BUILDING ACTIVITY) alarm
- B. 1EMF-17 (SPENT FUEL BLDG REFUEL BRIDGE) annunciator
- C. (SPENT FUEL POOL LEVEL LOW) computer alarm
- D. (INCORE INST ROOM SUMP HI LEVEL) annunciator

401-9 Comments:

APE061AA2.04

If you wanted to write this W/O it being a NOT Q, consider the following:
WOOTF alarm(s) can be used to confirm that the 1EMF-16 alarm is valid?

- A. 1EMF-17 annunciator or SFP level Low computer alarm

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2009 RO NRC Retake Examination QUESTION 60

A

- B. Incore Inst Room Sump Hi Level or IEMF-51A alarm
- C. IEMF-17 annunciator ONLY
- D. IEMF-51A alarm ONLY

RFA 10/29/09

General Discussion

For IEMF-16, other valid alarms which could be used to confirm that the alarm is valid are:

IEMF-17 (indicating a loss of Refueling Cavity and Spent Fuel Pool Level)
Spent Fuel Pool Level Low (indicating a loss of Refueling Cavity and Spent Fuel Pool Level)
Incore Inst Room Sump Hi Level (indicating a loss of Refueling Cavity and Spent Fuel Pool Level)
Any Unit Vent or Spent Fuel Building Ventilation monitor alarm (indicating fuel damage)

IEMF-51A would not be a valid alarm to confirm that IEMF-16 is valid since it is a high range alarm and should not be in alarm if IEMF-16 has just been received.

K/A is matched because the applicant must know which redundant indications can be used to evaluate whether the alarming Area Radiation Monitor is functioning properly.

Question is comprehensive because the candidate must evaluate the validity of a given alarm against a set of alternate indications. This process of understanding the relationships between the given alarm puts this question on the analysis level.

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible because Incore Room Sump Hi Level is correct and the applicant could believe that the Hi Flux At Shutdown could cause a IEMF-16 alarm as well.

Answer C Discussion

Incorrect. Plausible because IEMF-17 is correct. IEMF-51 is plausible since it detects a high radiation level in containment. However, it is not reasonable to believe that IEMF-51 would be in alarm in this condition.

Answer D Discussion

Incorrect. Plausible since Spent Fuel Pool Level Low alarm is correct. IEMF-51 is plausible since it detects a high radiation level in containment. However, it is not reasonable to believe that IEMF-51 would be in alarm in this condition.

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2009 RO NRC Retake Examination

QUESTION 60

A

401-9 Comments RESPONSE

Wrote this as a 'NOT' question due to the difficulty in coming up with sufficient plausible distractors. In the suggestion offered by Chief Examiner answers 'A' and 'C' are both correct. Discuss further with Chief Examiner during on-site review.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
AP-40, Loss of Refueling Cavity Level page 2 AP-25, Spent Fuel Damage page 2

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1860	APE061	AA2.04	Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: (CFR: 43.5 / 45.13) <input type="checkbox"/> Whether an alarm channel is functioning properly

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2009 RO NRC Retake Examination QUESTION 61

A

QuestionBank #	KA_system	KA_number	KA_desc
1861	APE067	AK3.02	Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: (CFR 41.5,41.10 / 45.6 / 45.13) □ Steps called out in the site fire protection plan, FPS manual, and fire zone manual

CURRENT

Unit 2 was operating at 100% power when an electrical fire started inside the auxiliary building cable spreading room. AP/0/A/5500/45 (Plant Fire) has been implemented.

Which ONE (1) of the following describes how the fire suppression system is actuated AND the hazards to personnel if they enter this room?

- A. An NLO is dispatched to open a manual deluge valve. An electrical shock hazard exists.
- B. Automatic sprinkler system actuation. An electrical shock hazard exists.
- C. Automatic Halon system actuation. An asphyxiation hazard exists.
- D. An NLO is dispatched to actuate a manual Cardox system. An asphyxiation hazard exists.

45 DAY VERSION

If a fire was reported in the McGuire Office Complex (MOC), which one of the following responses is correct by station procedures?

- A. Offsite fire departments are responsible for all fire suppression activities at the scene. The Fire Brigade may provide limited support if resources allow.
- B. Offsite fire departments are responsible for all fire suppression activities at the scene. The Fire Brigade cannot respond to any events outside the protected area.
- C. Fire Brigade members are responsible for fire suppression activities at the scene. An offsite fire department may be called to provide support if additional resources are required.
- D. Fire Brigade members are responsible for fire suppression activities at the scene. They are required to turn over control of the scene as soon as an offsite fire department arrives and immediately return to the protected area.

401-9 Comments:

APE067AK3.02
 According to the reference (OMP 2-2, Page 13,) A and B are both correct.
 If that is not so then:
 Change the 2nd part of A to "The fire brigade will respond."
 Change the 2nd part of B to "The fire brigade will NOT respond."

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2009 RO NRC Retake Examination QUESTION 61

A

As written, the question is leading the applicant to the correct answer.
 Currently, the Q is U because of two correct answers.
 RFA 10/29/09

General Discussion

OP-MC-SS-RFY (p37) states that manually operated Mulsifyre systems are provided for the Unit 1 and Unit 2 cable rooms and ETA HVAC equipment rooms. These systems are further described as "Consisting of a number of open spray nozzles with locked closed manual isolation valves."

The K/A is matched because it requires the applicant to know the procedure requirements related to initiating the fire suppression system for the auxiliary building cable spreading room.

Answer A Discussion

CORRECT

Answer B Discussion

Incorrect. Plausible: Extensive use of Automatic deluge systems is employed at McGuire, typically protecting systems containing oil, or other class B fuels, as well as ventilation systems. This system is not automatically operated OP-MC-SS-RFY (p37)

Answer C Discussion

Incorrect. Plausible: Halon 1301 Total Flooding systems are used in the DG Rooms, the CA Pump rooms and the Computer Room in the Admin Building. Plausible because Halon does provide protection against electrical fires by removing oxygen OP-MC-SS-RFY.

Answer D Discussion

Incorrect. CARDOX gas is a personnel hazard – although all the CARDOX systems have been replaced with HALON, the pull switches still say CARDOX in some areas (like the diesel generators). Also storage areas on site with CARDOX systems.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Exam Bank

401-9 Comments RESPONSE

Question replaced after final site review due to original question being SRO level knowledge. Approved RFA 11/12/09

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References	Student References Provided
Lesson Plan OP-MC-SS-RFY pages 37, 47, 49, 51, and 53	

QuestionBank #	KA_system	KA_number	KA_desc
1861	APE067	AK3.02	Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site: (CFR 41.5,41.10 / 45.6 / 45.13) □ Steps called out in the site fire protection plan, FPS manual, and fire zone manual

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2009 RO NRC Retake Examination

QUESTION 62

C

QuestionBank #	KA_system	KA_number	KA_desc
1862	APE068	2.1.28	APE068 GENERIC Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

CURRENT

Which ONE (1) of the following describes the expected method of Pressurizer level control, in accordance with AP-24 (Loss of Plant Control Due to Fire or Sabotage)?

- A. Maintain level at 25% by cycling the Standby Makeup pump and by letdown flow through the Reactor Vessel Head vents (NV-272 and NV-273).
- B. Maintain level between 60-80% with either Normal or Excess Letdown flow and manual adjustment of Charging Line Flow Control valve (NV-238) and NCP Seal Injection flow (NV-241).
- C. Maintain level between 60-80% through adjustment of the Reactor Vessel Head vents (NV-272 and NV-273) with charging supplied by the Standby Makeup pump through the NCP seals.
- D. Maintain level at 25% utilizing letdown flow through Normal or Excess Letdown and manual adjustment of Charging Line Flow Control valve (NV-238).

45 DAY VERSION

Which ONE (1) of the following describes the expected method of Pressurizer level control, in accordance with AP-24 (Loss of Plant Control Due to Fire or Sabotage)?

- A. Maintain level approximately 25% by cycling charging (Standby Makeup pump Start/Stop) and letdown flow (Reactor Vessel Head vents, NV-272 and NV-273).
- B. Maintain level between 60-80% with either Normal or Excess Letdown flow and manual adjustment of Charging Line Flow Control valve, NV-238 and NCP Seal Injection flow, NV-241.
- C. Maintain level approximately 60-80% through adjustment of the Reactor Vessel Head vents, NV-272 and NV-273, with charging supplied by the Standby Makeup pump through the NCP seals.
- D. Maintain level approximately 25%, utilizing letdown flow (Normal or Excess Letdown) and manual adjustment of Charging Line Flow Control valve, NV-238.

APE068G2.1.28
 No comment at this time
 RFA 10/29/09

401-9 Comments:

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2009 RO NRC Retake Examination

QUESTION 62

C

General Discussion

In accordance with AP/24, the operator at the SSF will control presurizer level by cycling the Reactor Vessel Head vents. Charging is supplied by the Standby Makeup Pump through the NC Pump Seals.

This K/A is matched because the applicant must know the function of various components during a scenario when the Control Room must be evacuated and controlled from a remote facility. In this case the applicant must know the difference in how components function when operated from the SSF as opposed to the ASP.

Answer A Discussion

Incorrect. The level is plausible as it is the correct level that would be maintained if the plant was being controlled from the ASP in accordance with AP/17. Charging is via the standby makeup pump but it remains in operation and is not cycled.

Answer B Discussion

Incorrect. Correct level wrong flowpath for letdown flow and wrong flowpath for charging. Flowpaths are plausible because they are the normal flowpaths for letdown or charging.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Wrong level and wrong flowpaths. Level is plausible as this is the level if the plant was being controlled from the ASP. Flowpaths are plausible as they are normal charging and letdown flowpaths.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Bank Question CPSS006

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP/24, Loss of Plant Control Due to Fire or Sabotage, page 7 and 9

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1862	APE068	2.1.28	APE068 GENERIC Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

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2009 RO NRC Retake Examination

QUESTION 63

C

QuestionBank #	KA_system	KA_number	KA_desc
1863	WE03	EK3.2	Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization) (CFR: 41.5 / 41.10, 45.6 / 45.13) □ Normal, abnormal and emergency operating procedures associated with (LOCA Cooldown and Depressurization).

CURRENT

Which ONE (1) of the following describes the basis for establishing conditions so that only one NC pump is running during the performance of ES-1.2 (Post LOCA Cooldown and Depressurization)?

1. Minimize house electrical loads
2. Provide normal Pressurizer Spray
3. Eliminate stratification in the S/Gs
4. Provide mixing of NC system water
5. Minimize NC system heat input

- A. 2, 3, 5
B. 1, 2, 4
C. 2, 4, 5
D. 1, 2, 3

45 DAY VERSION

Which ONE (1) of the following describes the basis for establishing conditions so that only one NC pump is running during the performance of ES-1.2 (Post LOCA Cooldown and Depressurization)?

1. Minimize house electrical loads
2. Provide normal Pressurizer Spray
3. Eliminate stratification in the S/Gs
4. Provide mixing of NC system water
5. Minimize NC system heat input

- A. 2, 3, 5
B. 1, 2, 4
C. 2, 4, 5
D. 1, 2, 3

401-9 Comments:

WE03EK3.2
No comment at this time
RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 63

C

General Discussion

Once NC subcooling, Pzr level, and other NC support conditions are established, a NC pump can be started if no NC pumps are running. If more than one NC pump is running, all but one are stopped to minimize NC heat input. The NC pump restarted (or left running) is used to provide normal Pzr spray and mix the NC.

The K/A is since the applicant must have knowledge of the basis for the major action category in ES-1.2, Post LOCA Cooldown and Depressurization.

Answer A Discussion

Incorrect. Plausible since "5" is the primary reason for establishing only one NCP running. "1" & "3" are plausible since they are bases for major actions in other Emergency Procedures.

Answer B Discussion

Incorrect. Plausible since 2 and 4 are correct. Also 1 is a basis for major actions in other Emergency Procedures.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible since 2 is correct. Also 1 and 3 are bases for major actions in other Emergency Procedures.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan OP-MC-EP-E1 Objective 3

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1863	WE03	EK3.2	Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization) (CFR: 41.5 / 41.10, 45.6 / 45.13) <input type="checkbox"/> Normal, abnormal and emergency operating procedures associated with (LOCA Cooldown and Depressurization).

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2009 RO NRC Retake Examination

QUESTION 64

C

QuestionBank #	KA_system	KA_number	KA_desc
1864	WE09	EA1.1	Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operations) (CFR: 41.7 / 45.5 / 45.6) Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

CURRENT

Unit 1 has entered AP-09 (Natural Circulation). The following conditions are observed:

1. NC system subcooling > 0°F
2. NC system hot leg temperatures at saturation temperature for S/G pressure
3. NC system cold leg temperatures going up slowly
4. NC system hot leg temperatures going down
5. S/G pressure stable
6. NC system cold leg temperatures at saturation temperature for S/G pressure
7. NC system pressure stable
8. Core Exit T/C's stable

Which ONE (1) of the following sets of conditions confirm that Natural Circulation exists and is effective in cooling the core?

- A. 1, 3, 4, 5, 7
- B. 2, 4, 6, 7, 8
- C. 1, 4, 5, 6, 8
- D. 1, 2, 3, 5, 7

45 DAY VERSION

Unit 1 has entered AP-09 (Natural Circulation). The following conditions are observed:

1. NC system subcooling > 0°F
2. NC system hot leg temperatures at saturation temperature for S/G pressure
3. NC system cold leg temperatures going up slowly
4. NC system hot leg temperatures going down
5. S/G pressure stable
6. NC system cold leg temperatures at saturation temperature for S/G pressure
7. NC system pressure stable
8. Core Exit T/C's stable

Which ONE (1) of the following sets of conditions confirm that Natural Circulation exists and is effective in cooling the core?

- A. 1, 3, 4, 5, 7
- B. 2, 4, 6, 7, 8
- C. 1, 4, 5, 6, 8
- D. 1, 2, 3, 4, 5

401-9 Comments:

WE09EA1.1

I think this is a comprehensive Q since a fair amount of evaluation is required.

RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 64

C

General Discussion

The indications of Natural Circulation are:

1. NC Subcooling - Greater than 0°F
2. S/G Pressures - Stable or going down
3. NC T-Hots - Stable or going down
4. Core Exit T/Cs - Stable or going down
5. NC T-Colds - At saturation temperature for S/G pressure

This KA is matched because in order for the applicant to monitor components associated with Natural Circulation, they must know which instruments are monitored to determine that Natural Circulation exist and must also know how those indications should be trending.

This is a comprehension level question because the applicant must analyze all conditions to determine all conditions that define Natural Circulation.

Answer A Discussion

Incorrect. 1, 4, and 5 are correct. If the candidate confuses Nat Circ (loss of all NC pumps) with the loss of 1 NC pump where T-Cold would increase, 3 is plausible. 7 is plausible since most parameters are "stable or going down" when monitoring for NC.

Answer B Discussion

Incorrect. Plausible since 4, 6, and 8 are correct. 2 would be correct if it was T-Colds. 7 is plausible since most parameters are "stable or going down" when monitoring for NC.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible since 1, and 5 are correct. If the candidate confuses Nat Circ (loss of all NC pumps) with the loss of 1 NC pump where T-Cold would increase, 3 is plausible. 2 would be correct if it was T-Colds. 7 plausible as described above.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS Bank Question AP09003

401-9 Comments RESPONSE

Per Chief Examiner's suggestion, changed this to a comprehension level question.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

AP/1&2/A/5500/09, Natural Circulation Background Document, pages 3 and 4
 AP/1&2/A/5500/003, Natural Circulation Enclosure 1 Natural Circulation Parameters

Student References Provided

QuestionBank #	KA_system	KA_number
1864	WE09	EA1.1

KA_desc

Ability to operate and / or monitor the following as they apply to the (Natural Circulation Operations) (CFR: 41.7 / 45.5 / 45.6) □ Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

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2009 RO NRC Retake Examination QUESTION 64

C

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2009 RO NRC Retake Examination

QUESTION 65

B

QuestionBank #	KA_system	KA_number	KA_desc
1865	WE13	2.2.37	WE13 GENERIC Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12)

CURRENT

Given the following conditions on Unit 1:

- An inadvertent Main Steam Isolation resulted in a Reactor Trip.
- FR-H.4 (Response to Loss of Normal Steam Release Capability) has been implemented due to a Yellow Path on Heat Sink
- The Main Steam Safety valves (MSSVs) have reduced S/G pressures to 1200 PSIG

- 1) What indications on MC-2 are required to be present to allow for S/G PORV operation?
- 2) Based on current conditions, how many MSSVs per S/G should be open?

- A. 1) S/G PORV RESET lights – LIT ONLY
2) 2
- B. 1) Main Steam Isolation RESET light – LIT, S/G PORV RESET lights – LIT
2) 2
- C. 1) S/G PORV RESET lights – LIT ONLY
2) 3
- D. 1) Main Steam Isolation RESET light – LIT, S/G PORV RESET lights – LIT
2) 3

45 DAY VERSION

Given the following conditions on Unit 1:

- An inadvertent Main Steam Isolation resulted in a Reactor Trip.
- FR-H.4 (Response to Loss of Normal Steam Release Capability) has been implemented due a Yellow Path on Heat Sink
- The Main Steam Safety valves (MSSVs) have reduced S/G pressures to 1200 PSIG

- 1) What indications on MC-2 are required to be present to allow for S/G PORV operation?
- 2) Based on current conditions, how many MSSVs should be open?

- A. 1) S/G PORV RESET lights – LIT ONLY
2) 2 MSSVs on each S/G should be open
- B. 1) Main Steam Isolation RESET light – LIT, S/G PORV RESET lights – LIT
2) 2 MSSVs on each S/G should be open
- C. 1) S/G PORV RESET lights – LIT ONLY
2) 3 MSSVs on each S/G should be open
- D. 1) Main Steam Isolation RESET light – LIT, S/G PORV RESET lights – LIT
2) 3 MSSVs on each S/G should be open

401-9 Comments:

WE13G2.2.37
No comment at this time
RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 65

B

General Discussion

For the S/G PORVs to operate automatically or manually using the Manual Loaders on the Main Control Board, the Main Steam Isolation must be reset and the S/G PORVs must be reset.

MSSV Setpoints - 1170, 1190, 1205, 1220, 1225 (PSIG). Therefore 2 MSSVs should be open based on plant conditions.

The K/A is met because the applicant must determine what conditions must be met for the S/G PORVs to be available and must also determine how many MSSVs should be operating based on plant conditions.

This K/A is comprehension level because the applicant must evaluate a given set of conditions, recall from memory the MSSV setpoints and the interlocks for S/G PORV operation, and associate those pieces of information to obtain the correct answer.

Answer A Discussion

Incorrect. SG PORVs must be reset but MSI must be reset also. Number of MSSVs open is correct.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. SG PORVs must be reset but MSI must be reset also. 2 MSSVs should be open instead of 3.

Answer D Discussion

Incorrect. Reset lights are correct. 2 MSSVs should be open instead of 3.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

OP-MC-STM-SM Objectives 9 and 7 pages 15, 17, 19 and 23

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1865	WE13	2.2.37	WE13 GENERIC <input type="checkbox"/> Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7 / 43.5 / 45.12)

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QUESTION 66

D

QuestionBank #	KA_system	KA_number	KA_desc
1866	GEN2.1	2.1.28	Conduct of Operations Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)

CURRENT

Which ONE (1) of the following correctly describes the function of the Pressurizer Pressure Control Selector Switch?

- A. In the "1-3" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 3 actuates PORV 32B & 34A.
- B. In the "3-2" Position, CHANNEL 2 inputs the master pressure controller and CHANNEL 3 actuates PORV 32B & 36B.
- C. In the "1-2" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 2 actuates PORV 32B & 34A.
- D. In the "1-4" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 4 actuates PORV 32B & 36B.

45 DAY VERSION

Which ONE (1) of the following correctly describes the function of the Pressurizer Pressure Control Selector Switch?

- A. In the "1-3" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 3 actuates PORV 32B & 34A.
- B. In the "3-2" Position, CHANNEL 2 inputs the master pressure controller and CHANNEL 3 actuates PORV 32B & 36B.
- C. In the "1-2" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 2 actuates PORV 32B & 34A.
- D. In the "1-4" Position, CHANNEL 1 inputs the master pressure controller and CHANNEL 4 actuates PORV 32B & 36B.

401-9 Comments:

G2.1.28
No comment at this time
RFA 10/29/09

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2009 RO NRC Retake Examination QUESTION 66

D

General Discussion

In the "1-4" position, Channel 1 inputs the Master Pressure Controller and Channel 4 actuates PORV 32B and 36B.

The K/A is matched since the applicant must have knowledge of the function of the Pressurizer Pressure Control Selector Switch.

Answer A Discussion

Incorrect. There is NO "1-3" position for the Pressurizer Pressure Control Selector Switch. However, this answer is still plausible since there is a "1-3" position for the Pressurizer Level Control Selector Switch. The applicant could confuse the two.

Answer B Discussion

Incorrect. Plausible because this is one of the positions on the selector switch. However, Channel 3 inputs the Master Pressure Controller and Channel 2 actuates PORV 32B and 36B.

Answer C Discussion

Incorrect. Plausible because this is the normal position of the selector switch and Channel 1 inputs the Master Pressure Controller. Channel 2 does actuate the PORVs. However, it actuates 32B and 36B and not 34A.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	From MNS Exam Bank Question PSIFE004

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References

Lesson Plan OP-MC-PS-IPE Figure 7.1

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1866	GEN2.1	2.1.28	Conduct of Operations □ Knowledge of the purpose and function of major system components and controls. (CFR: 41:7)

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2009 RO NRC Retake Examination

QUESTION 67

D

QuestionBank #	KA_system	KA_number	KA_desc
1867	GEN2.1	2.1.30	Conduct of Operations□Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

CURRENT

The SSF Diesel Generator is operating in the EMERGENCY Mode AND the Break Glass Station Overspeed Shutdown Bypass Switch is in the "Bypass" position.

Which ONE (1) of the following lists ALL SSF Diesel Generator trips in addition to the Overspeed trip that are bypassed?

- A. Generator Differential ONLY.
- B. Low Lube Oil Pressure ONLY.
- C. Generator Differential and Low Lube Oil Pressure Trips ONLY.
- D. Generator Differential, Low Lube Oil Pressure, and High Jacket Water Temperature Trips.

45 DAY VERSION

Given the following conditions on Unit 1:

- The unit was operating at 100% RTP
- A spurious Safety Injection signal occurs on both trains

Which ONE (1) of the following describes the MINIMUM requirements to regain control of ESF equipment and stop one of the RN pumps during the recovery from the spurious SI?

- A. Reset Sequencer ONLY.
- B. Depress the Safety Injection RESET pushbuttons ONLY.
- C. Depress the Safety Injection RESET pushbuttons AND depress the Diesel Generator Sequencer RESET pushbuttons.
- D. Depress the Safety Injection RESET pushbuttons AND momentarily place the Reactor Trip Breaker control switches to CLOSE.

401-9 Comments:

G2.1.30

This Q does not have anything to do with locating/operating local controls. I suggest writing a Q where the CR had to be evacuated and the operator has to report to a local station to operated equipment.

This Q is U because the KA is not met

RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 67

D

General Discussion

When the engine is started a Fuel Oil Solenoid Valve energizes to open and admit fuel oil to the engine. If the D/G does not start or trips without apparent cause the problem may be an electrical failure of the Fuel Oil Solenoid valve. This solenoid valve can be bypassed by turning a manual knob located on the valve. Opening this bypass valve bypasses all engine trips (including manual stop).

This K/A is matched because the Operator has been directed to operate a local control at the SSF and must know the implications of operating that control.

Answer A Discussion

Incorrect. Plausible because this trip is bypassed. However, there are others that are bypassed also.

Answer B Discussion

Incorrect. Plausible because this trip is bypassed. However, there are others that are bypassed also.

Answer C Discussion

Incorrect. Plausible because these trips are bypassed. However, there are others that are bypassed also.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	MNS Exam Bank Question CPAD015.

401-9 Comments RESPONSE

Per Chief Examiner's comment, changed question to ask about the operation of a 'local' control at the SSF as opposed to a control in the Control Room. HCF 11/04/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan OP-MC-CP-AD Objective 3 page 31

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1867	GEN2.1	2.1.30	Conduct of Operations <input type="checkbox"/> Ability to locate and operate components, including local controls. (CFR: 41.7 / 45.7)

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2009 RO NRC Retake Examination QUESTION 68

A

QuestionBank #	KA_system	KA_number	KA_desc
1868	GEN2.1	2.1.31	Conduct of Operations Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (CFR: 41.10 / 45.12)

CURRENT

Given the following conditions on Unit 2:

- An NC system cooldown and depressurization is in progress in preparation for refueling.
- Annunciator 2AD-6 / A12 (PORV LO PRESS MODE NOT SELECTED) alarms

Which ONE (1) of the following sets of conditions could have caused this alarm?

- A.
 - NC system **temperature** less than 320°F
 - 2NC34A OR 2NC32B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- B.
 - NC system **pressure** less than 380 PSIG
 - 2NC34A OR 2NC32B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- C.
 - NC system **temperature** less than 320°F
 - 2NC34A OR 2NC36B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- D.
 - NC system **pressure** less than 380 PSIG
 - 2NC34A OR 2NC36B PORV OVERPRESS PROTECTION SELECT switches in "NORM"

45 DAY VERSION

Given the following conditions on Unit 2:

- An NC system cooldown and depressurization is in progress in preparation for refueling.
- Annunciator 2AD-6 A12 (PORV LO PRESS MODE NOT SELECTED) alarms

Which ONE (1) of the following could have caused this alarm?

- A.
 - NC system temperature less than 320°F
 - 2NC34A OR 2NC32B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- B.
 - NC system pressure less than 380 PSIG
 - 2NC34A OR 2NC32B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- C.
 - NC system temperature less than 320°F
 - 2NC34A OR 2NC36B PORV OVERPRESS PROTECTION SELECT switches in "NORM"
- D.
 - NC system pressure less than 380 PSIG
 - 2NC34A OR 2NC36B PORV OVERPRESS PROTECTION SELECT switches in "NORM"

401-9 Comments:

G2.1.31
 No comment at this time
 RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 68

A

General Discussion

Annunciator 1AD-6/A12, PORV LO PRESS MODE NOT SELECTED will alarm if NC system WR temperature is less than 320°F with EITHER PORV Overpressure Protection Select switch (NC34A or NC32B) not selected to "Low Press" (i.e. in "NORM").

This KA is matched because the applicant must evaluate an alarm that is received and evaluate what could have caused this alarm. Evaluating what could have caused this alarm constitutes a determination of whether plant components (i.e. the PORV Overpressure Protection Select switches) are correctly aligned for current plant conditions.

This question is analysis level as the applicant must analyze the alarm and associate two separate pieces of information with that alarm (i.e. NC System Temperature and which PORVs are operated by LTOP).

Answer A Discussion

CORRECT.

Answer B Discussion

Incorrect. Plausible because 380 PSIG is the new PORV lift setpoint when the PORV Overpressure Protection Select switches are selected to "Low Press". The PORVs listed are correct.

Answer C Discussion

Incorrect. Plausible because the NC temperature is correct. Either of two PORVs selected to "NORM" will cause the alarm however, 2NC26B is not one of the PORVs used for LTOP.

Answer D Discussion

Incorrect. Plausible because 380 PSIG is the new PORV setpoint when the PORV Overpressure Protection Select switches selected to "Low Press". Either of two PORV select switches to "NORM" will cause alarm. However, 2NC36B is not one of them.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan OP-MC-PS-NC Objective 14 page 35
 OP/1/A/6100/10 G, Annunciator Response for Panel
 1AD-6 page 15

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1868	GEN2.1	2.1.31	Conduct of Operations <input type="checkbox"/> Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup. (CFR: 41.10 / 45.12)

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2009 RO NRC Retake Examination

QUESTION 69

A

QuestionBank #	KA_system	KA_number	KA_desc
1869	GEN2.2	2.2.21	Equipment Control Knowledge of pre- and post-maintenance operability requirements. (CFR: 41.10 / 43.2)

CURRENT

Given the following plant conditions:

- Unit 1 is in MODE 3
- The OATC has just denied a request from maintenance to close 1ND-15B (Train B ND TO HOT LEG ISOL) for valve stroke time testing.

Which ONE (1) of the following describes the reason for the OATC's decision?

- A. Both trains of ND will become INOPERABLE.
- B. 1ND-15B would cause one ND train to become INOPERABLE.
- C. 1ND-15B is interlocked with 1ND-58A (TRAIN A ND TO NV & NI).
- D. 1ND-15B is interlocked with 1NI-136B (B NI PUMP SUCTION FROM ND).

45 DAY VERSION

Given the following plant conditions:

- Unit 1 is in MODE 3
- The OATC has just denied a request from maintenance to close 1ND-15B (Train B ND TO HOT LEG ISOL) for valve stroke time testing.

Which ONE (1) of the following describes the reason for the OATC's decision?

- A. 1ND-15B is interlocked with 1ND-58A (TRAIN A ND TO NV & NI) and this will defeat the interlock and prevent 1ND-58A from opening.
- B. Although this would be permitted in MODE 3, closing 1ND-15B would cause one ND train to become INOPERABLE and is prohibited in MODE 4.
- C. 1ND-15B is interlocked with 1NI-136B (B NI PUMP SUCTION FROM ND) and will defeat the interlock and prevent 1ND-58A (TRAIN A ND TO NV & NI) from opening.
- D. This action would isolate the cross tie between the ND trains which ensures one ND pump can inject into all four NC loops. Closing it in MODE 3 would make both trains of ND INOPERABLE.

401-9 Comments:

Remove double period from "A" and "C"

Distracter analysis: "D" what does "the exposure will be greater if you wear the respirator" have to do with this Q?
"B" and "D": remove "to provide ..." as this is teaching. Plus it is additional information that is not needed.

RFA 10/09/09

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QUESTION 69

A

General Discussion

These motor operated valves are controlled from the ND section of MC11 in the Control Room by open/close pushbuttons. These 'fail as is' valves provide cross tie isolations for the ND Trains. These valves have no auto open/close control features. These valves are opened in standby readiness, but closed in cold leg recirc. On an ECCS actuation, the ND System must be capable of providing flow to all four NCS loops (even with single failure). By having ND-15B and ND-30A open, either ND pump is capable of supplying all four NCS loops. Therefore, closing either ND-15B or ND-30A in Mode 1, 2, or 3 will make both ND trains inoperable. An alarm is actuated on the BOP panel whenever either of these valves reaches the 'closed' position.

KA is matched because know the operability requirements for a proposed maintenance activity on a given component. Specifically, why the component cannot even be repositioned.

Question is comprehensive because the candidate must evaluate a given plant condition and mode and then evaluate the effect of a give component manipulation on system operability. This requires not only the recall of system knowledge but application of that knowledge to a given set of conditions.

Answer A Discussion

CORRECT

Answer B Discussion

Incorrect. Plausible: Because it is a 'B' train valve it would be reasonable for a candidate to believe that it would only affect the 'B' train of ND

Answer C Discussion

Incorrect. Plausible IND-58A is interlocked with other 'B' train valves.. There are many interlocks associated with the train related electric valves associated with the ND system and would not be unreasonable to confuse this valve in that scheme.

Answer D Discussion

Incorrect. Plausible. There are many interlocks associated with the train related electric valves associated with the ND system and would not be unreasonable to confuse this valve in that scheme

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	MNS PSND019

401-9 Comments RESPONSE

Revised per Chief Examiner's suggestion. Rearranged answers for psychometric balance. Answer 'A' is same correct answer as 'D' was before revision. HCF 11/05/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Technical Reference(s): OP-MC-PS-ND Rev 40
Pg 39
Learning Objective: OP-MC-PS-ND, Obj. 9

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1869	GEN2.2	2.2.21	Equipment Control <input type="checkbox"/> Knowledge of pre- and post-maintenance operability requirements. (CFR: 41.10 / 43.2)

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2009 RO NRC Retake Examination QUESTION 69

A

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2009 RO NRC Retake Examination

QUESTION 70

B

QuestionBank #	KA_system	KA_number	KA_desc
1870	GEN2.2	2.2.35	Equipment Control <input type="checkbox"/> Ability to determine Technical Specification Mode of Operation. (CFR: 41.7 / 41.10 / 43.2 / 45.13)

CURRENT

Given the following conditions on Unit 1:

- NC system temperature is 85°F
- Reactor Vessel head assembly is complete in preparation for Startup
- One Reactor Vessel head bolt was discovered not fully tensioned and has subsequently been re-tensioned

Which ONE (1) of the following describes the current plant MODE and the Reactivity Condition requirements which apply per Technical Specification Definitions?

- A. MODE 5, K_{eff} must be less than 0.95
- B. MODE 5, K_{eff} must be less than 0.99
- C. MODE 6, K_{eff} must be less than 0.95
- D. MODE 6, K_{eff} must be less than 0.99

45 DAY VERSION

Given the following conditions on Unit 1:

- NC system temperature is 85°F
- All Reactor Vessel head bolts are fully tensioned
- Reactor Vessel head disassembly is in progress in preparation for Refueling

Which ONE (1) of the following describes the current plant MODE and the Reactivity Condition requirements which apply (if any) per Technical Specifications?

- A. MODE 5, K_{eff} must be less than 0.95
- B. MODE 5, K_{eff} must be less than 0.99
- C. MODE 6, K_{eff} must be less than 0.95
- D. MODE 6, no Reactivity Condition requirements

401-9 Comments:

G2.2.35

I think C and D will immediately be eliminated but it meets NUREG requirements. The Q is OK as is.
RFA 10/29/09

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2009 RO NRC Retake Examination QUESTION 70

B

General Discussion

MODE 5 is defined as <200°F with Keff <.99 and all reactor vessel head closure bolts fully tensioned. MODE 6 is defined as <200°F with at least one reactor vessel head closure bolt not fully tensioned. There are no reactivity condition requirements defined for MODE 6 in the MODE table in Tech Specs. However, the COLR requires that the reactivity condition requirement for MODE 6 is <0.95.

This KA is met because the applicant must evaluate a given set of conditions and determine the plant MODE and additional conditions which apply to that MODE.

This is an analysis level question because the applicant must associate three pieces of information to determine the correct answer. The candidate must recall from memory the general requirements for MODE 5 & 6 from the table in Tech Specs. The applicant must then determine from the given information that all reactor vessel head bolts are fully tensioned applying a note in the TS Table to differentiate between MODE 5 and MODE 6. The applicant must then recall the reactivity condition which applies to that MODE.

Answer A Discussion

Incorrect. This is the correct MODE. However, the required Keff is <0.99. Less than 0.95 is plausible as this is the required reactivity condition for MODE 6 described in the COLR.

Answer B Discussion

CORRECT.

Answer C Discussion

Incorrect. Mode 6 is plausible since one head bolt was discovered to be not fully tensioned. However, after retensioning the unit returned to Mode 5. Also, the COLR requires Keff <0.95 for MODE 6.

Answer D Discussion

Incorrect. Mode 6 is plausible since one head bolt was discovered to be not fully tensioned. However, after retensioning the unit returned to Mode 5. Keff less than .99 is plausible as that is the required reactivity condition for Mode 5.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
TS 1.1 Definitions, Table 1.1-1 MODES COLR 2.1, Operational Requirements for MODE 6

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1870	GEN2.2	2.2.35	Equipment Control <input type="checkbox"/> Ability to determine Technical Specification Mode of Operation. (CFR: 41.7 / 41.10 / 43.2 / 45.13)

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2009 RO NRC Retake Examination

QUESTION 71

D

QuestionBank #	KA_system	KA_number	KA_desc
1871	GEN2.3	2.3.12	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)

CURRENT

Given the following:

- A rapid load reduction from 100% power to 60% power was performed on Unit 1 approximately 3 hours ago.
- 1RAD-2 / C3 (1EMF 48 REACTOR COOLANT HI RAD) annunciator is LIT
- Chemistry confirms that reactor coolant I-131 activity indicates that fuel damage has occurred.

In accordance with AP-18 (High Activity in Reactor Coolant), which ONE (1) of the following methods would be used to reduce the activity levels in the NC system?

- A. Ensure an NC filter is in service.
- B. Raise letdown flow to 120 GPM.
- C. Divert letdown flow to the Recycle Holdup Tank.
- D. Place the Cation demineralizer in service.

45 DAY VERSION

Given the following:

- A rapid load reduction from 100% power to 60% power was performed on Unit 1 approximately 3 hours ago.
- 1RAD-2 C3 (1EMF 48 REACTOR COOLANT HI RAD) annunciator is LIT
- Chemistry confirms that reactor coolant I-131 activity indicates that fuel damage has occurred.

Which ONE (1) of the following actions would reduce the radiation levels in the Auxiliary Building caused by this event?

- A. Ensure an NC filter is in service.
- B. Raise letdown flow to 120 GPM.
- C. Place the Cation demineralizer in service.
- D. Ensure 1NV-127A (L/D Hx Outlet 3-way Temp Cntrl) in "VCT" position

401-9 Comments:

G2.3.12
D is not plausible for this failed fuel event. It is common knowledge to redirect letdown.
Replace D.
RFA 10/29/09

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2009 RO NRC Retake Examination QUESTION 71

D

General Discussion

Since the high activity is due to failed fuel, the appropriate action would be to ensure that a mixed bed demineralizer is in service (per AP-18).

K/A is matched because the candidate is asked to evaluate a given set of plant conditions which represent a concern with elevated radiation levels in the auxiliary building. He is then asked to evaluate actions which would result in lowering the rad levels. This is consistent with the radiological safety principle of ALARA and the actions described are operational in nature and therefore not part of general rad working training.

This is a comprehensive level question because the candidate must evaluate multiple pieces of information given and then analyze a proposed set of actions to take and arrive at an appropriate conclusion for the correct course of action.

Answer A Discussion

Incorrect. Plausible if the high activity is due to a crud burst.

Answer B Discussion

Incorrect. Plausible if the high activity is due to a crud burst.

Answer C Discussion

Incorrect. Plausible because diverting letdown flow to the RHT would reduce NC system activity levels due to dilution. However, it is not the method prescribed by AP-18.

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	CNS 2006 NRC Q71 (Bank 148)

401-9 Comments RESPONSE

Per Chief Examiner's recommendation, replaced distractor 'D'. Then, swapped answers 'C' and 'D' for psychometric balance making answer 'D' the correct answer instead of 'C'. HCF 11/05/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP-18, High Activity in Reactor Coolant page 3

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1871	GEN2.3	2.3.12	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)

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2009 RO NRC Retake Examination

QUESTION 72

C

QuestionBank #	KA_system	KA_number	KA_desc
1872	GEN2.3	2.3.14	Radiation Control Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

CURRENT

After realigning the NV system for startup, a valve located in a high radiation area requires independent verification.

Given the following conditions:

- General area radiation levels are 130 MREM / hr
- Estimated time to independently verify the position is 10 minutes
- There are no known hot spots in the area
- There is no airborne activity in this room
- The room has no surface contamination areas

What are the ALARA requirements related to waiving the independent verification of this valve per NSD 700 (Verification Techniques)?

- A. Independent verification may be waived for all valves in high radiation areas until after shutdown.
- B. Independent verification may NOT be waived until General Area radiation levels are reduced to less than 100 MREM / hr.
- C. Independent verification may be waived because the exposure to the operator exceeds ALARA guidelines.
- D. Independent verification may NOT be waived because exposure to the operator will be within ALARA guidelines.

45 DAY VERSION

After realigning the NV system for startup, a valve located in a high radiation area requires independent verification.

Given the following conditions:

- General area radiation levels are 130 MREM / hr
- Estimated time to independently verify the position is 10 minutes
- There are no known hot spots in the area
- There is no airborne activity in this room
- The room has no surface contamination areas

What are the ALARA requirements (if any) for waiving the independent verification of this valve?

- A. Independent verification may be waived after an evaluation by the NLO.
- B. Independent verification is waived for all valves in high radiation areas until after shutdown.
- C. Independent verification may not be waived for ALARA considerations under these conditions.
- D. Independent verification may be waived because the exposure to the operator exceeds ALARA guidelines.

401-9 Comments:

G2.3.14

Distracter A is weak. This is too important of an evolution to be evaluated and approved by an NLO.

Replace A.

Distracter C: State a reason instead of "under these conditions"

RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 72

C

General Discussion

According to NSD-700, Independent and/or Concurrent Verification may be waived if the exposure to an individual of greater than 10 mrem for a single verification would occur. This waiver requires supervisory approval and documentation.

This KA is met because the applicant must evaluate a potential exposure hazard and determine which requirement applies to that potential exposure.

This is an analysis question because the applicant is required to calculate the potential exposure and then apply a limit recalled from memory to correctly answer the question.

Answer A Discussion

Incorrect. Plausible because IV in a high radiation could potentially exceed the 10 mrem guidance for a single exposure. However, IV cannot be waived simply because the component is in a High Radiation Area.

Answer B Discussion

Incorrect. Plausible if the applicant believes that independent verification can not be waived in areas with radiation levels above 100 MREM / hr.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Plausible if the applicant does not recall the guideline of 10 mrem for a single verification criteria or miscalculates the potential exposure.

Job Level	Cognitive Level	Question Type	Question Source
RO	Comprehension	BANK	MNS Bank Question ADMOMPN036

401-9 Comments RESPONSE

Per Chief Examiner's recommendation, replaced distractor 'A'. Changed distractor 'C' to state a reason instead of "under these conditions". Rearranged answers for psychometric balance (B to A, A to B, D to C, C to D) making 'C' the correct answer.

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

NSD 700 Verification Techniques page 9 (previously OMP 8-2 Verification Techniques) and Lesson Plan OP-MC-ADM-OMP objective 22 related to OMP 8-2. OMP 8-2 was deleted in April 2009 and the ADM-OMP Lesson Plan has not yet been revised to make the change to NSD 700. However, the applicants would have been responsible for the requirements of OMP 8-2 and those requirements did not change with NSD 700.

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1872	GEN2.3	2.3.14	Radiation Control <input type="checkbox"/> Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)

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2009 RO NRC Retake Examination QUESTION 72

C

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2009 RO NRC Retake Examination

QUESTION 73

B

QuestionBank #	KA_system	KA_number	KA_desc
1873	GEN2.3	2.3.7	Radiation Control Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)

CURRENT

A radiation worker is repairing a valve in a contaminated area, which has the following radiological characteristics:

- The worker's present exposure is 1938 MREM for the year
- The RWP states:
 - General area dose rate = 30 MREM/hr
 - Airborne contamination concentration = 10.0 DAC

The job will take 2 hours if the worker wears a full-face respirator. It will only take 1 hour if the worker does not wear the respirator.

If the RP Manager grants all applicable dose extensions, which ONE (1) of the following choices for completing this job would maintain the worker's exposure within the station administrative requirements?

- A. The worker should not wear the respirator.
The dose received wearing a respirator will exceed site annual personnel dose limits.
- B. The worker should not wear the respirator.
The calculated TEDE dose received will be less than if he does wear one.
- C. The worker must wear the respirator.
The calculated TEDE dose received will be less than if he does not wear one.
- D. The worker must wear the respirator.
He will exceed DAC limits.

45 DAY VERSION

A radiation worker is repairing a valve in a contaminated area, which has the following radiological characteristics:

- The worker's present exposure is 1938 MREM for the year
- The RWP states:
 - General area dose rate = 30 MREM/hr
 - Airborne contamination concentration = 10.0 DAC

The job will take 2 hours if the worker wears a full-face respirator. It will only take 1 hour if the worker does not wear the respirator.

If the RP Manager grants all applicable dose extensions, which ONE (1) of the following choices for completing this job would maintain the worker's exposure within the station administrative requirements?

- A. The worker should not wear the respirator.
The dose received wearing a respirator will exceed site annual personnel dose limits.
- B. The worker should not wear the respirator.
The calculated TEDE dose received will be less than if he does wear one.
- C. The worker should wear the respirator.
The calculated TEDE dose received will be less than if he does not wear one.
- D. The worker should wear the respirator.
He could exceed DAC limits.

401-9 Comments:

G2.3.7
D is not plausible as written.
D: Change to: "should" to "must" and "could" to "will"
RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 73

B

General Discussion

Radiation exposure comparison:

Without respirator DDE = 30 mrem/hr x 1 hr = 30 mrem

From airborne contamination: CEDE = 10 DAC 1 hr x 2.5 mrem/DAC-hr = 25 mrem TEDE = 30 + 25 = 55 mrem from job Total exposure for year = 1938 + 55 = 1993 mrem

With respirator

DDE = 30 mrem/hr x 2 hr = 60 mrem CEDE = 0 TEDE = 60 mrem

Total exposure for year = 1938 + 60 = 1998 mrem

(With respirator) (Without respirator)

TEDE = 60 mrem > 55 mrem = do not use a respirator

K/A is matched because the information given in the stem of the question would be provided on a room survey map. This information would then be used to comply with the associated RWP for the work being performed. This question represents the kind of evaluation which could be encountered in order to comply with the requirements on an RWP

This is a comprehension level question because the applicant must recall multiple pieces of information such as DAC hour conversion and Exposure limits. He must then perform a calculation and predict an outcome.

Answer A Discussion

Incorrect: the dose will not exceed the 2000 mrem limit based on calculation.

Plausible: If the candidate miscalculates the dose

Answer B Discussion

Correct answer

Answer C Discussion

Incorrect: The calculated exposure will be greater if you wear the respirator. Plausible: If the candidate incorrectly computes the exposure - this was the correct answer on a previous exam

Answer D Discussion

Incorrect: DAC limits are not direct ALARA controls.

Plausible: If the candidate does not understand the concept of derived airborne concentrations.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2008 NRC Q72 (Bank 211)

401-9 Comments RESPONSE

Per Chief Examiner's suggestion, in distractor 'D' changed 'should' to 'must' and 'could' to 'will'. HCF 11/05/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan Objective: HP Obj: 22 & 29
1. OP-MC-RAD-RP

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1873	GEN2.3	2.3.7	Radiation Control <input type="checkbox"/> Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)

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2009 RO NRC Retake Examination QUESTION 73

B

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2009 RO NRC Retake Examination

QUESTION 74

D

QuestionBank #	KA_system	KA_number	KA_desc
1874	GEN2.4	2.4.16	Emergency Procedures / Plan Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines. (CFR: 41.10 / 43.5 / 45.13)

CURRENT

With the following conditions on Unit 1:

- A Loss of Offsite Power (LOOP) has resulted in a Reactor Trip and Safety Injection
- All Rod Bottom Lights are LIT
- Train 'A' Reactor Trip breaker is CLOSED
- Both Unit 1 D/G's FAILED to start
- Pressurizer level 25%
- Subcooling is 5°F
- NC system pressure is 1865 PSIG and stable
- Total CA flow is 500 GPM

Which ONE (1) of the following correctly states which procedure will have the highest PRIORITY for the above conditions?

- A. AP-007 (Loss of Electrical Power)
- B. FR-S.1 (Response to Nuclear Power Generation/ATWS)
- C. ES-1.1 (SI Termination)
- D. ECA-0.0 (Loss of All AC Power)

45 DAY VERSION

With the following conditions on Unit 1:

- A Loss of Offsite Power (LOOP) has resulted in a Reactor Trip and Safety Injection
- All Rod Bottom Lights are LIT
- Train 'A' Reactor Trip breaker is CLOSED
- Both Unit 1 D/G's FAILED to start

Which ONE (1) of the following correctly states which procedure will have the highest PRIORITY for the above conditions?

- A. AP-007 (Loss of Electrical Power)
- B. FR-S.1 (Response to Nuclear Power Generation/ATWS)
- C. ES-0.0 (Rediagnosis)
- D. ECA-0.0 (Loss of All AC Power)

401-9 Comments:

G2.4.16
No comment at this time
RFA 10/29/09

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2009 RO NRC Retake Examination QUESTION 74

D

General Discussion

With the conditions given in the stem of this question, a loss of all AC has occurred. In addition, entry conditions into FRP S-1 are presented but the situation given would require the crew to enter ECA 0.0 instead of the FRP. All EP;s with the exception of the ECA 0.0 series are written assuming at least one train of AC power is available therefore ECA would take priority of the CSF Red path for sub criticality as well as the other EP's listed in the distracters.

KA is matched because the candidate must demonstrate an understanding of the implementation hierarchy of emergency, specifically the understanding that ECA 0.0 takes priority over all other procedures.

This question is analysis level because the candidate must first determine from given information that a loss of all AC has occurred. In addition, the determination of a red path for FRP S-1 is warranted. The candidate must then take this information and evaluate the correct procedure priority. This demonstrates an analysis and subsequent application of the results of that analysis.

Answer A Discussion

Incorrect: See explanation above. Plausible: AP/07 is implemented in E-0 for loss of electrical power scenarios but it will not take priority over ECA 0.0.

Answer B Discussion

Incorrect: See explanation above. Plausible: A valid red path is given and this is normally the highest priority procedure. If a loss of all AC was not in progress this would be the correct answer

Answer C Discussion

Incorrect: See explanation above. Plausible since SI termination criteria is met as specified in the stem of the question.

Answer D Discussion

Correct: See explanation above

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2006 NRC Q74 (Bank 680)

401-9 Comments RESPONSE

Considered SAT for submittal with no comments. No changes.

- Developed**
- OPT Approved**
- OPS Approved**
- NRC Approved**

Development References
References: 1Lesson Plan OP-MC-EP-ECA-0, rev. 15 page 11,13 OMP 4-3 Pg 6

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1874	GEN2.4	2.4.16	Emergency Procedures / Plan Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines. (CFR: 41.10 / 43.5 / 45.13)

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2009 RO NRC Retake Examination

QUESTION 74

D

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2009 RO NRC Retake Examination

QUESTION 75

C

QuestionBank #	KA_system	KA_number	KA_desc
1875	GEN2.4	2.4.46	Emergency Procedures / Plan Ability to verify that the alarms are consistent with the plant conditions. (CFR: 41.10 / 43.5 / 45.3 / 45.12)

CURRENT

A Reactor Trip and Safety Injection have occurred on Unit 1 due to a Loss of Coolant Accident (LOCA). The following conditions exist:

- Containment pressure is 10 PSIG
- All NC pumps have been secured
- NC system subcooling is -50°F
- CETs indicate 750°F
- Reactor Vessel Lower Range Level is currently 32%

Which ONE (1) of the following correctly completes the statement below?

The Critical Safety Function status for Containment is (1) and the status of Core Cooling is (2).

- A. (1) ORANGE
(2) ORANGE
- B. (1) RED
(2) ORANGE
- C. (1) ORANGE
(2) RED
- D. (1) RED
(2) RED

45 DAY VERSION

A Reactor Trip and Safety Injection have occurred on Unit 1 due to a Loss of Coolant Accident (LOCA). The following conditions exist:

- Containment pressure is 10 PSIG
- All NC pumps have been secured
- NC system subcooling is -50°F
- CETs indicate 750°F
- Reactor Vessel Lower Range Level is currently 32%

The Critical Safety Function status for Containment is (1) and the status of Core Cooling is (2).

Which ONE (1) of the following correctly completes the statement above?

- A. (1) ORANGE
(2) ORANGE
- B. (1) RED
(2) ORANGE
- C. (1) ORANGE
(2) RED
- D. (1) RED
(2) RED

401-9 Comments:

G2.4.46

Is it fair to ask this question without a reference? If you allow a reference, will it become a direct look up (DLU).

Please re-evaluate

RFA 10/29/09

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2009 RO NRC Retake Examination

QUESTION 75

C

General Discussion

With containment pressure greater than 3 PSIG but less than 15 PSIG Containment CSF will be Orange.

With no NC pumps running, subcooling less than 0°F, CETs greater than 700°F, and Rx Vessel lower range level less than 39%, the Core Cooling CSF will be RED.

This KA is met because the applicant must analyze a given set of conditions and determine the status of CSFST indications (alarms). This requires a knowledge of emergency procedures (F-0) and the ability to determine applicability.

This question is comprehension level because the applicant must associate multiple pieces of information (some given and some recalled from memory) to determine the correct answer. The applicant must recall all setpoint for the Core Cooling and Subcriticality Safety Functions and apply the given conditions to determine the status of those two Safety Functions.

Answer A Discussion

Incorrect. Part 1 correct. Part 2 is plausible if the applicant does not recall the setpoint for CETs or Reactor Vessel Lower Range Level.

Answer B Discussion

Incorrect. Part 1 is plausible as there are procedure actions relative to the Containment Spray system which must be performed when containment pressure reaches 10 psig. Part 2 plausible if applicant does not recall CET or RV level setpoints.

Answer C Discussion

CORRECT.

Answer D Discussion

Incorrect. Part 2 correct. Part 1 is plausible as there are procedure actions relative to the Containment Spray system which must be performed when containment pressure reaches 10 psig.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

401-9 Comments RESPONSE

This question is asking entry conditions for the FR procedures and is considered RO level knowledge. Will discuss further with Chief Examiner during on-site review.
HCF 11/05/09

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

F-O Critical Safety Function Status Trees

Student References Provided

QuestionBank #	KA_system	KA_number	KA_desc
1875	GEN2.4	2.4.46	Emergency Procedures / Plan Ability to verify that the alarms are consistent with the plant conditions. (CFR: 41.10 / 43.5 / 45.3 / 45.12)