

DRAFT

U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information

Name:

Date:

Facility/Unit: CATAWBA

Region: I II III IV

Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

Applicant's Signature

Results

Examination Value _____ Points

Applicant's Score _____ Points

Applicant's Grade _____ Percent

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2008 SRO NRC Examination

QUESTION 1 DRAFT

D

QuestionBank #	KA_system	KA_number
507	EPE007	EK2.03

KA_desc
Knowledge of the interrelations between a reactor trip and the following: (CFR 41.7 / 45.7) <input type="checkbox"/> Reactor trip status panel

Unit 1 is at 100% reactor power.

Four hours ago:

- PZR Level Select Switch was in the 3-2 position
- PZR level channel 1 failed HIGH
- All actions required by Technical Specifications were completed to allow continued unit operation.

Following the receipt of several annunciators, the following items are noted:

- 1EDC has lost power
- 1FO-1, B/6 (PZR Hi Level RX Trip) is LIT and RED
- DRPI indicates all control rods above insertion limits

Which one of the following describes:

1. The current condition of the plant and
2. The correct operator action to take for the above evolution?

- A. 1. Anticipated Transient Without Scram (ATWS)
 2. Manually trip the reactor
- B. 1. Anticipated Transient Without Scram (ATWS)
 2. Perform a shutdown per OP/1/A/6100/003 (Controlling Procedure for Unit Operation)
- C. 1. Reactor Protection System (RPS) failure
 2. Manually trip the reactor
- D. 1. Reactor Protection System (RPS) failure
 2. Perform a shutdown per OP/1/A/6100/003 (Controlling Procedure for Unit Operation)

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QUESTION 1

D

General Discussion

OMP 1-7 General Statements of Philosophy:

An ATWS (Anticipated Transient Without Scram) is defined in 10CFR50.62 as an anticipated operational occurrence followed by the failure of the reactor trip portion of the protective system. To have an ATWS there must be a transient followed by a failure of the reactor trip breakers. Instrument failures, by themselves, are not necessarily transients. For example, if one channel of Pressurizer Pressure was out of service for preventive maintenance (bistable in tripped condition) and another Pressurizer Pressure channel failed (not the controlling channel), a reactor trip signal would be generated. If the reactor failed to trip, this would be a failure of the reactor trip breakers and the automatic trip features of the reactor protection system and not an ATWS event. (PPRB OPS-9283)

Also, OTDT runback would occur if rods are in AUTOMATIC

Answer A Discussion

Plausible: An invalid reactor trip is present as defined by OMP 1-7. To manually trip the reactor would be correct if it was a valid reactor trip.

Answer B Discussion

Plausible: An invalid reactor trip is present as defined by OMP 1-7 This is not an ATWS. The shutdown would be correct due to being in TS required shutdown.

Answer C Discussion

Plausible: This is a failure of the RPS system per OMP 1-7 To manually trip the reactor would be correct if it was a valid reactor trip.

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2006 NRC Q1 (Bank 607)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

EPINTRO13
OMP 1-7
TS 3.3.1

Student References Provided

QuestionBank #	KA_system	KA_number
507	EPE007	EK2.03

KA_desc

Knowledge of the interrelations between a reactor trip and the following: (CFR 41.7 / 45.7) Reactor trip status panel

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QUESTION 2

D

QuestionBank #	KA_system	KA_number
508	EPE009	EA2.10

KA_desc

Ability to determine or interpret the following as they apply to a small break LOCA: (CFR 43.5 / 45.13) Airborne activity

Unit 1 was in Mode 3 at full temperature and pressure with all control and shutdown banks inserted. Operators note the following:

- 1RAD-1, B/3 "1EMF41 AUX BLDG VENT HI RAD" - LIT
- 1AD-13, A/1 "ND & NS ROOMS SUMP LEVEL EMERG HI" - LIT
- "SAFETY INJECTION ACTUATED" status light - LIT

Which one of the following states the correct procedure flowpath that will address this event?

- A. AP/1/A/5500/027 (Shutdown LOCA)
AP/1/A/5500/019 (Loss of Residual Heat Removal System)
- B. AP/1/A/5500/027 (Shutdown LOCA)
AP/1/A/5500/010 (Reactor Coolant Leak)
- C. EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)
EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant)
EP/1/A/5000/ES-1.2 (Post LOCA Cooldown and Depressurization)
- D. EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)
EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant)
EP/1/A/5000/ECA-1.2 (LOCA Outside Containment)

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QUESTION 2

D

General Discussion

The EMF in alarm is the key to a LOCA outside containment with the sump level providing confirmation. Choices B and C are for LOCAs IN containment. Choices A and B are for shutdown conditions as stated in AP/27 which do not apply to this situation based on the stem.

Answer A Discussion

He may interpret "shutdown" in the title as Mode 3. This is a common point of confusion. When AP/27 is used, it does transition for this situation to AP/19

Answer B Discussion

There is a transition to AP/10, however he should realize it's a LOCA outside containment based on EMF-41 and ND/NS sump room.

Answer C Discussion

This is a valid EP flowpath for a leak in the NCS. But not for a LOCA outside containment.

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
OP/1/B/6100/010X AP/1/A/5500/027 EP/1/A/5000/E-1 EP/1/A/5000/ECA-1.2

Student References Provided

QuestionBank #	KA_system	KA_number
508	EPE009	EA2.10

KA_desc
Ability to determine or interpret the following as they apply to a small break LOCA: (CFR 43.5 / 45.13) Airborne activity
.....

QuestionBank #	KA_system	KA_number
509	EPE011	2.4.30

KA_desc
EPE011 GENERIC Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

Given the following events:

- A Large Break LOCA has occurred on Unit 2
- All equipment functioned as designed
- The OSM has declared an Alert
- A signed Emergency Notification Sheet has been handed to you for transmittal

Which of the following is a complete list of agencies required to be contacted within 15 minutes of the declaration of the Alert?

- A. State and county warning points
 - B. State warning points and NRC Operations Center
 - C. County warning points and NRC Operations Center
 - D. State and county warning points and the NRC Operations Center
-

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QUESTION 3

A

General Discussion

15 minute notifications do not include NRC, but are the state and county warning points.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2005 NRC Q75 (Bank 479)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
RP/0/A/5000/006A rev30 RP/0/A/5000/001 rev 18

Student References Provided

QuestionBank #	KA_system	KA_number
509	EPE011	2.4.30

KA_desc
EPE011 GENERIC Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

QuestionBank #	KA_system	KA_number
510	APE022	AK1.02

KA_desc
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) Relationship of charging flow to pressure differential between charging and RCS

Given the following initial conditions:

- 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in MANUAL
- 1NV-309 (Seal Water Injection Flow) in MANUAL
- pressurizer pressure is 2235 psig
- total seal water flow is 32 gpm
- charging line flow is 89 gpm

If pressurizer pressure is increased to 2300 psig, which one of the following sets of system parameter changes is correct?

- A. Charging line flow decreases and total seal water flow decreases
- B. Charging line flow decreases and total seal water flow remains the same
- C. Charging pump discharge header pressure increases and total seal water flow increases
- D. Charging pump discharge header pressure increases and total seal water flow remains the same

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QUESTION 4

A

General Discussion

Centrifugal pump laws require that the discharge header pressure increases and flow decreases as system pressure increases. Therefore charging line flow and total seal flow will decrease while charging line discharge pressure increases.

Answer A Discussion

CORRECT

Answer B Discussion

Incorrect: total seal flow decreases because INV-309 is in manual.

Answer C Discussion

Incorrect: total seal flow decreases. May think higher discharge pressure = more seal flow.

Answer D Discussion

Incorrect: total seal water flow decreases because INV-309 is in manual.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2005 NRC Q6 (Bank 410)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
THFFF12 thru THFFF15

Student References Provided

QuestionBank #	KA_system	KA_number
510	APE022	AK1.02

KA_desc
 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) Relationship of charging flow to pressure differential between charging and RCS

QuestionBank #	KA_system	KA_number
511	APE025	2.4.30

KA_desc
APE025 GENERIC Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

Unit 1 was in Mode 5 preparing to enter Mode 6.

Given the following:

- Both trains of ND have been lost.
- The crew entered AP/1/A/5500/019 (Loss of Residual Heat Removal System) but actions to restore cooling have failed.
- The OSM has determined an immediate need to take an action per 10CFR50.54(X).

Per 10CFR50.54(x):

1. Is notification to the NRC Operations Center required prior to taking the action?
2. How many SROs (in total) are required to agree prior to taking the action?

- A. 1. Yes
 2. One

 - B. 1. Yes
 2. Two

 - C. 1. No
 2. One

 - D. 1. No
 2. Two
-

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QUESTION 5

C

General Discussion

50.72 "The licensee shall activate the Emergency Response Data System (ERDS)4 as soon as possible but not later than one hour after declaring an Emergency Class of alert, site area emergency, or general emergency".

OMP 1-7 3. The licensee shall notify the NRC Operations Center by ENS telephone of emergency circumstances requiring the licensee to take any protective action that departs from a license condition or technical specification as permitted by the preceding paragraphs. When time permits, the notification must be made before the protective action is taken; otherwise, the notification must be made as soon as possible thereafter. The Commission may require written statements from a licensee concerning its action. Also, the licensee should notify the Resident NRC Inspector as soon as practical.

Per 10cfr5054x, only one SRO is required to make the determination and take action per the CFR. OMP 1-7 says for situations not covered by procedure, 2 are required.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

OMP 1-7

Student References Provided

QuestionBank #	KA_system	KA_number
511	APE025	2.4.30

KA_desc

APE025 GENERIC Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. (CFR: 41.10 / 43.5 / 45.11)

QuestionBank #	KA_system	KA_number
512	APE026	AA2.03

KA_desc
Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: (CFR: 43.5 / 45.13) □ The valve lineups necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition

Unit 1 was operating at 100% with “A” Train KC in service. Given the following:

- An 86N relay actuated on 1ETB two minutes ago
- A major KC system piping leak has occurred in the Auxiliary Building non-essential header
- 1AD-10, A/1 “KC SURGE TANK A LO-LO LEVEL” - LIT
- 1AD-10, A/2 “KC SURGE TANK B LO-LO LEVEL” - LIT
- The crew has entered AP/1/A/5500/021 (Loss Of Component Cooling)

Assuming all automatic actions have occurred, which one of the following correctly lists the major KC headers that are currently being cooled?

- A. KC Train A essential header only
- B. KC Train A essential header and the Reactor Building non-essential header
- C. KC Train A essential header and KC Train B essential header
- D. KC Train A essential header, KC Train B essential header and the Reactor Building non-essential header

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QUESTION 6

A

General Discussion

An 86N locks out the essential bus, therefore, B train KC pumps are off and the B train header isolation valves will not close. The Reactor building header shares common piping with the AB non-ess header. Both non-essential headers are isolated based on low KC surge tank levels due to the piping rupture.

Answer A Discussion

Answer B Discussion

If student thinks that the Rx Building header is not isolated since the leak is on the AB header. Although its diff valves for purposes of leak isolation they are identical.

Answer C Discussion

If student thinks the D/G re-energizes 1ETB

Answer D Discussion

Both B and C above for psychometric balance.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP/1/A/5500/021
PSSKC

Student References Provided

QuestionBank #	KA_system	KA_number
512	APE026	AA2.03

KA_desc

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: (CFR: 43.5 / 45.13) The valve lineup necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition

QuestionBank #	KA_system	KA_number
513	APE027	AA1.04

KA_desc
 Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: (CFR 41.7 / 45.5 / 45.6) Pressure recovery, using emergency-only heaters

Given the following:

- The SSF has been manned due to a fire in the cable spreading room.
- During the course of SSF operations a head vent stuck in the open position for a short period of time and then reclosed.
- You have been directed to increase NC pressure using heaters.

1. Why is pressure recovery slower from the SSF than from the Control Room?
2. How are the heaters available from the SSF secured should Pzr level drop below 17%?

- A.
 1. Only a portion of the D heaters are available from the SSF
 2. Automatically
- B.
 1. Only a portion of the D heaters are available from the SSF
 2. Manually
- C.
 1. Only A and B heaters are available from the SSF
 2. Automatically
- D.
 1. Only A and B heaters are available from the SSF
 2. Manually

General Discussion

Only a portion of D heaters are available from the SSF. The OP for SSF operations has numerous cautions about having to manually secure those heaters should level drop below 17%. A&B heaters are available from the ASP.

Answer A Discussion

first part is correct.

Answer B Discussion

CORRECT

Answer C Discussion

The A and B heaters would automatically secure but are available from the ASP not the SSF

Answer D Discussion

second part is correct

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

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

Development References
OP/0/B/6100/013 PSILE

Student References Provided

QuestionBank #	KA_system	KA_number
513	APE027	AA1.04

KA_desc
 Ability to operate and / or monitor the following as they apply to the Pressurizer Pressure Control Malfunctions: (CFR 41.7 / 45.5 / 45.6) Pressure recovery, using emergency-only heaters

QuestionBank #	KA_system	KA_number
514	EPE029	2.4.34

KA_desc
EPE029 GENERIC Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)

Which one of the following is a complete list of breakers directed to be opened per EP/1/A/5000/FR-S.1 (Response to Nuclear Power Generation/ATWS) to trip the reactor locally?

1. Reactor Trip Breakers RTA and RTB
 2. Reactor Trip Bypass Breakers BYA and BYB
 3. CRD/MG "Motor" Breakers
 4. CRD/MG "Generator" Breakers
- A. 1
- B. 1 and 2
- C. 1, 2 and 3
- D. 1, 2, 3, and 4
-

General Discussion

Normally the OSM will directed the non affected Units BOP to go open these breakers to minimize the time the Reactor stays critical. RO's know it takes only opening one breaker to trip the reactor.

Answer A Discussion

Incorrect: EP/1/A/500/FR-S.1 requires opening all the breakers. needs to be open to trip the reactor. Plausible: Students knows only one breaker

Answer B Discussion

Incorrect: EP/1/A/500/FR-S.1 requires opening all the breakers. verify that Reactor Trip breakers and Reactor Trip Bypass Breakers are opened. Plausible: Immediate actions of EP/1/A/5000/E-0

Answer C Discussion

Incorrect: EP/1/A/500/FR-S.1 requires opening all the breakers. Breakers doesn't trip the Reactor then opening the MG set breakers will cause the rods to fall. Plausible: If opening the Reactor Trip and Bypass

Answer D Discussion

Correct

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
FR-S.1

Student References Provided

QuestionBank #	KA_system	KA_number
514	EPE029	2.4.34

KA_desc
 EPE029 GENERIC Knowledge of RO tasks performed outside the main control room during an emergency and the resultant operational effects. (CFR: 41.10 / 43.5 / 45.13)

QuestionBank #	KA_system	KA_number
515	EPE038	EK1.02

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the SGTR: (CFR 41.8 / 41.10 / 45.3) Leak rate vs. pressure drop

Given the following:

- Unit 1 and 2 are operating at 100%
- One single steam generator tube fully shears on each unit
- The crews are responding per EP/1(2)/A/5000/E-3 (Steam Generator Tube Rupture), preparing to perform the initial reactor coolant system cooldown to the required core exit thermocouple temperature using steam dumps.

Based on the differences between Unit 1 and Unit 2 steam generator design:

1. Which unit would have a lower primary system equilibrium pressure?
2. Which unit will have a faster cooldown rate?

(Assume identical cores and steam dump performance.)

- A. Unit 1 would have a lower equilibrium pressure and Unit 1 would have a faster cooldown rate.
- B. Unit 1 would have a lower equilibrium pressure and Unit 2 would have a faster cooldown rate.
- C. Unit 2 would have a lower equilibrium pressure and Unit 1 would have a faster cooldown rate.
- D. Unit 2 would have a lower equilibrium pressure and Unit 2 would have a faster cooldown rate.

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QUESTION 9

C

General Discussion

Unit 1 has smaller tubes and larger surface area, therefore the leakage would be less on Unit 1 causing Unit 2 to have a larger pressure drop to equilibrium and assuming dumps are fully opened for the initial NC cooldown, Unit 1 would cooldown faster.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2005 NRC Q69 (Bank 473)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
STMSG10

Student References Provided

QuestionBank #	KA_system	KA_number
515	EPE038	EK1.02

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to the SGTR: (CFR 41.8 / 41.10 / 45.3) Leak rate vs. pressure drop

QuestionBank #	KA_system	KA_number
516	APE057	AA2.13

KA_desc
Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: (CFR: 43.5 / 45.13) VCT level and pressure indicators and recorders

Unit 1 is operating at 100%. 1ERPA is lost. What effect does this have on VCT auto makeup capability and VCT level indication in the control room?

- | | <u>Auto Makeup</u> | <u>Level Indication</u> |
|----|--------------------|-------------------------|
| A. | Available | Available |
| B. | Unavailable | Available |
| C. | Available | Unavailable |
| D. | Unavailable | Unavailable |

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QUESTION 10

B

General Discussion

Vital has no effect on level indication. Lost of ERPA will cause the Rx M/U pumps to not start in auto or manual. This makes auto makeup be lost.

Answer A Discussion

Incorrect for makeup but correct for indication

Answer B Discussion

CORRECT

Answer C Discussion

Incorrect for makeup and for indication.

Answer D Discussion

Correct for makeup but incorrect for indication.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP/1/A/5500/029

Student References Provided

QuestionBank #	KA_system	KA_number
516	APE057	AA2.13

KA_desc

Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: (CFR: 43.5 / 45.13) VCT level and pressure indicators and recorders

QuestionBank #	KA_system	KA_number
517	APE058	AA1.02

KA_desc
Ability to operate and / or monitor the following as they apply to the Loss of DC Power: (CFR 41.7 / 45.5 / 45.6) <input type="checkbox"/> Static inverter dc input breaker, frequency meter, ac output breaker, and ground fault detector

Given the following:

- 1ERPD has been de-energized due to a blown fuse on inverter 1EID.
- The crew has implemented AP/1/A/5500/029 (Loss of Vital or Aux Control Power).
- The fuse has been replaced and the CRS wishes to re-energize 1ERPD from 1EID.

Which one of the following correctly states the minimum acceptable wait time prior to inverter restart and the sequence for operation of inverter 1EID DC input breaker and AC output breaker?

- A.
 1. 5 seconds
 2. Close the DC input breaker and then close the AC output breaker
 - B.
 1. 5 seconds
 2. Close the AC output breaker and then close the DC input breaker
 - C.
 1. 60 seconds
 2. Close the DC input breaker and then close the AC output breaker
 - D.
 1. 60 seconds
 2. Close the AC output breaker and then close the DC input breaker
-

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QUESTION 11

C

General Discussion

Per OP L&P 60 sec wait must occur. 5 seconds is the required precharge time.

Answer A Discussion

Time is incorrect.

Answer B Discussion

Both time and order are incorrect.

Answer C Discussion

correct

Answer D Discussion

The order of the AC and DC breakers are reversed

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
EPL AP/1/A/5500/029 OP/1/A/6350/008

Student References Provided

QuestionBank #	KA_system	KA_number
517	APE058	AA1.02

KA_desc
 Ability to operate and / or monitor the following as they apply to the Loss of DC Power: (CFR 41.7 / 45.5 / 45.6) Static inverter dc input breaker, frequency meter, ac output breaker, and ground fault detector

QuestionBank #	KA_system	KA_number
518	APE062	AK3.03

KA_desc
Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: (CFR 41.4, 41.8 / 45.7) □ Guidance actions contained in EOP for Loss of nuclear service water

Both units were at 100% with 2A RN Pump in service when the following annunciators were received:

- 1AD-12, E/2 "RN PIT A SWAP TO SNSWP" - LIT
- 2AD-12, E/2 "RN PIT A SWAP TO SNSWP" - LIT
- 1AD-12, B/1 "RN PUMP INTAKE PIT A LEVEL - LO" - LIT
- 2AD-12, B/1 "RN PUMP INTAKE PIT A LEVEL - LO" - LIT

During the recovery 2RN-48B (RN Supply X-Over Isol) was re-opened, however 1RN-48B (RN Supply X-Over Isol) could not be re-opened.

What is the minimum time the crew must wait following receipt of the above annunciators prior to securing any RN Pumps and what is the minimum number of RN Pump(s) required to ensure flow to both essential train headers on both units?

- A. 2 minutes; 1 pump
- B. 2 minutes; 2 pumps
- C. 5 minutes; 1 pump
- D. 5 minutes; 2 pumps

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QUESTION 12

A

General Discussion

AP/20 states that valves and pumps cannot be manipulated for 2 minutes following the autostart on pit level. (5 minutes is the time for the YV swap.) Only one of the B train crossovers is required to ensure flow to all essential headers, however, both close on the low pit level and student must remember that only one is required. Since normal alignment is all crossovers open, student may assume they are both required open to get flow to the opposite unit header.

Answer A Discussion

CORRECT

Answer B Discussion

Correct time, wrong number of pumps

Answer C Discussion

Wrong time, correct number of pumps

Answer D Discussion

Both incorrect - for psychometric balance

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP/20
RN lesson

Student References Provided

QuestionBank #	KA_system	KA_number
518	APE062	AK3.03

KA_desc

Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: (CFR 41.4, 41.8 / 45.7) Guidance actions contained in EOP for Loss of nuclear service water

QuestionBank #	KA_system	KA_number
519	APE065	AK3.03

KA_desc
Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: (CFR 41.5,41.10 / 45.6 / 45.13) Knowing effects on plant operation of isolating certain equipment from instrument air

Given the following:

- One RL turnaround valve is manually pinned in place for maintenance
- The crew has entered AP/0/A/5500/022 (Loss of Instrument Air)
- Operators have determined that the leak can be isolated but doing so will result in all RL turnaround valves losing VI.
- The CRS has directed that the leak be isolated.

Which one of the following correctly states the effect that this will have on the RL turnaround valves and the equipment cooled by RL.

- A. The unpinned RL turnaround valves will fail open resulting in more flow to the components supplied by RL.
- B. The unpinned RL turnaround valves will fail closed resulting in more flow to the components supplied by RL.
- C. The unpinned RL turnaround valves will fail open resulting in less flow to the components supplied by RL.
- D. The unpinned RL turnaround valves will fail closed resulting in less flow to the components supplied by RL.

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QUESTION 13

B

General Discussion

The RL turnaround valves basically act as a false load to maintain header pressure. The valves fail closed which cause header pressure to increase and forces more flow through the other components. This is counterintuitive.

Answer A Discussion

the valves fail closed. But logic would say that valves failing open would result in > flow but not the case due to system design.

Answer B Discussion

CORRECT

Answer C Discussion

True if the valves DID fail open

Answer D Discussion

fail in right direction but the effect is reversed.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
RL

Student References Provided

QuestionBank #	KA_system	KA_number
519	APE065	AK3.03

KA_desc
 Knowledge of the reasons for the following responses as they apply to the Loss of Instrument Air: (CFR 41.5,41.10 / 45.6 / 45.13) Knowing effects on plant operation of isolating certain equipment from instrument air

QuestionBank #	KA_system	KA_number
520	APE077	AA1.01

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

Given the following:

- Unit 1 is at 100% power with power factor at 0.99 lagging.
- Operators are controlling power factor in manual due to the auto voltage regulator not controlling properly.
- A major grid disturbance causes power factor to increase to slightly leading.

1. Which button on the voltage regulator is operated to bring power factor back to its original value?
2. What part of the generator is susceptible to overheating should power factor be erroneously adjusted to 0.8 lagging?

Reference provided

- A.
 1. The "LOWER" button
 2. The generator armature core end
- B.
 1. The "RAISE" button
 2. The generator armature core end
- C.
 1. The "LOWER" button
 2. The generator field
- D.
 1. The "RAISE" button
 2. The generator field

General Discussion

The RAISE button will cause power factor to decrease from a leading value to a lagging value. If the generator voltage is adjusted to severely lagging (.8) then it will be past the AB line on the Generator capability curve and field heating is a concern.

Answer A Discussion

.Both parts wrong , psychometric balance.

Answer B Discussion

Wwrong gneerator component. This would be if PF was severely LEADING.

Answer C Discussion

LOWER will cause PF to go more lagging but lower seems logical , Correct generator aea

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

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

Development References
Generator Capability Curve (DataBook Curve 43) RL

Student References Provided
Databook Figure 43 (Generator Capability Curve)

QuestionBank #	KA_system	KA_number
520	APE077	AA1.01

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

QuestionBank #	KA_system	KA_number
521	WE04	EK2.2

KA_desc

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.

Unit 1 was operating at 100%. Given the following events and conditions:

- 0200 – reactor tripped due to a LOCA outside containment
- 0210 – crew enters ECA-1.2, (LOCA Outside Containment)
- 0220 – crew enters ECA-1.1, (Loss of Emergency Coolant Recirc)
- 0240 – The crew is at the step in ECA-1.1 to determine NC subcooling
- Current conditions:
 - NCS pressure is 1100 psig
 - 1B NC pump running
 - 1A, 1C, and 1D NC pumps secured
 - Reactor Vessel D/P is 20%
 - 1 NI pump running, indicating 220 gpm
 - 1 NV pump running, indicating 385 gpm
 - Both ND pumps off
 - No NS pumps running
 - Subcooling is 35°F

Which one of the following statements correctly describes the minimum required flow and which pump can be secured?

Reference provided

- A. 210 gpm, stop the running NV pump.
- B. 210 gpm, stop the running NI pump.
- C. 410 gpm, stop the running NI pump.
- D. 410 gpm, neither pump may be secured at this time.

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QUESTION 15

D

General Discussion

Bank Question: 912.1
 Time after trip is 40 minutes, graph starts at 10 minutes, flow required is 408 gpm

Answer A Discussion

Incorrect: required flow is 408 gpm
 Plausible: candidate misses the fact that the graph starts at 10 minutes; this is the 50 minute number

Answer B Discussion

Correct: required flow is 408 gpm, the NV pump is providing 410 gpm, and the NI pump may be stopped.

Answer C Discussion

Incorrect: required flow is 408 gpm
 Plausible: candidate uses 30 minutes to determine required flow (time since diagnosis of LOCA outside containment)

Answer D Discussion

Incorrect: required flow is 408 gpm
 Plausible: candidate uses 20 minutes to determine required flow (time since procedure entry)

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2004 NRC Q26 (Bank 326)

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

Development References
Lesson Plan Objective: EP-EP2 SEQ 29 References: 1. ECA-1.1 step 19 and Encl 5 - PROVIDED

Student References Provided
EP/1/A/5000/ECA-1.1 (Step 19) EP/1/A/5000/ECA-1.1 (Enclosure 5)

QuestionBank #	KA_system	KA_number
521	WE04	EK2.2

KA_desc
 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.

QuestionBank #	KA_system	KA_number
522	WE05	EK3.1

KA_desc

Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink) (CFR: 41.5 / 41.10, 45.6, 45.13) □ Facility operating characteristics during transient conditions, including □ coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

A feedwater transient resulted in a reactor trip and the operating crew entered EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) when all Auxiliary Feedwater flow was lost. Given the following:

- S/G 1A wide range level – 31%
- S/G 1B wide range level – 20%
- S/G 1C wide range level – 23%
- S/G 1D wide range level – 28%
- The BOP has just secured all the NC pumps
- The OATC notes NC system pressure is increasing

1. Why have NC pumps been secured?
2. Why is NCS pressure increasing?

- A. 1. To begin NCS bleed and feed
 2. Due to NC temperature increase
- B. 1. To minimize heat input
 2. Due to letdown being secured
- C. 1. To begin NCS bleed and feed
 2. Due to letdown being secured
- D. 1. To minimize heat input
 2. Due to NC temperature increase
-

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QUESTION 16

D

General Discussion

There are 2 times NC pumps are secured in H1. First after CA cannot be reinitiated, and second is prior to commencing feed and bleed. S/G wide range levels are above the F/B criteria (3<24% WR to establish) unless ACC conditoions (36%). NCPs are secured to minimize heat input causing the water in the S/G to last longer. Pressure inceases due to the temperature increase prior to the establishment of natural circulation.

Answer A Discussion

F/B criteria are not met but would be for ACC numbers (correct part 2)

Answer B Discussion

Part 1 is correct, part 2 is not

Answer C Discussion

both part incorrect - psychometric baloance

Answer D Discussion

Correct

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
FR-h.1 and basis E-1 and basis

Student References Provided

QuestionBank #	KA_system	KA_number
522	WE05	EK3.1

KA_desc
 Knowledge of the reasons for the following responses as they apply to the (Loss of Secondary Heat Sink)
 (CFR: 41.5 / 41.10, 45.6, 45.13) □ Facility operating characteristics during transient conditions, including □ coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics.

QuestionBank #	KA_system	KA_number
523	WE11	EK2.1

KA_desc
Knowledge of the interrelations between the (Loss of Emergency Coolant Recirculation) 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.

The crew implemented EP/1/A/5000/ECA-1.2 (LOCA Outside Containment), determined the leak can not be isolated and transitioned to EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirculation). Given the following:

- FWST level is 55%
- Subcooling is +7°F.

What actions, if any, are taken per EP/1/A/5000/ECA-1.1 to ensure the NV pumps maintain adequate suction until cold leg recirculation capability is restored?

- A. Terminate safety injection and establish normal charging from the VCT.
- B. Remove power from 1NI-184B (ND Pump 1B Cont Sump Suct) and 1NI-185A (ND Pump 1A Cont Sump Suct)
- C. Use "DEFEAT" buttons used for "C-LEG RECIR TO CONT SUMP SWAP TRN A" and "C-LEG RECIR FWST TO CONT SUMP SWAP TRN B"
- D. None, a swap to the containment sump is blocked when sump level is less than 3.3 feet

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QUESTION 17

C

General Discussion

With FWST level at 55%, an attempt to swap hs not been made (37%).

Answer A Discussion

This can be done if Subcooling is > 50 degrees. Normal S/I termination criteria is subcooling >0 degrees. Swap to VCT is done in this procedure in that case.

Answer B Discussion

This is an action that could be done to prevent these valves from opening and is done when it is trying to open them manually.

Answer C Discussion

CORRECT

Answer D Discussion

The procedure mentions sump levels being both > 2.5 feet and > 3.3 feet in several locations. The basis is to check for adequate suction source, but there are no actual interlocks to prevent the swapover at 37%.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References	Student References Provided
ECA 1.1	

QuestionBank #	KA_system	KA_number
523	WE11	EK2.1

KA_desc
 Knowledge of the interrelations between the (Loss of Emergency Coolant Recirculation) 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.

QuestionBank #	KA_system	KA_number
524	WE12	EK1.3

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the (Uncontrolled Depressurization of all Steam Generators)
(CFR: 41.8 / 41.10 / 45.3) □ Annunciators and conditions indicating signals, and remedial actions associated with the (Uncontrolled Depressurization of all Steam Generators).

The crew entered EP/1/A/5000/ECA-2.1 (Uncontrolled Depressurization of All Steam Generators) following a unit trip. Given the following:

- Attempts to close any MSIV using its individual valve control board pushbutton have failed.
- Safety Injection has not been reset.

1. What additional action is taken per this procedure to attempt to close any MSIV?
2. If an MSIV can be closed, what plant parameter is monitored to determine when this procedure can be exited?

- A.
 - 1. Maintenance is dispatched to isolate air to the MSIVs.
 - 2. NC loop T-hots

- B.
 - 1. Both trains of Main Steam Isolation are initiated.
 - 2. NC loop T-hots

- C.
 - 1. Maintenance is dispatched to isolate air to the MSIVs.
 - 2. S/G pressure

- D.
 - 1. Both trains of Main Steam Isolation are initiated.
 - 2. S/G pressure

General Discussion

To exit, one steam generator pressure must be increasing and S/I termination must not be in progress per ECA 2-1. NC Thots are monitored for other reasons in this procedure and they will increase once the MSIV is closed, but Enclosure one specifies S/G Pressure. SM ISOL pushbuttons are depressed due to failed auto actions most likely during E-0 in this scenario, but ECA-2.1 does not redo this action. It sends MAINT to isolate VI to the valves locally.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
EP/1/A/5000/ECA-2.1

Student References Provided

QuestionBank #	KA_system	KA_number
524	WE12	EK1.3

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to the (Uncontrolled Depressurization of all Steam Generators)
 (CFR: 41.8 / 41.10 / 45.3) □ Annunciators and conditions indicating signals, and remedial actions associated with the (Uncontrolled Depressurization of all Steam Generators).

QuestionBank #	KA_system	KA_number
525	APE001	AA1.06

KA_desc
Ability to operate and / or monitor the following as they apply to the Continuous Rod Withdrawal : (CFR 41.7 / 45.5 / 45.6) Rod transfer switches

Given the following events and conditions on Unit 1:

- NC system is at full temperature and pressure.
- "A" Shutdown Bank control rods are fully withdrawn.
- CRD BANK SELECT switch is in the "SBB" position.
- The OATC is withdrawing "B" Shutdown Bank control rods with the current bank position at 64 steps withdrawn.
- The OATC releases the ROD MOTION switch but "B" Shutdown Bank control rods continue to withdraw.

1. What is the current plant Mode of Operation?
2. Which of the following describes the first required procedural action(s) for this situation?
 - A.
 1. Mode 2
 2. Immediately trip the reactor.
 - B.
 1. Mode 3
 2. Immediately trip the reactor.
 - C.
 1. Mode 2
 2. Immediately place CRD BANK SELECT switch IN MANUAL; if rods continue to move then trip the reactor.
 - D.
 1. Mode 3
 2. Immediately place CRD BANK SELECT switch IN MANUAL; if rods continue to move then trip the reactor.

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QUESTION 19

D

General Discussion

Per IRE lesson: '3. Allows individual banks to be moved in bank select positions. No prescribed sequencing exists and Bank Overlap is defeated.' Immed action for AP/15.

Mode 2 occurs when the first CONTROL BANK begins withdrawal. Plant is currently in Mode 3

Answer A Discussion

wrong mode, wrong action

Answer B Discussion

wrong action , right mode

Answer C Discussion

right action, wrong mode

Answer D Discussion

CORRECT

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP/15 IRE

Student References Provided

QuestionBank #	KA_system	KA_number
525	APE001	AA1.06

KA_desc
Ability to operate and / or monitor the following as they apply to the Continuous Rod Withdrawal : (CFR 41.7 / 45.5 / 45.6) Rod transfer switches

QuestionBank #	KA_system	KA_number
526	APE005	2.4.6

KA_desc
APE005 GENERIC Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

Unit 1 was operating at 100% power with Control Rod Bank D at 216 steps withdrawn on DRPI when an OTDT runback occurred for approximately 30 seconds and cleared.

When conditions stabilized, the following indications were noted:

- Control Rod Bank D demand counters are indicating 190 steps.
- Control Rod Bank D rod D4 indicates 216 steps withdrawn on DRPI.
- All other Control Rod Bank D rods indicate 188 steps withdrawn on DRPI.

1. What is the first immediate action of the Abnormal Procedure that will address this issue?
2. What are the modes of applicability for the corresponding Technical Specification?
 - A.
 1. Verify only one rod – MISALIGNED.
 2. MODE 1, MODE 2 with $k_{eff} \geq 1.0$
 - B.
 1. Verify only one rod – MISALIGNED.
 2. MODE 1, MODE 2
 - C.
 1. Ensure “CRD BANK SELECT” switch – IN MANUAL.
 2. MODE 1, MODE 2 with $k_{eff} \geq 1.0$
 - D.
 1. Ensure “CRD BANK SELECT” switch – IN MANUAL.
 2. MODE 1, MODE 2

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QUESTION 20

B

General Discussion

One CR is misaligned by >24 asteps. And AP/14 would be appropriate for this situation. CRD bank select to manual is not an immedaite action but is the next action of this AP. It IS an immediate action of AP/15 for continuous rod movement. Tech spec 3.1.4 applied for Rod Group alignment Limits. 3.1.6 does not apply because the control rods are above insertion limits.

Answer A Discussion

wrong TS applicability

Answer B Discussion

CORRECT

Answer C Discussion

Both wrong (for psychometric balance.)

Answer D Discussion

Wrong action

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

TS 3.1.6
AP/14
AP/15
TS3.1.4

Student References Provided

QuestionBank #	KA_system	KA_number
526	APE005	2.4.6

KA_desc

APE005 GENERIC Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

QuestionBank #	KA_system	KA_number
527	APE024	AK1.04

KA_desc
Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: (CFR 41.8 / 41.10 / 45.3) Low temperature limits for born concentration

Given the following:

- Unit 1 is in Mode 5
- BAT temperature is 60° F.
- FWST temperature is 70° F.

Assuming any required pumps are operable, which one of the following correctly states a combination of equipment which will satisfy the requirements of SLC 16.9-7 Boration System Flowpaths – Shutdown?

- A. BAT to NV Pump
- B. FWST to NI Pump via 2 cold leg lines
- C. FWST to NV Pump
- D. FWST to ND Pump via 2 cold leg lines

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QUESTION 21

C

General Discussion

Bat is inoperable due to <65 deg F. FWST is operable.
 NI Pump requires 4 flow paths not 2
 ND can only be used in Mode 6.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
TS 3.9.4 SLC 16.9-7 SLC 16.9-11

Student References Provided

QuestionBank #	KA_system	KA_number
527	APE024	AK1.04

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: (CFR 41.8 / 41.10 / 45.3) Low temperature limits for born concentration

QuestionBank #	KA_system	KA_number
528	APE033	AK1.01

KA_desc
Knowledge of the operational implications of the following concepts as they apply to Loss of Intermediate Range Nuclear Instrumentation:
CFR 41.8 / 41.10 / 45.3) □ Effects of voltage changes on performance

Given the following conditions and sequence of events:

- During the last calibration of N-35, an IAE technician improperly adjusted the compensating voltage to a value slightly lower than required by procedure.
- N-36 failed 3 hours ago, the crew entered AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation), Case III (Intermediate Range Malfunction).
- All actions required by AP/1/A/5500/016 have been completed.
- A feedwater transient occurs resulting in a reactor trip.

How does this adjustment error affect the reading on N-35 and how will this condition affect when the source range instruments automatically energize?

- A. N-35 will indicate higher than the actual value.
The source ranges instruments will energize at a lower actual neutron flux.
- B. N-35 will indicate higher than the actual value.
The source ranges instruments will energize at the same actual neutron flux.
- C. N-35 will indicate lower than the actual value.
The source ranges instruments will energize at the same actual neutron flux.
- D. N-35 will indicate lower than the actual value.
The source ranges instruments will energize at a higher actual neutron flux.

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QUESTION 22

A

General Discussion

2/2 IR instruments are required to clear P-6 and automatically energize the SR instruments. Compensating voltage set too low will cause IR indication to be higher than actual flux level, delaying automatic energizing of the SR. > P-10 removed SR voltage. If this is confused and student thinks that <p-10 will energize SR and with one IR already failed low, then "at the same time" is plausible.

Answer A Discussion

Answer B Discussion

N35 indication is correct

Answer C Discussion

Psychometric balance

Answer D Discussion

SR will energize at a lower value N35 will indicate higher. This would be correct if voltage was set higher

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP/1/A/5500/016 ENB

Student References Provided

QuestionBank #	KA_system	KA_number
528	APE033	AK1.01

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to Loss of Intermediate Range Nuclear Instrumentation: CFR 41.8 / 41.10 / 45.3) Effects of voltage changes on performance

QuestionBank #	KA_system	KA_number
529	APE037	AA2.03

KA_desc
 Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: (CFR: 43.5 / 45.13) □ That the expected indication on main steam lines from the S/Gs should show increasing radiation levels

Given the following:

- Unit 1 is operating with a known 0.6 GPD S/G tube leak
- 1A CF pump tripped and results in a plant runback which has been successfully addressed using AP/1/A/5500/003 (Load Rejection)
- The transient has caused the tube leak to increase to 12 GPD.

Which one of the following indications will provide the best indication (most sensitive and timely) that the S/G tube leak has increased?

- A. Observing 1EMF-26, 27, 28 and 29 (Steamline 1A – 1D)
- B. Comparing S/G feed flow to steam flow mismatch
- C. Observing 1EMF-33 (Condenser Air Ejector Exhaust)
- D. Observing 1EMF-71, 72, 73, 74 (S/G A-D leakage)

General Discussion

Bank Question: 605.1 normally, EMF-71-74 are the most sensitive monitors. But these monitors detect N16 radiation that has a high energy (7 MeV) that only is generated when the reactor is operating at power (requires a neutron flux).

Answer A Discussion

This would be true at low power level or in mode 3 where N16 is not present or at low concentrations

Answer B Discussion

Incorrect: Not a sensitive method of comparison – requires large gpm leak rates before this is noticeable.
Plausible: This method will show gross SGTRs

Answer C Discussion

This EMF is not as sensitive as the Stm line EMFs, also the Steam line EMF see the radiation first.

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2003 NRC Q32 (Bank 232)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
SM lesson NSD513

Student References Provided

QuestionBank #	KA_system	KA_number
529	APE037	AA2.03

KA_desc

Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak: (CFR: 43.5 / 45.13) That the expected indication on main steam lines from the S/Gs should show increasing radiation levels

QuestionBank #	KA_system	KA_number
530	EPE074	EA1.01

KA_desc
Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: (CFR 41.7 / 45.5 / 45.6)□RCS water inventory

S/G depressurization to atmospheric pressure has been performed in EP/1/A/5000/FR-C.1 (Response to Inadequate Core Cooling).

1. What are the NC temperature and RVLIS level limits that allow the crew to transition out of this procedure?
2. Why are these limits so much more strict than earlier transition conditions?
 - A.
 1. Two NC Thots less than 328 deg F, RVLIS level greater than 41%
 2. To ensure a hard bubble does not block natural circulation flow
 - B.
 1. Two NC Thots less than 328 deg F, RVLIS level greater than 41%
 2. Due to the NC system being depressurized
 - C.
 1. Two NC Thots less than 350 deg F, RVLIS level greater than 61%
 2. To ensure a hard bubble does not block natural circulation flow
 - D.
 1. Two NC Thots less than 350 deg F, RVLIS level greater than 61%
 2. Due to the NC system being depressurized

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QUESTION 24

D

General Discussion

350 and 61 are correct and NC depressurized is correct. 328 and hard bubble are both from S/G depress for CLA to prevent N2 injection. 41% is the entry requirement and earlier kickout requirement.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
F-0 FR-C.1 and basis

Student References Provided

QuestionBank #	KA_system	KA_number
530	EPE074	EA1.01

KA_desc
 Ability to operate and monitor the following as they apply to a Inadequate Core Cooling: (CFR 41.7 / 45.5 / 45.6) RCS water inventory

QuestionBank #	KA_system	KA_number
531	APE036	AK3.03

KA_desc
Knowledge of the reasons for the following responses as they apply to the Fuel Handling Incidents: (CFR 41.5,41.10 / 45.6 / 45.13) Guidance contained in EOP for fuel handling incident

Unit 1 was conducting refueling operations in mode 6. Given the following events and conditions:

- The containment purge (VP) system is in operation in the REFUEL mode.
- 1VQ-10 (VQ Fans Disch to Unit Vent) is open to inspect the actuator for air leaks.
- Both trains of SSPS are in "TEST".
- The refueling crew dropped a fuel assembly into the refueling cavity.
- 1RAD-1 A/2 "1EMF-39 CONTAINMENT GAS HI RAD" - LIT
- 1RAD-3 D/2 "1EMF-17 REACTOR BLDG REFUEL BRIDGE" - LIT
- The crew has implemented AP/1/A/5500/025 (Damaged Spent Fuel).

As the crew reaches the appropriate steps in AP/1/A/5500/025, which one of the following statements correctly identifies the "as-found" state of the VP system and the position of 1VQ-10?

- A. The VP system is running; 1VQ-10 is open
- B. The VP system is running; 1VQ-10 is closed
- C. The VP system is secured; 1VQ-10 is open
- D. The VP system is secured; 1VQ-10 is closed

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QUESTION 25

C

General Discussion

THIS WAS A REPLACEMENT KA
 1VQ-10 closes based on EMF35,36 Trip 2, but not on EMF 39 (however EMF39 does isolate VQ flow via VQ2A and VQ3B. EMF39 secures VP using 2 separate signals one thru SSPS (Sh) and one directly from the EMF. With both trains of SSPS in test, the Sh will not work, however VP will be secured by EMF 39 directly. The status of VP and VQ are both checked per AP25.

Answer A Discussion

VP is shutdown, partially correct 1VQ10 is open

Answer B Discussion

both parts wrong Psychometric balance

Answer C Discussion

CORRECT

Answer D Discussion

partially correct VP is secured, but VQ10 is open

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	2004 NRC Q86 (Bank 386)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP/25 VQ CNT VP

Student References Provided

QuestionBank #	KA_system	KA_number
531	APE036	AK3.03

KA_desc
 Knowledge of the reasons for the following responses as they apply to the Fuel Handling Incidents: (CFR 41.5,41.10 / 45.6 / 45.13) Guidance contained in EOP for fuel handling incident

QuestionBank #	KA_system	KA_number
532	WE03	EK2.1

KA_desc
Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) 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.

Unit 1 was operating at 100% power when a small break LOCA occurred. Given the following events and conditions:

- Cooldown and depressurization is in progress in ES-1.2 (Post Cooldown and Depressurization)
- NC system pressure has stabilized at 410 psig
- FWST level is 70% and slowly decreasing
- The operators attempt to place 1A ND train in the RHR mode
- 1ND-1B and 1ND-2A (ND Pump 1A Suct from Loop B) will not open

Which one of the following statements correctly describes why 1ND-1B and 1ND-2A will not open?

- A. The NC system pressure is too high
- B. 1NI-185A (ND pump 1A Suct from CNMT Sump) is closed
- C. ECCS has not been reset
- D. 1NI-147B (NI Pumps Recirc to FWST Isol) is open

General Discussion

Bank Question: 1167

Answer A Discussion

Correct: If NC system pressure is > 385 psig, these valves will not open

Answer B Discussion

Incorrect: NI-185A being closed will not prevent 1ND-1B and 1ND-2A from opening – the closed position makes up the interlock.
 Plausible: Reverse logic - If 1NI-185A were open, it would prevent 1ND-1B and 1ND-2A from opening

Answer C Discussion

Incorrect: ECCS does not have to be reset for 1ND-1B and 1ND 2A to open
 Plausible: Resetting ECCS is usually done as an operational matter before starting an ND train in RHR mode.

Answer D Discussion

Incorrect: This is not a valve interlock with 1ND-1B and 1ND-2A
 Plausible: 1NI-147B being open is a valve interlock for ND-28A and NI-136B – if the candidate confuses the valve interlocks.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2004 NRC Q50 (Bank 350)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
PS-ND 9 NSD3.1.30 ND pages 8, 13

Student References Provided

QuestionBank #	KA_system	KA_number
532	WE03	EK2.1

KA_desc
 Knowledge of the interrelations between the (LOCA Cooldown and Depressurization) 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.

QuestionBank #	KA_system	KA_number
533	WE09	EK3.3

KA_desc
Knowledge of the reasons for the following responses as they apply to the (Natural Circulation Operations)
(CFR: 41.5 / 41.10, 45.6, 45.13) □ Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

Given the following conditions and sequence of events:

- One hour ago, a fault in the Unit 1 main generator resulted in a complete loss of offsite power.
- The crew entered EP/1/A/5000/ES-0.2 (Natural Circulation Cooldown).
- The OSM determined that a transition to EP/1/A/5000/ES-0.3 (Natural Circulation Cooldown With Steam Void in Vessel) was required.
- The crew has transitioned to ES-0.3 and is preparing to depressurize the NC system.

Which one of the following describes:

1. A condition that would stop the depressurization of the NC system during this cooldown?
 2. How S/G PORVs are being operated to support NC temperature control?
- A. 1. PZR Level greater than 70%
 2. Manually by NLOs stationed in the doghouses
- B. 1. RVLIS level less than 73%
 2. Manually by NLOs stationed in the doghouses
- C. 1. PZR Level greater than 70%
 2. In manual from the control room
- D. 1. RVLIS level less than 73%
 2. In manual from the control room

General Discussion

S/G PORVS can be operated with N2 backup from the control room. Local PORV operation is required in some accident scenarios where onsite power is lost (EDE, EDF) ES0.2 does have steps to operate locally but no indication that is required from stem. 70% is the PZR Hi Level Alarm. The actual value is 90%.

Answer A Discussion

A is incorrect. PZR Level is > 90% PORVs are operated from the CR.

Answer B Discussion

Right limit. PORVS are operated from the CR

Answer C Discussion

Wrong level, see A above. Right location for PORV operation.

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2006R NRC Q65 (Bank 142)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
ES-0.3 SM

Student References Provided

QuestionBank #	KA_system	KA_number
533	WE09	EK3.3

KA_desc
 Knowledge of the reasons for the following responses as they apply to the (Natural Circulation Operations) (CFR: 41.5 / 41.10, 45.6, 45.13) Manipulation of controls required to obtain desired operating results during abnormal, and emergency situations.

QuestionBank #	KA_system	KA_number
534	SYS003	A2.02

KA_desc
Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; 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)□Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

Unit 1 is in the process of performing a reactor startup. Given the following conditions and sequence of events:

- Control Bank “A” is at 28 steps withdrawn
- 1AD-6, A/5 “NCP HI VIBRATION” - LIT
- 1AD-6, B/5 “NCP HI-HI VIBRATION” - LIT
- The BOP validates that the 1C NC Pump vibration level on the frame is at 6.5 mils using the NC Pump vibration monitor panel.

Which one of the following selections is the list of the correct actions based on this situation?

- A. Reinsert Control Bank “A” rods.
Trip 1C NC Pump.
Go to AP/1/A/5500/004 (Loss of Reactor Coolant Pump).
- B. Trip 1C NC Pump.
Go to AP/1/A/5500/004 (Loss of Reactor Coolant Pump).
- C. Trip the reactor.
Trip 1C NC Pump.
Go to EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).
- D. Pump trip criteria is not yet met.
Go To AP/1/A/5500/008 (Reactor Coolant Pump Malfunction).

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2008 SRO NRC Examination QUESTION 28

C

General Discussion

The correct action is to trip the reactor (based on being in Mode 2), trip the reactor coolant pump, and enter E-0 due to the reactor trip.

Answer A Discussion

Plausible: This would be correct response in Mode 3 with all control banks in.

Answer B Discussion

Incorrect: With the plant in mode 2, E-0 is the correct procedure.

Answer C Discussion

Correct:

Answer D Discussion

Incorrect: The pump trip criteria is > 5 mils on the frame.
 Plausible: If trip criteria were not met, this would be the correct response.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2004 NRC Q64 (Bank 364) Bank Question: 1183

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

Development References
PS-NCP 12 OP/1/B/6100/01G 1AD-6 B/5

Student References Provided

QuestionBank #	KA_system	KA_number
534	SYS003	A2.02

KA_desc
 Ability to (a) predict the impacts of the following malfunctions or operations on the RCPS; 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) Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP

QuestionBank #	KA_system	KA_number
535	SYS004	A1.01

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

Unit 1 is operating at 75% with some confirmed failed fuel. Given the following conditions and sequence of events:

- Letdown flow is 75 gpm.
- Mixed bed and cation bed demineralizers are in service attempting to maintain satisfactory levels of activity in the NC system.
- 1AD-07, F/3 "LETDN HX OUTLET HI TEMP" - LIT
- The BOP notes that letdown temperature has trended to 132 °F and appears to have stabilized.

1. What is the status of the demineralizers at the current time?
2. What is the applicability of Tech Spec 3.4.16 (RCS Specific Activity)?

- A.
 1. The demineralizers have been automatically bypassed.
 2. Modes 1, 2, and 3

- B.
 1. The demineralizers have been automatically bypassed.
 2. Modes 1 and 2, Mode 3 with $T_{avg} \geq 500^{\circ}F$.

- C.
 1. The demineralizers are still in service.
 2. Modes 1, 2, and 3

- D.
 1. The demineralizers are still in service.
 2. Modes 1 and 2, Mode 3 with $T_{avg} \geq 500^{\circ}F$.

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2008 SRO NRC Examination

QUESTION 29

D

General Discussion

INV173 diverst to VCT (bypasses Demins) at 136 degrees. The alarm comes in at 128 degrees.

Answer A Discussion

Demins are not bypassed, wrong ts appl. - psychometric balance

Answer B Discussion

demins are not bypassed, second part correct

Answer C Discussion

first part correct, wrong appl

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
OP/1/B/6100/010H NV lesson TS 3.4.16

Student References Provided

QuestionBank #	KA_system	KA_number
535	SYS004	A1.01

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

QuestionBank #	KA_system	KA_number
536	SYS004	K1.34

KA_desc
Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) □ Interface between CVCS and reactor coolant drain tank; and PZR PCS

Unit 1 is operating at 100%. Given the following initial conditions and sequence of events:

- Excess letdown is in service to repair a leak on the letdown line.
- A PZR pressure channel failure causes 1NC-32B (PZR PORV) and 1NC-36B (PZR PORV) to open.
- 1NC-36B does not re-close and the BOP closed its isolation valve.
- Minimum NC pressure reached during the event was 1820 psig.
- Current NC pressure is 2145 psig and increasing.

Assuming no operator actions other than isolating 1NC-36B:

1. What tank other than the VCT can excess letdown be directed to by 1NV-125B (Excess Letdn Hx Otlt Ctrl)?
2. Is excess letdown currently flowing to the VCT?

- A. PRT; no
- B. PRT; yes
- C. NCDT; no
- D. NCDT; yes

General Discussion

The tanks that can receive input from INV-125B are the VCT and the NCDT. Excess letdown cannot be aligned to the PRT, however, the PORVs in the stem will discharge to the PRT and the seal return (downstream of excess L/D) goes to the PRT. The pressure drop stated in the stem results in a safety injection. Excess letdown (INV-124B) does not isolate on an SI signal however normal letdown does. The seal return isolations close on an St signal but if they think that it is an Sp singla then it would be flowing to the VCT still.

Answer A Discussion

Wrong tank, correct status.

Answer B Discussion

Wrong tank, and status (balance)

Answer C Discussion

Correct

Answer D Discussion

Correct tank, wrong status

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP/10 NV

Student References Provided

QuestionBank #	KA_system	KA_number
536	SYS004	K1.34

KA_desc
 Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: (CFR: 41.2 to 41.9 / 45.7 to 45.8) □ Interface between CVCS and reactor coolant drain tank; and PZR PCS ...

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2008 SRO NRC Examination

QUESTION 31

D

QuestionBank #	KA_system	KA_number
537	SYS005	K4.11

KA_desc
Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following : (CFR: 41.7) □ Lineup for low head recirculation mode (external and internal)

1ND-1B (ND Pump 1A Suct Frm Loop B) and 1ND-37A (ND Pump 1B Suct Frm Loop C) have been aligned to their alternate power supplies.

1. What impact (if any) will aligning the alternate power supply have on the interlocks associated with these valves?
2. How are these valves positioned electrically in the current alignment?
 - A.
 1. Interlocks operate normally
 2. From the main control boards
 - B.
 1. Interlocks operate normally
 2. From the face of alternate MCC breaker
 - C.
 1. Interlocks are removed
 2. From the main control boards
 - D.
 1. Interlocks are removed
 2. From the face of alternate MCC breaker

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QUESTION 31

D

General Discussion

On alt power all interlocks are bypassed. The reason is to allow ND to be aligned on a loss of one train of power. SSF power swaps are completed for items just not ND. Interlocks are normal and would be desired but not available

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
ND lesson

Student References Provided

QuestionBank #	KA_system	KA_number
537	SYS005	K4.11

KA_desc
 Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following : (CFR: 41.7) Lineup for low head recirculation mode (external and internal)

QuestionBank #	KA_system	KA_number
538	SYS006	A1.05

KA_desc
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: (CFR: 41.5 / 45.5) CCW flow (establish flow to RHR heat exchanger prior to placing in service

At 1200, Unit 1 was addressing an NC system leak per AP/1/A/5500/010 (Reactor Coolant Leak) when the leak began to increase. Given the following:

	Time	<u>1200</u>	<u>1206</u>	<u>1212</u>	<u>1218</u>	<u>1224</u>
NC system pressure (psig)		2130	1950	5	5	5
Containment pressure (psig)		0.5	1.3	2.8	4.2	2.5
FWST level (%)		98	97	80	60	35

What is the earliest time that KC flow is established to the ND heat exchangers?

- A. 1206
- B. 1212
- C. 1218
- D. 1224

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QUESTION 32

C

General Discussion

KC aligns to the ND Hx on an Sp signal (3 psig in cont) or on an Ss signal with lo lol fwst level (37%)

Answer A Discussion

An Ss signal is present but FWST level is too high to align KC

Answer B Discussion

An Ss signal occurs on NCS pressure. If student doesn't recognize Ss has already occurred on Cont pressure, this answer is plausible.

Answer C Discussion

Answer D Discussion

Ss with LoLo FWST is present, but KC was aligned on the SP at 1218.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
KC lesson

Student References Provided

QuestionBank #	KA_system	KA_number
538	SYS006	A1.05

KA_desc
 Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ECCS controls including: (CFR: 41.5 / 45.5) □ CCW flow (establish flow to RHR heat exchanger prior to placing in service

QuestionBank #	KA_system	KA_number
539	SYS007	2.4.6

KA_desc
SYS007 GENERIC Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

Given the following sequence of events:

- 1600 A reactor trip occurs
- 1605 The crew entered EP/1/A/5000/FR-H.1 (Loss of Heat Sink).
- 1615 Bleed and feed is initiated.

1. What minimum S/I pump configuration is required to ensure adequate feed?
 2. What minimum number of open NC PORVs is required to ensure adequate bleed?
- A.
 1. One NV pump and one NI pump are running
 2. One NC PORV
 - B.
 1. One NV pump and one NI pump are running
 2. Two NC PORV
 - C.
 1. One NV pump is running
 2. One NC PORV
 - D.
 1. One NV pump is running
 2. Two NC PORV
-

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QUESTION 33

D

General Discussion

Per the background document one NV pump is the minimum flow required to ensure adequate feed if the reactor has been shutdown less than 90 minutes, however, the procedure attempts to start at least 1 NV and 1 NI. 2 PORVS are required open per the basis one may not be adequate depending on NC pressure (i.e. leak size) There is no LOCA mentioned in this question.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
FR-H.1 FR-H.1 background

Student References Provided

QuestionBank #	KA_system	KA_number
539	SYS007	2.4.6

KA_desc
SYS007 GENERIC Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)

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QUESTION 34

B

QuestionBank #	KA_system	KA_number
540	SYS008	K3.03

KA_desc
Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: <input type="checkbox"/> RCP

Unit 1 is in Mode 3 with all shutdown banks withdrawn in preparation for startup when the following occur:

- 1AD-6 E/3 "NCP THERMAL BARRIER KC OUTLET HI/LO FLOW" - LIT
- OAC indicates KC flow to NCP 1C Thermal Barrier HX is 75 gpm.

What effects will this have on NCP 1C and what action should be taken to address the alarm?

- A. NCP 1C seal cooling is being maintained. Verify 1KC-345A (NC Pump 1C Therm Bar Otlf) closes immediately.
 - B. NCP 1C seal cooling is being maintained. Verify 1KC-345A (NC Pump 1C Therm Bar Otlf) closes after a 30 second time delay.
 - C. All seal cooling to NCP 1C is lost. Open the #1 seal bypass valve for the 1C NCP to restore cooling.
 - D. All seal cooling to NCP 1C is lost. Trip NCP 1C to prevent seal failure.
-

General Discussion

The normal flow to the KC thermal barrier is 40 gpm per NCP. The high flow alarm is set at 60 gpm per NCP.

Answer A Discussion

Incorrect: 1KC-345A does not close immediately.
 Plausible: This would be correct except the valve closes after a 30 second delay

Answer B Discussion

Correct: NCP seal cooling is being maintained by NV. 1KC-345A closes after a 30 second time delay.

Answer C Discussion

Incorrect: All seal cooling is not lost. The seal bypass valve is on a common line from all 4 NCPs – not just the 1C NCP.
 Plausible: If he thinks that seal cooling is lost, opening the seal bypass valve would enhance seal cooling to the NCP.

Answer D Discussion

Incorrect: This would be correct if all seal cooling is lost in this mode.
 Plausible: If the candidate does not understand that seal cooling is supplied by the NV with this alarm.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2004 NRC Q53 (Bank 353) Bank Question: 1170

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

Development References	Student References Provided
References: 1. OP-CN-PSS-KC page 12 2. OP-CN-PS-NCP pages 15-19	

QuestionBank #	KA_system	KA_number
540	SYS008	K3.03

KA_desc
 Knowledge of the effect that a loss or malfunction of the CCWS will have on the following: RCP

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2008 SRO NRC Examination

QUESTION 35

A

QuestionBank #	KA_system	KA_number
541	SYS008	K4.09

KA_desc

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) □ The "standby" feature for the CCW pumps

Unit 2 is in Mode 5 with alignment of the KC system for parallel operations per OP/1/A/6400/005 (Component Cooling System). Given the following conditions and events:

- 2A1, 2B1, and 2B2 KC Pumps are in service.
- Both 2ETA and 2ETB are aligned to Unit 1 offsite power
- An 86S relay actuates on 2ETB
- All systems respond appropriately in automatic.

Assuming no operator actions, which Unit 2 KC pumps are in service?

- A. 2A1 KC pump only
- B. 2A1 and 2A2 KC pumps only
- C. 2A1, 2B1, and 2B2 KC pumps only
- D. 2A1, 2A2, 2B1 and 2B2 KC pumps

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2008 SRO NRC Examination

QUESTION 35

A

General Discussion

REPLACEMENT K/A

An 86S relay causes 2ETB to lockout. The blackout signal will not be overridden by the blackout signal, however, a LOCA signal would override the 86S relay and attempt to load LOCA loads. Therefore neither B train pump will re-start. On a normal LOCA or LOOP, both trains of KC would actuate.

Answer A Discussion

CORRECT

Answer B Discussion

If the student thinks that either train B/O causes both trains to start (could be confused with RN which causes both units pumps to start on either unit LOCA or B/O) 2A2 will not start.

Answer C Discussion

If student thinks that the B/O signal will override the 86S relay. This would be correct if a B train only were to occur.

Answer D Discussion

If the student thinks that either train B/O causes both trains to start (could be confused with RN which causes both units pumps to start on either unit LOCA or B/O)

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	MODIFIED	2007 NRC Q36 (Bank 836)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Student References Provided

QuestionBank #	KA_system	KA_number
541	SYS008	K4.09

KA_desc

Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) The "standby" feature for the CCW pumps

QuestionBank #	KA_system	KA_number
542	SYS010	2.1.25

KA_desc
SYS010 GENERIC Ability to interpret reference materials, such as graphs, curves, tables, etc. (CFR: 41.10 / 43.5 / 45.12)

Given the following sequence of events and conditions:

- A pressurizer PORV opens spuriously and will not close
- 5 minutes after the PORV opens, the block valve is closed.
- NC pressure is 1500 psig
- NC temperature is 550 °F
- PRT pressure is 45 psig

What is the approximate pressurizer PORV tailpipe temperature?

Reference provided

- A. 270 °F
- B. 290 °F
- C. 310 °F
- D. 320 °F

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QUESTION 36

B

General Discussion

Tailpipe temperature will be saturation temperature for PRT pressure which is 45psig or 60 psia (psia used for steam tables)

Answer A Discussion

This temperature would be based on correct graph usage but with 45 instead of the correct 60 psia

Answer B Discussion

Answer C Discussion

this is the tempaure iif the student uses correct pressure but goes straight up the graph (constant entropy)

Answer D Discussion

his is the tempaure iif the student uses incorrect pressure and goes straight up the graph (constant entropy)

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Student References Provided
 ASME Steam Tables

QuestionBank #	KA_system	KA_number
542	SYS010	2.1.25

KA_desc
 SYS010 GENERIC Ability to interpret reference materials, such as graphs, curves, tables, etc. (CFR: 41.10 / 43.5 / 45.12)

QuestionBank #	KA_system	KA_number
543	SYS012	A2.02

KA_desc
Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.5) □ Loss of instrument power
.....

Given the following conditions and sequence of events:

- Unit 1 was operating at 100% power.
- The crew has entered AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation System) due to N-42 lower detector failing LOW
- IAE has not yet placed the required bistables in the trip condition per AP/1/A/5500/016.
- A complete loss of 1ERPD occurs

What procedure takes priority for these conditions?

- A. Continue in AP/1/A/5500/016
- B. Enter AP/1/A/5500/029 (Loss of Vital or Aux Control Power)
- C. Enter AP/1/A/5500/003 (Load Rejection)
- D. Enter EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)

General Discussion

With N-42 failed, OTDT picks up. Loss of a vital bus will cause that channels bistables to pick up (in general) including OTDT. This causes a 2/4 situation on the OTDT runback and reactor trip.

Answer A Discussion

This procedure will address the N42 failure but does not take priority.

Answer B Discussion

This procedure will address ERPD failure but does not take priority.

Answer C Discussion

There are 2/4 OTDT and if a reactor trip did not occur, a runback would.

Answer D Discussion

CORRECT.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

<input checked="" type="checkbox"/> Developed <input type="checkbox"/> OPT Approved <input type="checkbox"/> OPS Approved <input type="checkbox"/> NRC Approved	Development References ENB lesson EPL lesson	Student References Provided
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QuestionBank #	KA_system	KA_number
543	SYS012	A2.02

KA_desc
 Ability to (a) predict the impacts of the following malfunctions or operations on the RPS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: (CFR: 41.5 / 43.5 / 45.3 / 45.5) Loss of instrument power

QuestionBank #	KA_system	KA_number
544	SYS012	K5.01

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the RPS: (CFR: 41.5 / 45.7) □ DNB

Which one of the following selections correctly matches the reactor trip signals to their limiting accident?

	<u>Reactor Trip Signal</u>	<u>Limiting Accident/Protection</u>
A.	OPDT OTDT Pzr High Level Pzr Low Pressure	DNB Excessive fuel centerline temperature NC system integrity DNB
B.	OPDT OTDT Pzr High Level Pzr Low Pressure	Excessive fuel centerline temperature DNB DNB NC system integrity
C.	OPDT OTDT Pzr High Level Pzr Low Pressure	NC System integrity Excessive fuel centerline temperature DNB DNB
D.	OPDT OTDT Pzr High Level Pzr Low Pressure	Excessive fuel centerline temperature DNB NC system integrity DNB

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QUESTION 38

D

General Discussion

Answer A Discussion

OPDT and OTDT are reversed

Answer B Discussion

pzt high and low pressure are reversed

Answer C Discussion

psychometric balance

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2007 Audit Exam #2 Q39 (Bank 39)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
TS 3.3.1 and bases IPX

Student References Provided

QuestionBank #	KA_system	KA_number
544	SYS012	K5.01

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the RPS: (CFR: 41.5 / 45.7) <input type="checkbox"/> DNB
.....

QuestionBank #	KA_system	KA_number
545	SYS013	K6.01

KA_desc
Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Sensors and detectors

Initial Conditions:

- Unit 1 was performing a heatup following a refueling outage
- NC Temperature was 400 °F
- NC pressure was 1600 psig
- "A" and "B" shutdown banks were withdrawn
- Containment Pressure Channel II failed high

Current Conditions:

- 1ERPD has lost power
- Containment pressure channels read:
 - Channel I: 0 psig
 - Channel II: +5 psig
 - Channel III: 0 psig
 - Channel IV: -5 psig

Which of the following statements explains the impact on the Engineered Safeguards Features (ESF) system and expected operator actions?

- A. Only Train "A" safety injection actuates.
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- B. Only Train "A" safety injection actuates.
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.
- C. Train "A" and "B" safety injection actuates.
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- D. Train "A" and "B" safety injection actuates.
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.

General Discussion

ESFAS information due to power failure: AP-29 Enclosure 17

Answer A Discussion

Incorrect: Bistables for channels 2&4 are actuated and SSPS receives the input. Only A train actuates due to ERPDP failure.

Answer B Discussion

Correct

Answer C Discussion

Since both trains of input bay receive any signal from the process cabinets, he may assume that 2 press ch would satisfy both SSPS output bays. E-0 is not used in M4, AP-05 transfers to E-0 only on valid indication of high cont press >200 F in the NCS.

Answer D Discussion

Bistables for channels 2&4 are actuated and SSPS receives the input but only A train actuates.. Because the actuations were made in Mode 4, AP-05 is the correct mitigation procedure path.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2005 NRC Q36 (Bank 440) SIMILAR

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

Development References
Lesson <input type="checkbox"/> OP-CN-ECCS-ISE Objectives <input type="checkbox"/> 2 & 3 REFERENCES <input type="checkbox"/> AP/1/A/5500/029 Enclosure 17 (1ERPDP load list) rev 013

Student References Provided

QuestionBank #	KA_system	KA_number
545	SYS013	K6.01

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

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QUESTION 40

D

QuestionBank #	KA_system	KA_number
546	SYS022	K2.02

KA_desc
Knowledge of power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Chillers

Unit 1 is operating at 100% power with the "YV/RN Cool Water Ctrl" switch in the "Local" position.

Which of the following describes what condition (if any) will result in a swap to the RN cooling water supply?

- A. 5 minutes after a loss of MXE only
 - B. 5 minutes after a loss of MXI only
 - C. Immediately after a loss of both MXE and MXI
 - D. No swap to RN supply at any time
-

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QUESTION 40

D

General Discussion

Local - Containment Mechanical Equipment Building Control (Will block Auto Swap to RN if in this position)

Answer A Discussion

This would occur with switch in CR position

Answer B Discussion

This would occur with switch in CR position

Answer C Discussion

This would occur with switch in CR position but its either OR not both, may think that both out requires more urgency.

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
RN lesson

Student References Provided

QuestionBank #	KA_system	KA_number
546	SYS022	K2.02

KA_desc
 Knowledge of power supplies to the following: (CFR: 41.7) Chillers

QuestionBank #	KA_system	KA_number
547	SYS025	A4.01

KA_desc
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Ice condenser isolation valves

Given the following:

- 1AD-13, D/8 "GLYCOL EXPANSION TNK LO-LO LVL" - LIT
- BOP notes that the Unit 1 NF containment isolation valves have closed

Where does the bypass valve for pressure relief between the isolation valves relieve to and from what location may the Glycol Expansion Tank Lo-Lo Level interlock be bypassed?

- A. Glycol Expansion Tank / local NF control panel
 - B. Glycol Expansion Tank / main control room
 - C. Glycol Mixing and Storage Tank / local NF control panel
 - D. Glycol Mixing and Storage Tank / main control room
-

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QUESTION 41

A

General Discussion

Bypass will allow excess pressure from within the penetration to escape INTO containment but not anything out of containment. Interlock Bypass is a key switch on the local panel.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
NF lesson

Student References Provided

QuestionBank #	KA_system	KA_number
547	SYS025	A4.01

KA_desc
 Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Ice condenser isolation valves

QuestionBank #	KA_system	KA_number
548	SYS026	A1.03

KA_desc
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: (CFR: 41.5 / 45.5) □ Containment sump level

Given the following:

- A large break LOCA has occurred.
- Containment pressure is 3.2 psig and slowly decreasing.
- The crew has just transitioned to EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirculation)

What is the minimum containment sump level that will support operation of all ECCS pumps and the NS pumps?

- A. 0.5 ft
- B. 2.5 ft
- C. 3.3 ft
- D. 5.0 ft

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QUESTION 42

C

General Discussion

Per the annunciator response for Containment sump levels on 1AD20 & 21, 2.5 ft will support eccs operation , 3.3 ft will support eccs and NS operations. All levels in distractors are levels mentioned in ES-1.3 which can be assumed entered for large break locas.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
ES 1.3 OP/1/A/6100/007

Student References Provided

QuestionBank #	KA_system	KA_number
548	SYS026	A1.03

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

QuestionBank #	KA_system	KA_number
549	SYS026	K1.01

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

Given the following sequence of events:

- 1200 Unit 1 reactor tripped from 100% power due to a large break LOCA
- 1236 BOP reports:
 - FWST level is currently 36% and decreasing
 - Containment pressure is 3.8 psig and decreasing
- 1240 BOP reports that 1NI-185A (ND Pump 1A Cont Sump Suct) is not open and efforts to open it from the control room have failed.
- 1241 1A ND pump is secured.
- 1245 NLOs have been dispatched to manually open 1NI-185A.
- 1300 NLOs report 1NI-185A is fully open.
- 1301 1A ND pump is started.
- 1305 BOP reports:
 - FWST level is currently 16% and decreasing
 - Containment pressure is 3.1 psig and decreasing

Which one of the following states:

1. What was the status of the 1A NS pump at 1245?
 2. What was the earliest time that any ND Aux Spray could be aligned if needed?
- A. 1. 1A NS pump was running
 2. 1250
- B. 1. 1A NS pump was running
 2. 1301
- C. 1. 1A NS pump was off
 2. 1250
- D. 1. 1A NS pump was off
 2. 1301

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QUESTION 43

A

General Discussion

for ND Aux spray must have 50 min since trip and 1 train of ND in CLR mode.
 ND is secured if the cont sump valve does not open, but NS remains on till 11 % if NS is required.
 As long as NV S/I and NI pump can be supplied from 1 train of ND alone, then after 50 minutes, can use ND aux spray from B train.

Answer A Discussion

Answer B Discussion

NS status is correct, time is not

Answer C Discussion

Time is corect status is now

Answer D Discussion

both incorrect - psychometric balance. Plausible because maybe think that NS is secured along with ND, and that both trains of CLR are needed to allow ND aux spay.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
NS lesson ES 1.3 ES 1.3 background

Student References Provided

QuestionBank #	KA_system	KA_number
549	SYS026	K1.01

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

QuestionBank #	KA_system	KA_number
550	SYS039	K5.01

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the MRSS: (CFR: 441.5 / 45.7) <input type="checkbox"/> Definition and causes of steam/water hammer

Given the following conditions and sequence of events:

- Unit 1 is manually tripped due to a loss of normal feedwater
- Steam generator levels have recovered to normal levels and operators are attempting to throttle CA flow
- "A" train CA cannot be reset and attempts to close 1CA-58A (CA Pump A Disch To S/G 1B Isol) have failed
- NLOs have been dispatched to manually isolate flow to 1B S/G
- When CA flow is secured to 1B S/G, level is noted to be 96% on NR level gauges

Which of the following consequences have increased risk for 1B S/G based on the current water level in that S/G?

1. Failure of S/G PORV and/or SM safety valves to actuate
2. Failure of S/G PORV and/or SM safety valves to reseal following an actuation
3. Water hammer upon initiation of steam flow
4. Mechanical failure of the main steam lines

- A. 1, 2, 3
 - B. 1, 2, 4
 - C. 1, 3, 4
 - D. 2, 3, 4
-

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QUESTION 44

D

General Discussion

2, 3 and 4 are all potential consequences of a SG overfill.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
SM lesson FR-H.3 Background

Student References Provided

QuestionBank #	KA_system	KA_number
550	SYS039	K5.01

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to the MRSS: (CFR: 441.5 / 45.7) Definition and causes of steam/water hammer

QuestionBank #	KA_system	KA_number
551	SYS059	A4.11

KA_desc
Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Recovery from automatic feedwater isolation

Unit 1 is at 75% power when a plant trip occurs due to P-14 actuation. Given the following events and conditions:

- The plant is currently stable.
- The steam dumps have just closed at no-load Tave.
- Steam generator NR levels are 35% in unaffected steam generators and 80% in the affected steam generator.

What action must the operator take to reset CF isolation?

- A. Cycle the reactor trip breakers only.
- B. Cycle the reactor trip breakers and depress the CF isolation reset pushbuttons.
- C. Lower the affected steam generator level and cycle the reactor trip breakers.
- D. Lower the affected steam generator level, cycle the reactor trip breakers and depress the CF isolation reset pushbuttons.

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QUESTION 45

B

General Discussion

--

Answer A Discussion

Incorrect: must also depress FWI pushbuttons Plausible: would be true if P-4/Low Tave FWI had not occurred. Cycling Rx trip breakers does clear auto S/I block following an S/I.

Answer B Discussion

Correct: to clear the P-14, the trip breakers must be cycled. To clear the low tave/p-4 FWI, it must be reset.
--

Answer C Discussion

Incorrect: not need to reduce S/G level on Unit 1 – must reset FWI Plausible: partially correct - would be true on Unit 2 and Low Tave/P-4 FWI had not occurred.

Answer D Discussion

Incorrect: no need to reduce S/G level Plausible: would be true on unit 2.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2003 NRC Q55 (Bank 255) Old Bank Question: 970BH

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan Objective: ISE Obj: 5 References: 1. OP-CN-ECCS-ISE page 21, 22, 23

Student References Provided

QuestionBank #	KA_system	KA_number
551	SYS059	A4.11

KA_desc
Ability to manually operate and monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Recovery from automatic feedwater isolation

QuestionBank #	KA_system	KA_number
552	SYS061	A3.03

KA_desc
Ability to monitor automatic operation of the AFW, including: (CFR: 41.7 / 45.5) □ AFW S/G level control on automatic start

Given the following:

- Unit 2 was operating at 100% power.
- 2A steamline ruptured inside containment resulting in containment pressure rapidly increasing to 3.7 psig.
- Current containment pressure is 2.4 psig and slowly decreasing.
- The crew has just verified that total CA flow is greater than 450 gpm per step 18.a of EP/2/A/5000/E-0 (reactor Trip or Safety Injection).

Within what operating band should the BOP be attempting to control S/G N/R levels?

- A. Between 11% and 50%
 - B. Between 29% and 50%
 - C. Between 9% and 62%
 - D. Between 21% and 62%
-

General Discussion

ACC values should be used since containment pressure exceeded 3 psig even though it has been redced below 3 psig.

Answer A Discussion

Unit 1 non-ACC number

Answer B Discussion

Unit 1 ACC numbers

Answer C Discussion

Unit 2 non-ACC numbers

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
E-0

Student References Provided

QuestionBank #	KA_system	KA_number
552	SYS061	A3.03

KA_desc
 Ability to monitor automatic operation of the AFW, including: (CFR: 41.7 / 45.5) AFW S/G level control on automatic start

QuestionBank #	KA_system	KA_number
553	SYS062	A3.01

KA_desc
Ability to monitor automatic operation of the ac distribution system, including: (CFR: 41.7 / 45.5) <input type="checkbox"/> Vital ac bus amperage

Given the following:

- 2B D/G automatically started due to the incoming breaker to 2ETB spuriously opening.
- While checking D/G operating parameters, the crew notes that D/G 2B "VOLTS" is 4300 V.
- At the direction of the CRS, the BOP adjusts voltage to normal.

How will D/G 2B "AMPS" and "P/F" indications respond to this adjustment?

- | | <u>AMPS</u> | <u>P/F</u> |
|----|-------------|---------------|
| A. | increase | less lagging |
| B. | increase | stay the same |
| C. | decrease | less lagging |
| D. | decrease | stay the same |

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QUESTION 47

B

General Discussion

Students must understand that the D/G is not in parallel and that voltage must be adjusted DOWN. When voltage is reduced, D/G /ETA amps increases. This has no effect on Power Factor. This is OE from an NLO who was attempting to control P/F while operating isynchronus.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
DG3 lesson

Student References Provided

QuestionBank #	KA_system	KA_number
553	SYS062	A3.01

KA_desc
 Ability to monitor automatic operation of the ac distribution system, including: (CFR: 41.7 / 45.5) Vital ac bus amperage

QuestionBank #	KA_system	KA_number
554	SYS063	K2.01

KA_desc
Knowledge of bus power supplies to the following: (CFR: 41.7) <input type="checkbox"/> Major DC loads

Which of the following buses powers the Unit 1 Turbine Emergency Bearing Oil Pump (EBOP)?

- A. 1EDB – 125V Vital Instrumentation and Control Power
 - B. 1EMXF – 600V Unit Essential Power
 - C. 1DPD – 250V Auxiliary Power
 - D. SMXD – 600V Shared Power
-

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QUESTION 48

C

General Discussion

All power supplies listed are B train and there are 2 ac and 2 dc sources of plausible voltage.

Answer A Discussion

This is the only other DC power voltage.

Answer B Discussion

Unit 1 AC power many motors are 600V unit power

Answer C Discussion

Answer D Discussion

shared AC 600 V power. May think that it is prudent to have power available to protect the main turbine bearings from either unit.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
EPL

Student References Provided

QuestionBank #	KA_system	KA_number
554	SYS063	K2.01

KA_desc
 Knowledge of bus power supplies to the following: (CFR: 41.7) Major DC loads

QuestionBank #	KA_system	KA_number
555	SYS063	K3.01

KA_desc
Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7 / 45.6) □ED/G

Unit 1 was operating at 10% power preparing to roll the turbine. Given the following sequence of events:

- 0200 – 1A D/G Battery Charger 1DGCA fails.
- 0700 – D/G 1A Panel, E/5 “LOSS OF DC CONTROL POWER” - LIT
- 0900 - A tornado results in a complete loss of the switchyard.

Assuming no actions have been taken to address the failed charger, which one of the following statements correctly describes the operating status of the 1A D/G and the reason for this status?

- A. The 1A D/G starts because the auto-start function is not dependent on DC control power.
- B. The 1A D/G starts because the loads of the failed charger are supplied from vital power through auctioneering diode 1VADA.
- C. The 1A D/G did not start because it has lost all control power.
- D. The 1A D/G started but did not tie to the bus because the sequencer has lost all control power.

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QUESTION 49

C

General Discussion

--

Answer A Discussion

Incorrect: D/G will not start. DC control power is required for the D/G to start. Plausible: If the candidate thinks that the battery will carry DC control power loads for > 2 hours.

Answer B Discussion

Incorrect: D/G will not start. Plausible: if student thinks that control power to the D/G is available thru VADA. This is reversed, the DGCA supplies power thru VADA to the sequencer.
--

Answer C Discussion

Correct:

Answer D Discussion

Incorrect: D/G will not start. Plausible: The sequencer has normal power available thru IEDA (from vital power)
--

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2004 NRC Q74 (Bank 374) OLD Bank Question: 1212

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson Plan Objective: DG-DG1-14, 19 References: 1. OP-CN-DG-DG1 pages 17-19, 26

Student References Provided

QuestionBank #	KA_system	KA_number
555	SYS063	K3.01

KA_desc Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: (CFR: 41.7 / 45.6) □ ED/G

QuestionBank #	KA_system	KA_number
556	SYS064	A3.07

KA_desc
Ability to monitor automatic operation of the ED/G system, including: (CFR: 41.7 / 45.5) □ Load sequencing

Given the following conditions and sequence of events:

- Unit 2 was operating at 100% power when a LOCA occurred
- Containment pressure peaked at 2.6 psig and is slowly decreasing
- 1A CA Pump failed to start
- "A" train ECCS and D/G load sequencer was reset
- 1A CA Pump was manually started
- A complete loss of switchyard occurs

Assuming no operator actions since the loss of the switchyard, which of the following is a complete list of the ECCS pumps currently in service?

- A. 2A NV, 2A NI, 2A ND, 2B NV, 2B NI, 2B ND
- B. 2A NV, 2B NV, 2B NI, 2B ND
- C. 2B NV, 2B NI, 2B ND
- D. 2A NV, 2B NV

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QUESTION 50

B

General Discussion

With sequencer reset, load groups 4 and 5 (NI, ND) will NOT start on a blackout. This is the situation on "A" train. All will restart on B train since the LOCA signal is still present and it overrides the BO

Answer A Discussion

this would be if neither train of ECCS/SEQ were reset

Answer B Discussion

Answer C Discussion

This is plausible if student thinks that all A train ECCS equipment does not restart on a blackout. NV does...

Answer D Discussion

This would occur if BOTH trains were reset

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
E-0 and backgrnd doc EQB

Student References Provided

QuestionBank #	KA_system	KA_number
556	SYS064	A3.07

KA_desc
Ability to monitor automatic operation of the ED/G system, including: (CFR: 41.7 / 45.5) Load sequencing

QuestionBank #	KA_system	KA_number
557	SYS064	K6.07

KA_desc
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"/> Air receivers

Unit 1 is operating at 100% power. A plant operator reports the following:

- D/G 1A Panel, B/8 "LOW VG AIR TANK PRESS" - LIT
- VG receivers starting air pressure is stable at 149 psig

Which one of the following statements correctly describes the state of readiness of the 1A D/G?

- A. The D/G cannot be manually or automatically started until the VG receiver is repressurized.
- B. The D/G can be manually started and is capable of one or two starts.
- C. The D/G can be automatically started and is capable of one or two starts.
- D. The D/G can be automatically started and is capable of five starts.

General Discussion

Bank Question: 986
 If VG Pressure decreases to less than 150 psig, all automatic start signals are blocked. This conserves enough air for one or two manual start attempts after the cause of the start failure is corrected.

Answer A Discussion

Incorrect: Can be started manually started
 Plausible: psychometric balance

Answer B Discussion

Correct: Can be started manually one or two times

Answer C Discussion

Incorrect: With starting air receiver pressure < 150 psig, auto starts are blocked.
 Plausible: partially correct – capable of one or two manual starts.

Answer D Discussion

Incorrect: Auto starts are blocked below 150 psig – can’t make 5 starts at 150 psig.
 Plausible: This is the FSAR requirement for the number of starts on a D/G

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	2003 NRC Q64 (Bank 264)

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

Development References
1. DG1 lesson 2. Tech Spec Bases 3.8.3 E1

Student References Provided

QuestionBank #	KA_system	KA_number
557	SYS064	K6.07

KA_desc
 Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: (CFR: 41.7 / 45.7) Air receivers

QuestionBank #	KA_system	KA_number
558	SYS073	A2.02

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

Unit 1 is operating at 8% power preparing to place the turbine online when 1EMF-39 "CONTAINMENT GAS HI RAD" detector fails causing a Trip 2 alarm.

1. What is the status of the Unit 1 Containment Evacuation alarm?
 2. What is/are the minimum action(s) required to reset the safety signal generated as a result of this detector failure?
-
- A.
 1. The Containment Evacuation alarm has actuated.
 2. Bypass the failed EMF detector and then RESET the safety signal.
 - B.
 1. The Containment Evacuation alarm has NOT actuated.
 2. Bypass the failed EMF detector and then RESET the safety signal.
 - C.
 1. The Containment Evacuation alarm has actuated.
 2. RESET the safety signal only.
 - D.
 1. The Containment Evacuation alarm has NOT actuated.
 2. RESET the safety signal only.

General Discussion

EMF 39 Trip2 will give an SH signal. This will isolate containment ventilation (VP/VQ). To reset the SH the initiating signal must be cleared and the reset depressed unlike SP and ST which can be reset with the initiating signal present.
 The containment evacuation alarm sounds on this EMF in trip 2 below P-6 (Low in source range) the reactor is currently below P-10 (10% power but well above P6)

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
OP/1/B/6100/010 X

Student References Provided

QuestionBank #	KA_system	KA_number
558	SYS073	A2.02

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

QuestionBank #	KA_system	KA_number
559	SYS076	K2.01

KA_desc
Knowledge of bus power supplies to the following: (CFR: 41.7) Service water

1A RN pump is normally powered from:

- A. 4160V bus 1ETA
 - B. 4160V bus 1FTA
 - C. 6900V bus 1TA long side
 - D. 6900V bus 1TC short side
-

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QUESTION 53

A

General Discussion

These are all A train power supplies for large motors.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
RN lesson EPC lesson

Student References Provided

QuestionBank #	KA_system	KA_number
559	SYS076	K2.01

KA_desc
 Knowledge of bus power supplies to the following: (CFR: 41.7) Service water

QuestionBank #	KA_system	KA_number
560	SYS078	K3.02

KA_desc
Knowledge of the effect that a loss or malfunction of the IAS will have on the following: (CFR: 41.7 / 45.6) <input type="checkbox"/> Systems having pneumatic valves and controls

Unit 2 is in Mode 3 at normal temperature and pressure with all systems in normal alignment preparing for reactor startup.

What affect does a total loss of VI have on the NV system?

- A. Charging flow increases; letdown flow increases
- B. Charging flow increases; letdown flow decreases
- C. Charging flow decreases; letdown flow increases
- D. Charging flow decreases; letdown flow decreases

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QUESTION 54

B

General Discussion

INV294 and INV309 fail open, letdown orifice valves fail closed on loss of air. Letdown isolation valves INV-1A and INV-2A fail close on Loss of VI

Answer A Discussion

partially correct.

Answer B Discussion

Answer C Discussion

reversed - psychometric balance

Answer D Discussion

partially correct.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
NV lesson

Student References Provided

QuestionBank #	KA_system	KA_number
560	SYS078	K3.02

KA_desc
 Knowledge of the effect that a loss or malfunction of the IAS will have on the following: (CFR: 41.7 / 45.6) Systems having pneumatic valves and controls

QuestionBank #	KA_system	KA_number
561	SYS103	K1.07

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

Unit 1 is operating at 100% power with a routine containment air release in progress through 1VQ-10 (VQ Fans Disch To Unit Vent).

1. What is a potential negative consequence of 1VQ-10 failing to close automatically based on containment pressure as designed?
 2. What EMFs in Trip 2 alarm send a closed signal to 1VQ-10?
-
- A.
 1. Non-compliance with technical specification on containment pressure
 2. Unit Vent EMFs (35L, 36L)
 - B.
 1. Unexpected opening of ice condenser inlet doors
 2. Unit Vent EMFs (35L, 36L)
 - C.
 1. Non-compliance with technical specification on containment pressure
 2. Containment EMFs (38L, 39L)
 - D.
 1. Unexpected opening of ice condenser inlet doors
 2. Containment EMFs (38L, 39L)
-

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QUESTION 55

A

General Discussion

IF VQ 10 fails to close based on pressure, it can conceivably draw pressure to negative 2.8 psig which violated TS limits, however, that's not enough to open lower ice cond doors. (0.5 lb/sqft) EMF 35 and 36 causes 1VQ-10 to close. EMFs 38 and 39 will also terminate the release, but by closing the containment isoaltin vlaves, not 1VQ-10.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
VQ lesson

Student References Provided

QuestionBank #	KA_system	KA_number
561	SYS103	K1.07

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

QuestionBank #	KA_system	KA_number
562	SYS001	K2.02

KA_desc
Knowledge of bus power supplies to the following: (CFR: 41.7) □ One-line diagram of power supply to trip breakers

Unit 2 is operating at 100% power with Reactor Trip breaker RTA is out of service for PMs.

If Reactor Trip Bypass breaker BYB is racked in and closed, what will be the overall status of each the Reactor Trip and Reactor Trip Bypass breakers?

- A. RTA – OPEN
RTB – OPEN
BYA – OPEN
BYB – OPEN

 - B. RTA – OPEN
RTB – OPEN
BYA – CLOSED
BYB – CLOSED

 - C. RTA – OPEN
RTB – CLOSED
BYA – OPEN
BYB – CLOSED

 - D. RTA – OPEN
RTB – CLOSED
BYA – CLOSED
BYB – CLOSED
-

General Discussion

If both bypass breakers are closed, all breakers open.

Answer A Discussion

Answer B Discussion

Plausible. In some systems when alternate power is supplied the normal power supply trips open

Answer C Discussion

plausible if student thinks there is an interlock preventing both bypass breakers from being closed at the same time.

Answer D Discussion

IF student thinks the breaker will stay closed.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
IPX

Student References Provided

QuestionBank #	KA_system	KA_number
562	SYS001	K2.02

KA_desc
Knowledge of bus power supplies to the following: (CFR: 41.7) One-line diagram of power supply to trip breakers

QuestionBank #	KA_system	KA_number
563	SYS011	A1.02

KA_desc
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: (CFR: 41.5 / 45.5) Charging and letdown flows

Initial conditions at 1300:

- Unit 2 was at 50% power
- Pressurizer level was at program level
- 2NV-312A (Chrg Line Cont Isol) spuriously closed and could not be reopened
- Operators have taken the following actions per AP/2/A/5500/012 (Loss of Charging or Letdown), Case I (Loss of Charging):
 - Secured letdown
 - Total charging flow has been reduced to 32 gpm
- Excess letdown can not be established

At approximately what time will the pressurizer become inoperable per Tech Spec 3.4.9 (Pressurizer)?

Reference provided

- A. 1434
- B. 1608
- C. 1651
- D. 1825

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QUESTION 57

D

General Discussion

With charging flow at 32 gpm and no letdown, a net of 20 gpm is being added to the NC system. (Stating level is 40% based on 50% rx power) Based on this and a conversion of ~125gallons/% level in the PZR, level will reach the hi level setpoint of 70% at 1434 hrs (T+188 minutes). This is plausible since it is an alarm setpoint associated with abnormally high pressurizer level. The actual inoperability level is 92% which will occur at ~1825 hrs (T+325 minutes).

The other valveus are based on level starting at 55% which is the normal PZR level at 100%.

Answer A Discussion

if assume 100% power level and 70% inoperable

Answer B Discussion

if assume 50 power and 70% level

Answer C Discussion

if assume 100power and 92 inoperable

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2005 SRO Q77 (Bank 481)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson □ OP-CN-PS-ILE rev 23 REFERENCES □ TS 3.4.9 PZR level to gallons graph (REF PROVIDED)

Student References Provided
Pressurizer volume (gal) to level (%) graph

QuestionBank #	KA_system	KA_number
563	SYS011	A1.02

KA_desc
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PZR LCS controls including: (CFR: 41.5 / 45.5) □ Charging and letdown flows

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QUESTION 58

B

QuestionBank #	KA_system	KA_number
564	SYS016	K1.12

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

Unit 1 was operating at 70% when 1C S/G MEDIAN SELECTED Wide Range (WR) Level output to the Digital Feedwater Control System (DFCS) fails low.

How will the DFCS respond to this event?

- A. DFCS will reduce S/G 1C WR level to 50%.
- B. DFCS will generate a "DFCS TROUBLE" alarm only.
- C. DFCS will substitute another S/G's WR level input into "C" loop.
- D. DFCS will switch 1C S/G CF reg valve and CF bypass reg valve to MANUAL.

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2008 SRO NRC Examination **QUESTION 58**

B

General Discussion

WR level is only used at lower power (<25%) when it is used it is median selected

Answer A Discussion

this occurs on unit 2 when a CF pump is lost at >65%

Answer B Discussion

CORRECT

Answer C Discussion

This would be true for CF temperature which substitutes another S/Gs value.

Answer D Discussion

Would need additional failures to cause it to go to manual but since this is the output of a median selected signal it is plausible.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	BANK	TASKMASTER IFE-002-A

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
IFE lesson ARP

Student References Provided

QuestionBank #	KA_system	KA_number
564	SYS016	K1.12

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

QuestionBank #	KA_system	KA_number
565	SYS017	K3.01

KA_desc
Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: (CFR: 41.7 / 45.6) Natural circulation indications

Unit 1 was operating at 100% power when a loss of offsite power caused a reactor trip. The crew has verified natural circulation in ES-0.1 (Reactor Trip Response). Ten minutes later, the operator notes that the thermocouple input to both plasma displays is malfunctioning.

Which one of the following correctly describes a valid indication that natural circulation is continuing?

- A. S/G saturation temperatures are decreasing and REACTOR VESSEL UR LEVEL indication is greater than 100%.
- B. S/G pressures are decreasing and T_{cold} is at S/G saturation temperature.
- C. S/G pressures are decreasing and REACTOR VESSEL D/P indication is greater than 100%.
- D. S/G pressure is at saturation pressure for T_{cold} and REACTOR VESSEL D/P indication is greater than 100%.

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QUESTION 59

B

General Discussion

Bank Question: 911.1

Answer A Discussion

Incorrect: There is no indication of coupling between primary and secondary. Plausible: These are important indications during natural circulation.

Answer B Discussion

Correct:

Answer C Discussion

Incorrect: Reactor Vessel D/P is unavailable during natural circulation.
Plausible: S/G pressure decreases during natural circulation and RVLIS is one of the other plasma display indications.

Answer D Discussion

Incorrect: Reactor Vessel D/P is unavailable during natural circulation.
Plausible: S/G pressure will remain close to saturation for Tcold during natural circulation and RVLIS is one of the other plasma display indications.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2003 RO Q48 (Bank 248)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
HT 1. ES-0.1 page 15 2. ES-0.1 Enclosure 3 page 1

Student References Provided

QuestionBank #	KA_system	KA_number
565	SYS017	K3.01

KA_desc
Knowledge of the effect that a loss or malfunction of the ITM system will have on the following: (CFR: 41.7 / 45.6) Natural circulation indications

QuestionBank #	KA_system	KA_number
566	SYS027	K5.01

KA_desc
Knowledge of the operational implications of the following concepts as they apply to the CIRS: (CFR: 41.7 / 45.7) <input type="checkbox"/> Purpose of charcoal filters

Unit 1 was operating at 100% when a design basis LOCA occurred. Radiation monitoring teams at the site boundary report that projected Iodine 131 dose is 5 Rem.

Which one of the following statements correctly describes the condition of the VE filters that would result in the dose readings noted at the site boundary?

- A. The HEPA filters are saturated
- B. The charcoal filters are saturated
- C. The prefilter/demisters are saturated
- D. The VE filter unit preheaters are energized

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QUESTION 60

B

General Discussion

Bank Question: 834

Answer A Discussion

Incorrect: HEPA filters do not remove radioactive Iodine
 Plausible: HEPA filter remove small particulates

Answer B Discussion

Correct:

Answer C Discussion

Incorrect: Prefilter/demister do not remove Iodine.
 Plausible: If the candidate does not know the prefilter function.

Answer D Discussion

Incorrect: Heaters are supposed to be energized.
 Plausible: If the candidate does not know the heater function.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2003 NRC Q41 (Bank 241)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
I. OP-CN-CNT-VE pages 5-6

Student References Provided

QuestionBank #	KA_system	KA_number
566	SYS027	K5.01

KA_desc
 Knowledge of the operational implications of the following concepts as they apply to the CIRS: (CFR: 41.7 / 45.7) Purpose of charcoal filters

QuestionBank #	KA_system	KA_number
567	SYS035	2.2.40

KA_desc
SYS035 GENERIC Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

Unit 1 is in Mode 5 following refueling. All S/Gs were drained and have just been refilled with condensate water per Chemistry request.

The following conditions existed during the filling operation and have been verified to be the current conditions:

Primary conditions:

- 1A ND Hx inlet temperature 185 °F
- 1B ND Hx inlet temperature 185 °F
- NC pressure 218 psig

Secondary conditions:

- S/G 1A CF inlet temperature 71 °F
- S/G 1B CF inlet temperature 72 °F
- S/G 1C CF inlet temperature 68 °F
- S/G 1D CF inlet temperature 71 °F
- All S/Gs pressures are 0 psig.

Based on the reported conditions, what is the action required by Selected License Commitments?

- A. Reduce NC pressure to less than or equal to 200 psig within 30 minutes.
 - B. Reduce NC pressure to less than or equal to 200 psig within 1 hour.
 - C. Increase 1C S/G secondary temperature to greater than 70 °F within 30 minutes.
 - D. Increase 1C S/G secondary temperature to greater than 70 °F within 1 hour.
-

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QUESTION 61

A

General Discussion

The correct action is to reduce NC pressure within 30 minutes to <200 psig.
 All ACTIONS MUST BE COMPLETE if the CONDITION is entered. Therefore, cannot increase temperature to get out of the action.
 THIS ONE NEEDS WORK

Answer A Discussion

Answer B Discussion

Incorrect: 1 hour will not meet the action.

Answer C Discussion

Cannot increase temperature to revert having to do the actions. Correct time

Answer D Discussion

Cannot increase temperature to revert having to do the actions.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2005 NRC Q86 (Bank 490)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson <input type="checkbox"/> OP-CN-CF-SG Objectives <input type="checkbox"/> 25 REFERENCES <input type="checkbox"/> SLC 16.5-7

Student References Provided

QuestionBank #	KA_system	KA_number
567	SYS035	2.2.40

KA_desc
 SYS035 GENERIC Ability to apply Technical Specifications for a system. (CFR: 41.10 / 43.2 / 43.5 / 45.3)

QuestionBank #	KA_system	KA_number
568	SYS045	A3.05

KA_desc
Ability to monitor automatic operation of the MT/G system, including: (CFR: 41/7 / 45.5) <input type="checkbox"/> Electrohydraulic control

Unit 1 was operating at 100% power. Given the following sequence of events and conditions:

- 1AD-01, F/9 "EHC Emergency Manual Mode" - LIT
- 1B CFPT trips

1. How was the EHC Emergency Manual Mode selected?
2. How do the control valves respond to a manual runback under the above conditions?

- A.
 - 1. automatically
 - 2. the control valves will operate per the valve curves
- B.
 - 1. automatically
 - 2. the control valves will NOT operate per the valve curves
- C.
 - 1. manually
 - 2. the control valves will operate per the valve curves
- D.
 - 1. manually
 - 2. the control valves will NOT operate per the valve curves

General Discussion

Emerg manual mode cannot be manually selected. When the valves are operated (in manual using CV lower), all valves will stroke simultaneously without regard for the programmed valves curves

Answer A Discussion

first part true second part false.

Answer B Discussion

Answer C Discussion

both parts false - psychometric balance

Answer D Discussion

first part is wrong, second part is true

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

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

Development References
OP/1/B/6100/010B EHC lesson

Student References Provided

QuestionBank #	KA_system	KA_number
568	SYS045	A3.05

KA_desc
Ability to monitor automatic operation of the MT/G system, including: (CFR: 41/7 / 45.5) □ Electrohydraulic control
.....

QuestionBank #	KA_system	KA_number
569	SYS071	K4.01

KA_desc
Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Pressure capability of the waste gas decay tank

Which one of the following Waste Gas Decay Tanks (WGDTs) is maintained at a low pressure per the limits and precautions of OP/0/A/6500/003A (Gaseous Waste System (Normal Operations)) to allow it to receive discharge from the relief valves of the other WGDTs and what maximum pressure does it specify?

- A. WGDT A; less than 5 psig
- B. WGDT A; less than 30 psig
- C. WGDT B; less than 5 psig
- D. WGDT B; less than 30 psig

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QUESTION 63

A

General Discussion

A WGDT pressure is normally limited to 5 psig per the OP to allow it to receive relief from other tanks. B tank has a different function- it is used to store nitrogen for shutdown. The hydrogen recombiner operation limit and precaution requires 30 psig minimum for proper operation.

Answer A Discussion

CORRECT

Answer B Discussion

Right tank , wrong pressure

Answer C Discussion

Wrong tank, correct pressure

Answer D Discussion

Both wrong, psychometric balance.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
WG lesson plan page 6 OP/0/A/6500/003 B L/P OP/0/A/6500/003 A L/P

Student References Provided

QuestionBank #	KA_system	KA_number
569	SYS071	K4.01

KA_desc
 Knowledge of design feature(s) and/or interlock(s) which provide for the following: (CFR: 41.7) Pressure capability of the waste gas decay tank

QuestionBank #	KA_system	KA_number
570	SYS079	A4.01

KA_desc
Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) <input type="checkbox"/> Cross-tie valves with IAS

VI system pressure is 98 psig.

Which one of the following statements correctly describes the sequence and position of VI system valves in response to a loss of VI header pressure as pressure decreases?

- A. VI-500 (VI supply to VS) opens
VS-78 (VS supply to VI) opens
- B. VI-500 (VI supply to VS) opens
VS-78 (VS supply to VI) closes
- C. VI-500 (VI supply to VS) closes
VS-78 (VS supply to VI) opens
- D. VI-500 (VI supply to VS) closes
VS-78 (VS supply to VI) closes

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QUESTION 64

C

General Discussion

Bank Question: 282.2

Answer A Discussion

Incorrect: VI-500 closes – not opens
 Plausible: partially correct – VS-78 opens

Answer B Discussion

Incorrect: valve operations are reversed
 Plausible: psychometric balance

Answer C Discussion

Answer D Discussion

Incorrect: VS-78 opens – does not close
 Plausible: partially correct – VI-500 closes.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2003 NRC Q7 (Bank 207)

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
OP-CN-SS-VI page 21 Lesson Plan Objective: VI Obj: 5, 8, 28, 30 AP-22

Student References Provided

QuestionBank #	KA_system	KA_number
570	SYS079	A4.01

KA_desc
 Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8) Cross-tie valves with IAS

QuestionBank #	KA_system	KA_number
571	SYS086	K6.04

KA_desc
Knowledge of the effect of a loss or malfunction on the Fire Protection System following will have on the : (CFR: 41.7 / 45.7) □ Fire, smoke, and heat detectors

Given the following conditions and sequence of events:

- 2A D/G auto-started due to a blackout on 2ETA
- The control room crew notes all loads were sequenced on as required
- A fuel oil line leak occurs resulting in a major fire in the 2A D/G room

Assuming no operator actions since the D/G auto-started:

1. How long will it take for the Cardox system to discharge once the fire is detected?
2. What is the status of the 2A D/G emergency ventilation after the Cardox system discharges?

- A.
 1. 6.5 minutes
 2. Running due to sequencer actuation
- B.
 1. 6.5 minutes
 2. Secured due to Cardox actuation
- C.
 1. 1.5 minutes
 2. Running due to sequencer actuation
- D.
 1. 1.5 minutes
 2. Secured due to Cardox actuation

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QUESTION 65

A

General Discussion

The D/G ventilation will start following the autostart after the B/O signal, since the sequencer has not been reset, they will continue to run. The cardox actuation would normally shutdown the ventiation system. There is a 5.0 electronic time followed by a 1.5 min pneumatic timer. Were there a loss of power to the cardox system , the 5 min electronic timeer would not work and the cardox would dump at 1.5 minutes.

Answer A Discussion

Answer B Discussion

correct time, but fans run

Answer C Discussion

incorrect time, fan status is correct

Answer D Discussion

Both incorrect pyschometric balance

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
RFY lesson DG1 lesson VD

Student References Provided

QuestionBank #	KA_system	KA_number
571	SYS086	K6.04

KA_desc
 Knowledge of the effect of a loss or malfunction on the Fire Protection System following will have on the : (CFR: 41.7 / 45.7) Fire, smoke, and heat detectors

QuestionBank #	KA_system	KA_number
572	GEN2.1	2.1.45

KA_desc
Conduct of Operations□Ability to identify and interpret diverse indications to validate the response of another indication. (CFR: 41.7 / 43.5 / 45.4)

During a control board walkdown, the crew notes that over the last 10 minutes turbine load has decreased from 1209 MW to 1207 MW while reactor power has increased from 99.87% to 100.05%. They suspect a steam leak.

Which set of the following indications could be used to confirm their suspicions?

1. % Steam flow
2. Steam pressure
3. Containment pressure
4. Containment humidity

- A. 1, 2, 3
- B. 1, 2, 4
- C. 1, 3, 4
- D. 2, 3, 4

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QUESTION 66

D

General Discussion

Based on simulator modelling, a steam leak of 1E4 #/hr would cause MW and Rx power indications as shown. Containment pressure would increase as well as humidity. This is less than 1/100th of 1 % steam flow to any given S/G (3.73E6 #/hr) and would not be useful in diagnosing a steam leak.

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
AP/28

Student References Provided

QuestionBank #	KA_system	KA_number
572	GEN2.1	2.1.45

KA_desc
 Conduct of Operations Ability to identify and interpret diverse indications to validate the response of another indication. (CFR: 41.7 / 43.5 / 45.4)

QuestionBank #	KA_system	KA_number
573	GEN2.1	2.1.8

KA_desc
Conduct of Operations□Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)

Terrorists have broken through the security fence and set both Unit 1 main transformers on fire. Security has notified the operating crew that several terrorists are enroute to the control room.

What instructions are provided to the NLO dispatched to the 1ETA switchgear room and which procedure provides that guidance?

- A. Perform a partial transfer to the SSF per AP/1/A/5500/017 (Loss of Control Room)
 - B. Transfer control to the SSF per AP/1/A/5500/017 (Loss of Control Room)
 - C. Perform a partial transfer to the SSF per AP/0/A/5500/045 (Plant Fire)
 - D. Transfer control to the SSF per AP/0/A/5500/045 (Plant Fire)
-

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QUESTION 67

B

General Discussion

AP/17 is used due to being a security event. A full transfer is done for a security event.

Answer A Discussion

Partial transfer is done in AP/45 for plant fires but not per AP/17

Answer B Discussion

Answer C Discussion

Partial transfers are done per AP/45 when fires exist in certain vital area (this is not) and there is a fire, however the security event takes priority.

Answer D Discussion

Full control is not transferred to the SSF in AP/45.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

AP/17 ENCL 11
 AP/45
 AP/17 Symptoms
 AP/17 step 8c

Student References Provided

QuestionBank #	KA_system	KA_number
573	GEN2.1	2.1.8

KA_desc

Conduct of Operations Ability to coordinate personnel activities outside the control room. (CFR: 41.10 / 45.5 / 45.12 / 45.13)

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QUESTION 68

D

QuestionBank #	KA_system	KA_number
574	GEN2.2	2.2.2

KA_desc
Equipment Control □ Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. (CFR: 41.6 / 41.7 / 45.2)

During a power increase to 100% power per OP/1/A/6100/003 (Controlling Procedure for Unit Operation), the "C" Heater Drain Pumps are placed in service at a minimum power level of _____. The purpose of this is to prevent the potential for _____.

- A. 50% / excessive main feedwater pump discharge pressure
 - B. 70% / excessive main feedwater pump discharge pressure
 - C. 50% / deadheading of hotwell and booster pumps
 - D. 70% / deadheading of hotwell and booster pumps
-

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QUESTION 68

D

General Discussion

C Heater drain pumps are placed in service at >70% to prevent the possibility of deadheading the hotwell and CBPs under certain transient conditions. Since the C heater drain pumps pump to the suction of the CFPs, the student may think that the increases suction pressure might increase discharge pressure too high. The second CFP is placed in service at 50%

Answer A Discussion

both parts false, psychometric balance

Answer B Discussion

first part is true

Answer C Discussion

second part is true

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
CM Lesson plan OP/1/A/6100/003

Student References Provided

QuestionBank #	KA_system	KA_number
574	GEN2.2	2.2.2

KA_desc
Equipment Control Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. (CFR: 41.6 / 41.7 / 45.2)

QuestionBank #	KA_system	KA_number
575	GEN2.2	2.2.39

KA_desc
Equipment Control Knowledge of less than or equal to one hour Technical Specification action statements for systems. (CFR: 41.7 / 41.10 / 43.2 / 45.13)

Unit 1 is at 4% power, conducting a plant startup. Given the following events and conditions:

- One control bank "A" rod drops fully into the core
- NCS temperature decreases to 550°F

Which one of the following statements correctly describes an action that is required within 30 minutes by Technical Specifications?

- A. Be in mode 2 with K_{eff} less than 1.0.
- B. Restore rod group within alignment limits.
- C. Verify shutdown margins within the limits specified in the COLR.
- D. Adjust power range N/Is to increase reactor power so that reactor power and thermal power best estimate are equal.

General Discussion

Answer A Discussion

CORRECT

Answer B Discussion

Required per 3.1.4 but not within 30 minutes

Answer C Discussion

Required per 3.1.6 but not within 30 minutes

Answer D Discussion

Thermal power would indicate lower not higher due to increased thermalization of the neutrons. While NI adjustment is a problem, this action does not comply with action 3.4.2.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	MODIFIED	2003 NRC Q30 (Bank 230) Bank Question: 600

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

Development References
Lesson Plan Objective: NC SEQ 10 References: 1. OP-CN-PS-NC page 33 2. Tech Spec 3.4.2 page 1 TS 3.1.4, 3.1.6

Student References Provided

QuestionBank #	KA_system	KA_number
575	GEN2.2	2.2.39

KA_desc
Equipment Control Knowledge of less than or equal to one hour Technical Specification action statements for systems. (CFR: 41.7 / 41.10 / 43.2 / 45.13)

QuestionBank #	KA_system	KA_number
576	GEN2.3	2.3.11

KA_desc
Radiation Control <input type="checkbox"/> Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)

A Unit 1 containment purge is in progress using OP/1/A/6450/015. Given the following events and conditions:

- 1EMF-39(L) (CONTAINMENT GAS (LO RANGE)) spiked to a Trip 2 condition then cleared

Which one of the following statements correctly describes the action required?

- A. The VP release may not be reinitiated until RP draws a new containment air activity sample.
- B. The VP release may be reinitiated after the spike clears. If 1EMF-39 spikes a second time, the release cannot be reinitiated without RP sampling containment air for activity.
- C. The VP release may be reinitiated after the spike clears. If 1EMF-39 spikes a second time, the release may also be reinitiated.
- D. The VP release may be reinitiated if grab samples are taken of Unit Vent activity during subsequent reinitiation.

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QUESTION 70

C

General Discussion

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Answer A Discussion

Incorrect: the OP allows the VP release to be reset twice if due to EMF spike. Plausible: This is a conservative answer.

Answer B Discussion

Incorrect: the OP allows the VP release to be reset twice if due to EMF spike. Plausible: a new sample may be required if the EMF actuates prior to initiating the release.
--

Answer C Discussion

Correct: the OP allows the VP release to be reset twice if due to EMF spike.
--

Answer D Discussion

Incorrect: the OP allows the VP release to be reset twice if due to EMF spike. Plausible: grab samples are required if EMF-39 is inoperable when the release occurs.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2003 NRC Q54 (Bank 254) Bank Question: 968.3

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

Development References
Lesson Plan Objective: VP Obj: 8, 9 References: 1. OP/1/A/6450/015, limits and precautions page 2 rev44 2. OP-CN-CNT-VP page 15

Student References Provided

QuestionBank #	KA_system	KA_number
576	GEN2.3	2.3.11

KA_desc
Radiation Control <input type="checkbox"/> Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)

QuestionBank #	KA_system	KA_number
577	GEN2.3	2.3.4

KA_desc
Radiation Control Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10)

While performing a valve lineup in the boric acid mixing room, an air line failure caused a severe airborne beta contamination problem. A worker received both internal and external contamination that was detected upon attempting to exit the RCA.

Which one of the exposures would exceed the 10CFR20 limit for the worker's annual shallow dose equivalent (SDE) exposure?

- A. 55 Rem external dose to the lens of the eye.
 - B. 17 Rem internal dose equivalent to the lens of the eye.
 - C. 55 Rem external dose to the leg below the knee.
 - D. 17 Rem internal dose to the right forearm.
-

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QUESTION 71

C

General Discussion

--

Answer A Discussion

Incorrect: skin dose equivalent
Plausible: 50 Rem is correct limit for SDE – may confuse with LDE eye dose

Answer B Discussion

Incorrect: SDE is an external skin or extremity dose not an internal dose
Plausible: this is the correct LDE limit (lens of the eye).

Answer C Discussion

Correct: 50 Rem SDE limit to the extremities (below forearm and below knee) or skin.
--

Answer D Discussion

Incorrect: SDE is an external dose not an internal dose
Plausible: the right forearm is the correct part of the anatomy for an SDE - based on confusion of external/internal

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	BANK	2004 NRC Q16 (Bank 316)

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

Development References
HP lesson

Student References Provided

QuestionBank #	KA_system	KA_number
577	GEN2.3	2.3.4

KA_desc
Radiation Control <input type="checkbox"/> Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10)

QuestionBank #	KA_system	KA_number
578	GEN2.3	2.3.7

KA_desc
Radiation Control Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)

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 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 calculated TEDE dose received will be less than if he does wear one.
 - B. The worker should not wear the respirator.
The dose received wearing a respirator will exceed site annual personnel dose limits.
 - 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.
-

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QUESTION 72

A

General Discussion

Radiation exposure comparison:

Without respirator

$DDE = 30 \text{ mrem/hr} \times 1 \text{ hr} = 30 \text{ mrem}$

From airborne contamination:

$CEDE = 10 \text{ DAC } 1 \text{ hr} \times 2.5 \text{ mrem/DAC-hr} = 25 \text{ mrem}$

$TEDE = 30 + 25 = 55 \text{ mrem from job}$

$\text{Total exposure for year} = 1938 + 55 = 1993 \text{ mrem}$

With respirator

$DDE = 30 \text{ mrem/hr} \times 2 \text{ hr} = 60 \text{ mrem}$

$CEDE = 0$

$TEDE = 60 \text{ mrem}$

$\text{Total exposure for year} = 1938 + 60 = 1998 \text{ mrem}$

(With respirator) (Without respirator)

$TEDE = 60 \text{ mrem} > 55 \text{ mrem} = \text{do not use a respirator}$

Answer A Discussion

Correct answer

Answer B Discussion

Incorrect: the dose will not exceed the 2000 mrem limit based on calculation.

Plausible: If the candidate miscalculates the dose

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	2003 NRC Q11 (Bank 211) Bank Question: 353.3

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

Lesson Plan Objective: HP Obj: 2, 4
 1. OP-CN-RAD-HP pages 14-15

Student References Provided

QuestionBank #	KA_system	KA_number
578	GEN2.3	2.3.7

KA_desc

Radiation Control Ability to comply with radiation work permit requirements during normal or abnormal conditions. (CFR: 41.12 / 45.10)

QuestionBank #	KA_system	KA_number
579	GEN2.4	2.4.13

KA_desc
Emergency Procedures / Plan Knowledge of crew roles and responsibilities during EOP usage. (CFR: 41.10 / 45.12)

Per OMP 1-7 (Emergency/Abnormal Procedure Implementation Guidelines), which control room crew position, by title, has primary responsibility for monitoring Critical Safety Function (CSF) status trees during EOP usage?

- A. The OSM has responsibility, but he can delegate the task if necessary.
 - B. The OSM has responsibility and he can not delegate this task.
 - C. The STA has responsibility, but the OSM can reassign the task if necessary.
 - D. The STA has responsibility and this task can not be reassigned.
-

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QUESTION 73

C

General Discussion

Per OMP 1-7, C is correct

Answer A Discussion

Answer B Discussion

Answer C Discussion

Answer D Discussion

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References

OMP 1-7
OMP 1-8

Student References Provided

QuestionBank #	KA_system	KA_number
579	GEN2.4	2.4.13

KA_desc

Emergency Procedures / Plan Knowledge of crew roles and responsibilities during EOP usage. (CFR: 41.10 / 45.12)

QuestionBank #	KA_system	KA_number
580	GEN2.4	2.4.22

KA_desc
Emergency Procedures / Plan Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (CFR: 41.7 / 41.10 / 43.5 / 45.12)

Which one of the following sets of critical safety functions (CSFs):

- is listed in the correct order per the CSF status trees from highest to lowest priority

AND

- forms the bases for protection of the fuel and fuel cladding?

- A. 1. Heat Sink 2. Core Cooling 3. Integrity
- B. 1. Core Cooling 2. Heat Sink 3. NC Inventory
- C. 1. Heat Sink 2. Subcriticality 3. NC Inventory
- D. 1. Subcriticality 2. Heat Sink 3. Integrity
-

General Discussion

Answer A Discussion

Incorrect: Wrong order , wrong functions.

Answer B Discussion

CORRECT

Answer C Discussion

right functions wrong order

Answer D Discussion

wrong functions, right order

Job Level	Cognitive Level	QuestionType	Question Source
RO	Comprehension	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
Lesson <input type="checkbox"/> OP-CN-EP-CSF Objectives <input type="checkbox"/> 2 REFERENCES <input type="checkbox"/> Lesson plan information page 10

Student References Provided

QuestionBank #	KA_system	KA_number
580	GEN2.4	2.4.22

KA_desc
Emergency Procedures / Plan <input type="checkbox"/> Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (CFR: 41.7 / 41.10 / 43.5 / 45.12)

QuestionBank #	KA_system	KA_number
581	GEN2.4	2.4.42

KA_desc
Emergency Procedures / Plan Knowledge of emergency response facilities. (CFR: 41.10 / 45.11)

An offsite release is occurring due to a stuck open S/G PORV on 2C S/G which has a significant tube leak.

Which one of the following states:

1. The emergency facility that assumes responsibility for communications with offsite agencies including the NRC once it is activated?
 2. What is the lowest classification level that requires this facility's activation?
- A. 1. Technical Support Center (TSC)
 2. Alert
- B. 1. Technical Support Center (TSC)
 2. Unusual Event
- C. 1. Operations Support Center (OSC)
 2. Alert
- D. 1. Operations Support Center (OSC)
 2. Unusual Event
-

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QUESTION 75

A

General Discussion

Answer A Discussion

Answer B Discussion

Correct location, wrong classification. The TSC can be activated at this level, but it is not REQUIRED.

Answer C Discussion

Right level , wrong location. This is the center in Charlotte. The NRC and offsiote agency communications go thru the TSC

Answer D Discussion

Both wrong - psychometric balance.

Job Level	Cognitive Level	QuestionType	Question Source
RO	Memory	NEW	

- Developed
- OPT Approved
- OPS Approved
- NRC Approved

Development References
SEP lesson

Student References Provided

QuestionBank #	KA_system	KA_number
581	GEN2.4	2.4.42

KA_desc
Emergency Procedures / Plan <input type="checkbox"/> Knowledge of emergency response facilities. (CFR: 41.10 / 45.11)