
Final Submittal

(Blue Paper)

1. Senior Operator Written Examination With
Answers, KAs, and Answer Sheet

**MCGUIRE OCTOBER 2003
EXAM 50-369 & 50-370/2003-302**

OCTOBER 21, 2003

**U.S. Nuclear Regulatory Commission
McGuire Nuclear Station**

SRO Written Examination

Applicant Information

Name:

Date: October 21, 2003

Facility/Unit: McGuire

Region: II

Reactor Type: W

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 overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require an 80.00 percent to pass. You have eight hours to complete the combined examination, and three hours if you are only taking the SRO portion.

Applicant Certification

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

Applicant's Signature

Results

SRO-Only / Total Examination Values	25 / 25	Points
Applicant's Scores	/	Points
Applicant's Grade	/	Percent

*Bank Question: 1081**Answer: B*

1 Pt(s)

Unit 1 is operating at 100% power when a loss of VI event occurs.
AP/1/A/5500/22 (*Loss of VI*) has been implemented.
VI header pressure is 55 psig and going down.

Which of the following conditions would initially jeopardize the plant and require the SRO to direct tripping the Unit 1 Reactor per AP/1/A/5500/22 (*Loss of VI*)?

- A. 1NV-238 (Charging Line Flow Control) fails closed.
- B. 1CF-23AB (B S/G CF Control Vlv) fails closed.
- C. 1RN-252B (RB Non Ess Sup Cont Outside Isol) fails closed.
- D. 1NV-34A ("A" NC Pump Return Isolation) fails closed.

Distracter Analysis:

- A. **Incorrect:** 1NV-238 fails open.
Plausible: If loss of all charging and seal injection was criteria for Rx trip and operator thought valve failed closed.
- B. **Correct:** Step 12 of AP/22 checks S/G levels stable, if not and level is going down in uncontrolled manner, then **trip** Rx. With 1CF-23 closed, S/G level would be rapidly decreasing.
- C. **Incorrect:** Eventually AP/22 fold out page would direct tripping the Rx if NC Pump temperatures got high enough.
Plausible 1RN-252B does fail closed and could eventually lead to a Rx trip (see above)
- D. **Incorrect:** 1NV-34A fails open on loss of VI.
Plausible

Level: SRO

KA: 065 AA2.06 3.6/4.2

Lesson Plan Objective: OP-MC-AP-22 Obj 3

Source: New

Author: Rob Billings

Level of knowledge: Memory

References:

1. AP/22 Basis Document, page 13

Bank Question: 1075**Answer: B**

1 Pt(s)

Unit 2 has just completed a refueling outage. Two hundred (200) ice baskets were reloaded during the outage. Chemistry has determined that the pH of the ice in the baskets that were reloaded have **an** average pH of 8.0, verses the 9.0 to 9.5 that is required. Boron concentration is 1850ppm.

Which one of the following statements correctly describes the concerns with the sample?

- A. Reduced boron solubility following a LOCA
- B. Reduced iodine removal in the event of **a** LOCA
- C. Increased caustic stress corrosion following a LOCA**
- D. Insufficient sump boron concentration following a LOCA

Distracter Analysis: The key to this question is realizing that the basis for maintaining limits on basic pH is to enhance iodine removal (retention in sump water). A more neutral pH would retain less than the assumed amount of iodine. The other distracters are either incorrect chemical responses to a drop in pH or **a** response not of concern.

- A. Incorrect:
Plausible:
- B. Correct:
- C. Incorrect:
Plausible:
- D. Incorrect:
Plausible:

Level: SRO

KA: SYS 027 G2.1.32 (3.4/3.8)

Lesson Plan Objective: OP-MC-CNT-NF Obj. 18

Source: NEW

Level of knowledge: Memory

Author: JHZ

References:

1. Lesson Plan OP-MC-CNT-NF page 67
2. Tech Spec Basis page B3.6.12-8

Bank Question: 1080**Answer: C**

1 Pt(s)

Given the following events and conditions on Unit 1 :

- Mode 3 in preparation for a reactor startup
- Reactor trip breakers are closed and shutdown banks withdrawn
- I&E is replacing a failed Containment Pressure Channel II transmitter. The associated bistables are in their Technical Specification required position.
- A loss of 1EKVA occurs.

Which one of the following statements correctly describes a concern requiring prompt operator attention?

- A. Placing control rods in manual
 - B. Placing CF Regulating Valves in manual.
 - C. Terminating inadvertent Safety Injection.
 - D. Terminating inadvertent Containment Spray.
-

Distracter Analysis: The key is realizing the failed instrument channel would have one SI bistable tripped by Tech Spec's and the redundant channel trips on the loss of the instrument bus, resulting in an inadvertent SI.

- A. Incorrect: **The** reactor is already tripped.
Plausible: This is **an** immediate action per the Abnormal Procedure for loss of instrument bus, but the SRO is expected to prioritize concurrent procedures, and apply the appropriate one (reactor trip procedure)
- B. Incorrect: Already have FW Isolation
Plausible: . Immediate action per the **AP** (see above)
- C. Correct:
- D. Incorrect: Containment Spray would not initiate
Plausible. If the Operator thought the Tech Spec required position was tripped and thought the failed position of the bistable was tripped.

Level: SRO 10CFR55.43(b)5

KA: 000057 AA2.19

Lesson Plan Objective: OP-MC-IC-IPE Obj 6

Source: BANK

Author: John **Zelm**

Level of knowledge: Analysis

References:

1. Lesson Plan OP-MC-IC-E'E page 37
2. **Tech** Spec 3.3.2, page 3.3.2-10 & 3.3.2-3

*Bank Question: 1088**Answer: C*

1 Pt(s)

Given the following events and conditions on Unit 1:

- Unit 1 is at 100 % power.
- 1NV-244A (Charging Line Cont Outside Isol) fails closed.
- Immediate Actions of AP/1/A/5500/12 (*Loss of Letdown or Charging*) are performed.

Assume no further Operator actions are taken.

Which one (1) of the following describes when the Pressurizer would become INOPERABLE per Technical Specifications?

*Reference Provided**Data Book*

- A. Approximately 4 hours due to low level.
- B. Approximately 7 hours due to low level.
- C. Approximately 4 hours due to high level.
- D. Approximately 7 hours due to high level.

Analysis: **When 1NV-244** closes and letdown is isolated, **1NV-238** will throttle down to its minimum flow limit of **32 gpm**. Assuming **12 gpm** seal return flow that leaves a net positive flow of **20 gpm** into the NC System.

Per DATA book curve **7.38, 55%** level = **8000 gals**. **92%** level = **12700 gals**.

12700-8000=4700 gals.

4700 gals/20 gpm = 235 minutes (approximately **4 hours**) until Reactor trip

4700 gals/12 gpm = 392 minutes (approximately **7 hours**) until Reactor trip

If the examinee incorrectly assumes level will decrease to **17 %** (3000 gals per the curve), $8000 - 3000 = \mathbf{5000}$ gals,

$\mathbf{5000 \text{ gals} / 20 \text{ gpm} = 250 \text{ minutes (4 hours)}}$

$\mathbf{5000 \text{ gals} / 12 \text{ gpm} = 417 \text{ minutes (7 hours)}}$

Distracter Analysis:

A. Incorrect: Level will increase not decrease.

Plausible: If examinee thinks there is a net negative charging flow imbalance of 20 gpm.

B. Incorrect: Level will increase not decrease.

Plausible: If examinee thinks there is **a** net negative charging flow imbalance of 12 gpm.

C. Correct:

D. Incorrect: Level will increase at a rate of 20 gpm.

Plausible: If examinee thinks charging flow imbalance of **12** gpm.

Level: SRO

KA: 000022 ~~AA2.04~~ (2.9/3.8)

Lesson Plan Objective: OP-MC-PS-ILE Obj **7 & 12**

Source: NEW

Level of knowledge: Analysis

References:

1. Lesson Plan OP-MC-PS-ILE page 17
2. Tech Spec 3.4.9, Pressurizer

Bank Question: 1006.1**Answer: D**

1 Pt(s)

An NLO has been dispatched to discharge the Ventilation Unit Condensate Drain Tank (VUCDT) to the Floor Drain Tank (FDT). As the discharge is being established, the 1EMF-44 flow meter ruptures and '1EMF-44 LOSS OF SAMPLE FLOW' annunciator alarms.

Which one of the following describes the reason for this incident?

- A. Both Unit 1 W C D T pumps were simultaneously started.
- B. 1WL-359 (**VUCDT Pump Recirc Throttle**) was opened too far and too much flow was initiated.
- C. Radwaste Chemistry failed to open 1WM-222 (VUCDT to RC Disch Hdr).
- D. 1WL-359 was not throttled prior to VUCDT pump start.

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible
- D. Correct:.

Level: SRO

KA: 073 G 2.1.32(3.4/3.8)

Lesson Plan Objective: OP-MC-WE-RLR Obj. 5

Source: BANK

Level of knowledge: Memory

References:

- 1. OP-MC-WE-RLR page 17
- 2. OP/1/A/6500/01A page 16

Bank Question: 1084**Answer: B**

1Pt(s)

Given the following events and conditions on Unit 1:

- Unit 1 has experienced a large break LOCA.
- 1B ND pump trips 10 minutes into the event and will not restart.
- FWST level is 178" and decreasing.
- REACTOR VESSEL LR LEVEL is 61%.
- Subcooling is -5 degrees.
- EP/1/A/5000/ES-1.3 (*Transfer to Cold Leg Recirc*) is implemented.
- 1NI-185A (RB Sump To Train A ND & NS) can not be opened.
- EP/1/A/5000/ECA-1.1 (*Loss of Emergency Coolant Recirc*) is entered when cold leg recirculation can not be established in EP/1/A/5000/ES-1.3 (*Transfer to Cold Leg Recirc*).
- Time after event occurrence is now T + 45 minutes.

Which one of the following statements in correctly describes the required actions and bases for the above conditions?

Reference Provided**ECA 1.1 and Enclosures I & 4**

- Deleted 10/24/03*
- A. Cross tie Unit 2 and Unit 1 FWST to extend injection time.
 - B. Stop one NV and one ~~NI~~ pump to extend FWST inventory.
 - C. **Attempt to start** an NC pump to provide forced cooling.
 - D. Start the 1A ND pump and reduce SI flow to 390 gpm to match SI flow to decay heat load.

Distracter Analysis:

- A. Incorrect:
Plausible
- B. Correct.
- C. Incorrect:
Plausible: .
- D. Incorrect:
Plausible:

Level: SRO 10CFR55.43(b)5

KA: W/E 11 EA2.2 (3.4/4.2)

Lesson Plan Objective: OP-MC-EP-E-1 Obj. 3

Source: BANK

Level of knowledge: Analysis

References:

- 1.
- 2.

Bank Question: 1082**Answer: D**

1 Pt(s)

Given the following events and conditions on Unit 1:

- Large break LOCA inside containment with fuel damage
- Currently the crew is implementing E-1 (*Loss of Reactor or Secondary Coolant*)
- Hydrogen Analyzer concentration reading is 1% and increasing
- EMF readings are as follows:
 - 1EMF-51A (Reactor Building Activity) 25 R/hr
 - 1EMF-51B (Reactor Building Activity) 37 R/hr

Which one of the following statements describes the correct instrument used to determine ^{the} procedure, and the correct mitigating strategy to address the above conditions?

Reference Provided
EP/1/A/5000/F-0 page 9

- A. Hydrogen Analyzer
EP/1/A/5000/FR-Z.4 (Response to High Containment Hydrogen)
Place Hydrogen recombiners in service at 4%
 - B. Hydrogen Analyzer
EP/1/A/5000/FR-Z.4 (Response to High Containment Hydrogen)
Obtain station management recommendation to reduce hydrogen concentration by feed and bleed.
 - C. 1EMF-51A (Reactor Building Activity)
EP/1/A/5000/FR-Z.3 (Response to High Containment Radiation Levels)
Ensure containment isolation
Place VE in service
 - D. 1EMF-51B (Reactor Building Activity)
EP/1/A/5000/FR-Z.3 (Response to High Containment Radiation Levels)
Ensure containment isolation
Place VE in service
-

Distracter Analysis:

- A. Incorrect:
Plausible:

- B. Incorrect:
- C. Incorrect:
Plausible:
- D. Correct
Plausible:

Level: SRO 10CFR55.43(b)4

KA: AEPE W16 G 2.4.6 (3.1/4.0)

Lesson Plan Objective: OP-MC-EP-FRZ Obj. 3

Source: NEW

Author: CWS

Level of knowledge: Memory

References:

1. OP-MC-EP-FRZ pages 53 & 55
2. EP/1/A/5000/F-0 page 9
3. EP/1/A/5000/FR-Z.3

Bunk Question: I086**Answer: A**

1 Pt(s)

Unit 2 is at 100% power when 2A NC Pump # 1 seal leak-off rapidly increases to **6 gpm.** Unit 2 has entered AP/2/A/5500/08 (*Malfunction of NC Pump*).

Which one of the following correctly describes the concern with this condition and basis for Enclosure 1 (*NC Pump Post Trip Actions*) actions?

- A. High #1 seal leak-off could lead to a seal **LOCA**, closing the individual seal return within **5** minutes of securing the **NC** Pump will control the transient prior to overheating the seals.
- B. High #1 seal leak-off could lead to a seal **LOCA**, waiting longer than five minutes to close the seal return after securing the **NC** Pump allows the **NC** Pump to coast to a stop.
- C. High #1 seal leak-off could lead to excessive #2 seal DP, closing the individual seal return within **5** minutes of securing the **NC** Pump will control transient prior to overheating the seals.
- D. High #1 seal leak-off could lead to excessive #2 seal DP, waiting longer than five minutes to close the seal return after securing the **NC** Pump allows the **NC** Pump to coast to a stop

Distracter Analysis:

- A. Correct:
- B. Incorrect:
Plausible:
- C. Incorrect:
Plausible:
- D. Incorrect:
Plausible:

Level: SRO

KA: SYS 003 A2.01 (3.5/3.9)

Lesson Plan Objective: OP-MC-PS-NCP Obj 12

Source: New

Level of knowledge: memory

References:

1. Lesson Plan OP-MC-PS-NCP page 27.
2. AP/08, Malfunction of NC Pump, Enclosure 1.
3. AP/08 **Basis** Document, Page 27.

Bank Question: 1077**Answer: E**

1 Pt(s)

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

- STA determines RED Path for FR-P.1 (*Response to Imminent Pressurized Thermal Shock Condition*) is valid
- FR-P.1 is entered from FR-Z.1 (*Response to High Containment Pressure*)
- Reactor Coolant (NC) pressure is 350 psig and slowly decreasing

Which one of the following statements correctly describes the procedural guidance for performing an NC system *soak*?

- A. Do not cooldown NC System until temperature has been stable for 60 minutes and raise NC pressure to within the limits of the Post-Soak Limit Curve.
- B. Do not cooldown NC System until temperature has been stable for 60 minutes and do not raise NC pressure**
- C. Cooldown to within the limits of the Post-Soak Cooldown Limit Curve within 30 minutes and do not raise pressure.
- D. Cooldown to within the limits of the Post-Soak Cooldown Limit curve within 30 minutes and raise pressure to within the limits of the Post-Soak Cooldown Limit Curve.

Distracter Analysis: The key to this question is to realize the basis for the “soak” step is to minimize additional stresses (no cooldown for 60 min and no pressure increases).

- A. Incorrect:
Plausible:
- B. Correct: .**
- C. Incorrect:
Plausible:
- D. Incorrect:
Plausible:

Level: SRO 10CFR55.43(b)5 2353X

KA: EAFE 000011 ES 2.14 (3.6*/4.0)

Lesson Plan Objective: OP-MC-EP-FRF' Obj. 4

Source: NEW

Author: CWS

Level of knowledge: Comprehension

References:

1. OP-MC-EP-FRP page **43**

2. EP/1/A/5000/FR-P.1 page 28

Bank Question: 1079**Answer: D**

1 Pt(s)

Given the following events and conditions on Unit 2:

- Unit 2 is at 100% power.
- The following events all occur October 1, 2003
- At 0800, Power Range Detector N41 was removed from service to replace a relay associated with the High Flux **trip** function. The channel was returned to service at 0900.
- At 0915, Power Range Detector N42 was removed from service to replace a relay associated with the High Flux trip function. The channel was returned to service at 1015.
- At 1500, an I&E Supervisor notifies the Control Room SRO that the relays installed earlier in N41 and N42 were the incorrect relays and the High Flux **trip** function associated with those channels will not function as designed.

Which one of the following statements correctly describes required Technical Specification actions based on the above conditions?

Reference Provided
Tech Spec 3.3.1 and Table 3.3.1-1

- A. Place INOPERABLE channels in tripped condition AND reduce THERMAL POWER to $\leq 75\%$ RTP by **0300** October **2,2003**.
- B. Place one INOPERABLE channel in tripped condition within 1 hour AND replace inoperable relay within 6 hours.
- C. Be in MODE 3 by **0300** on October **2,2003**.
- D. Return at least one channel to service by **1600** hours or commence a shutdown to place the unit in Mode **3** by **2200** hours.

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect.
- C. Incorrect:
Plausible:
- D. Correct:
Plausible:

Level: SRO 10CFR55.43(b)2

KA: G2.1.12

Lesson Plan Objective: OP-MC-ADM-TS Objs. 5 & 6

Source: BANK

Level of knowledge: Analysis

References:

1. Tech Spec 3.3.1
2. Tech Spec Table 3.3.1-1

Bank Question: 1089**Answer: C**

1 Pt(s) Unit 2 was operating at 100% power when a small LOCA occurred

Given the following events and conditions:

- The crew has entered EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*)
- Containment pressure reached ~~has~~^{is} 2.5 psig and increasing.
- The inadequate core cooling monitor indicates -10 degrees subcooling.
- All NI and NV pumps have malfunctioned and will not start.

What action (if any) should the crew take regarding the NCPs?

- A. Secure all NCPs.
- B. Secure 3 NCPs and leave 1 running.
- C. No action, the NCPs must continue to run.
- D. NCPs must continue to run, unless "NCP HI Vibration Alarm" is received.

Distracter Analysis:

- A. Incorrect:
- B. Incorrect: .
- C. Correct:
- D. Incorrect:
Plausible:

Level: SRO 10CFR55.43(b)5

KA: 2.4.49 (4.0/4.0)

Lesson Plan Objective: OP-MC-EP-INTROObj 18
OP-MC-ADM-OMP Obj 8

Source: BANK Catawba 2003 NRC **exam**

Level of knowledge: Memory

References:

1. Lesson Plan OP-MC-EP-INTROpage 59

2. OMP 4-3, Use of Abnormal and Emergency Procedures, page 7

Bank Question: 210.1A**Answer: D**

Given the following conditions at 0200:

- Wind direction = 130°
- Wind speed = 8 MPH
- Containment radiation levels
 - 1EMF-51A = 810 R/hr
 - 1EMF-51B = 815 R/hr

Which one of the initial protective action recommendation is correct in accordance with RP/0/A/5700/04 (*General Emergency*).

References Provided

RP/0/A/5700/04

- A. No protective action recommendation is required, continue assessment.
- B. Evacuate zones: L,B,M,C,N,A,D,O,R,E,F,G,H,J
Shelter zones: I,K,P,Q,S
- C. Evacuate zones: L,B,M,C,N,A,D,O,R
Shelter zones: E,F,G,H,I,J,K,P,Q,S
- D. Evacuate zones: L,B,M,C,O,N,R,A
Shelter zones: D,E,F,G,H,I,J,K,P,Q,S

Distracter Analysis:

- A. Incorrect:
Plausible:
- B. Incorrect:
- C. Incorrect:
Plausible:
- D. Correct answer

Level: SRO 10CFR55.43(b)5

KA: G 2.4.44 (2.1/4.0)

Source: **Bank**

Lesson Plan Objective: OP-MC-EP-EMP Obj. 11

References: RP/0/A/5700/004 Enclosure 4.2

Bank Question: 264.1**Answer: D**

1 Pt(s) Unit 2 was operating at 60% power when an ATWS event occurs. Two (2) of the three (3) pressurizer safetyrelief valves fail to actuate. Reactor Coolant pressure transient peaks at 2740 psig.

Which one of the following describes the safety limit value, and allowable action time applicable to this transient?

- A. 2485 psig / 5 minutes
 - B. 2735 psig / 5 minutes
 - C. 2485 psig / 1 hour
 - D. 2735 psig / 1 hour
-

Distracter Analysis:

- A. **Incorrect:** safety limit is 2735 psig, allowable action time is 1 hour
 Plausible: psychometric balance
- B. **Incorrect:** allowable action time is 1 hour
 Plausible: the safety limit is correct and the allowable action time is correct for modes 3-6
- C. **Incorrect:** safety limit is 2735 psig
 Plausible: allowable action time is correct
- D. **Correct Answer:**

Level: SRO 10CFR55.43(b)2

Source: BANK

Author: BCH

Objective: OP-MC-IC-IPEObj. 14

Reference: Tech Spec 2.2
 OP-MC-IC-IPEpage19

KA: 2.2.22(3.4/4.1)

Bank Question: 1087**Answer: B**

1 Pt(s)

Unit 1 is in Mode 3. In preparation for unit start up, maintenance tests the lift settings of 20% of the MSSV's as required by Tech Specs. In each case, maintenance adjusts the lift setting as close to the desired lift setpoint as possible. The following are the test results:

- 1SV-20 lifts at 1203 psig initially, maintenance adjusts lift setting to 1172 psig.
- 1SV-15 lifts at 1215 psig initially, maintenance adjusts lift setting to 1190 psig.
- 1SV-10 lifts at 1170 psig initially, maintenance adjusts lift setting to 1190 psig.
- 1SV-5 lifts at 1225 psig initially, maintenance adjusts lift setting to 1215 psig.

Based on the test results, which one of the following statements is correct?

Reference Provided

Tech Spec 3.7.1

- A. Unit start up can continue provided Rated Thermal Power is maintained below **58%**.
- B. Unit start up can continue provided Power Range set points are reduced to < 58 % within 4 hours and RTP can not exceed 58%.**
- C. Unit start up into MODE 2 is not allowed and Power Range set points must be reduced to < **58 %** within **4** hours.
- D. Unit start up into MODE 2 is not allowed and Power Range set points must be reduced to < 39 % within **4** hours.

Distracter Analysis:

- A. Incorrect: - .
Plausible:
- B. Correct

C. Incorrect: -.

Plausible: -

D. Incorrect: -

Plausible: -

Level: SRO

KA: 2.2.21 (2.3/3.5)

Lesson Plan Objective: OP-MC-ADM-TS Obj 8
OP-MC-STM-MS Obj 13

Source: New-

Level of knowledge: Analysis

References:

1. Tech Spec 3.7.1, Main Steam Safety Valves (MSSVs)
2. Tech Spec 3.0.4, page 3.0-1

*Bunk Question: 495.1**Answer: B*

1 Pt(s)

Unit 1 is in Mode 6. Given the following alarms:

- 1EMF-17 (Spent.Fuel Building Bridge) Trip 2
- 1EMF-36 (Unit Vent High Gas Radiation) Trip 1

Which one of the following describes the correct operator response?

- A. Implement AP/1/A/5500/41 (*Case ZZ Loss of Spent Fuel Level*).
 - B. Implement AP/1/A/5500/25 (*Spent Fuel Damage*).
 - C. Implement AP/1/A/5500/41 (*Case I Loss of Spent Fuel Cooling*).
 - D. Direct Radiation Protection to survey the Spent Fuel Pool area to verify the alarms.
-

Distracter Analysis:

- A. **Incorrect:**
 Plausible:
- B. **Correct: answer**
- C. **Incorrect:**
 Plausible:
- D. **Incorrect**
 Plausible:

Level: SRO 10CFR55.43(b)5

KA; EAPE 061 AA2.01 (3.5/3.7)

Lesson Plan Objective: OP-MC-AP-25 Obj. 1

Source: BANK

Level of Knowledge: Memory

References: AP/1/A/5500/025

Bank Question: 979.1**Answer: D**

1 Pt(s)

Unit 1 is at 100% RTP when:

- The valve positioner for condenser dump valve 1SB-12 fails.
- Control room indication shows the valve OPEN.
- Control Rods **Bank "D"** is parked at 216 steps.

Which one of the following actions correctly describes plant response and the FIRST direction from the SRO to CLOSE the open condenser dump valve?

- A. Rods will withdraw and the SRO should dispatch an NLO to manually close the condenser dump isolation valve.
- B. **No** rod movement will occur and the SRO should instruct RO to depress the 'CLOSE' pushbutton on the condenser dump valve control room switch.
- C. Rods will withdraw and the SRO should instruct IAE to energize the P-12 solenoids to close the condenser dump valve.
- D. No rod movement and the SRO should instruct the RO to select "OFF RESET" on the STEAM DUMP INTLK BYPASS switches.

Distracter Analysis:

- A. Incorrect: This is only done if the OFF **RESET** does not work
- B. Incorrect: There are no pushbuttons for these valves
- C. Incorrect:
Plausible:
- D. Correct: This is the first action of the RNO of the AP..

Level: SRO 10CFR55.43(b)5

KA: SYS 039 A2.04 (3.4/3.7)

Lesson Plan Objective: OP-MC-STM-ISE Obj. 4

Source: MODIFIED

Level of knowledge: Comprehension

*Not explanation
on HD rod not used*

References:

1. OP-MC-STM-DE page 55
2. AP/1/A/5500/01 *Steam Leak* page 5

Bank Question: 121.1**Answer: C**

1 Pt(s)

An operator has been working as listed below:10/15/2003

1900 Starts ~~shift~~ Turnover in control room
1930 Assumes shift duties

10/16/2003

0730 Relieved of duties in control room
0800 Starts NRC requalification exam
1130 Completes NRC requalification exam
Departs site for home and rest
1900 Starts shift turnover
1930 Assumes relief shift duties
0730 Relieved of duties in control room
Departs site

What action (if any) must the operator take to comply with Tech Spec 5.2.2 regarding limits on overtime hours?

Reference Provided

Tech Spec 5.2.2

- A. No action required by the operator
- B. Notify the OSM and obtain approval prior to assuming the watch at **1900** on 10/16.
- C. Submit Request for Work Hours Extension Form to be approved by the Station Manager/Designee prior to 1900 on **10/16**.
- D. Submit Request for Work Hours Extension Form to be approved by the Station Manager/Designee prior to 0330 on **10/17**.

Distracter Analysis:

- A. Incorrect:
- B. Incorrect: .

- C. **Correct:**
 Plausible:
- D. **Incorrect:**
 Plausible:

Level: SRO 10CFR55.43(b)2

KA: 2.1.5 (2.3/3.4)

Lesson Plan Objective: OP-MC-ADM-DIR, Obj 9

Source: BANK

Level of knowledge: Memory

References:

1. Tech Spec 5.2.2, Unit Staff
2. NSD-200, Appendix A, Request for Work Hours Extension

Bank Question: 1076**Answer: B**

1 Pt(s)

Given the following events and conditions on Unit 1:

- FWST Channel 4 level transmitter was discovered frozen at 0600.
- Technical Specification actions for FWST Channel 4 have not been initiated.
- At 0630 a LOCA occurs
- At 0630 a loss of instrument buss 1EKVA occurs and results in FWST Channel 1 low level bistable fails to the non tripped condition.

Which one of the following statements correctly describes the required operator response concerning the **ND** System swap over to the containment sump?

- A. Verify auto swap over occurs as designed when FWST Channel 2 level gets to 180 inches.
- B. Manually swap ND pump suction to the containment sump per **EP/1/A/5000/ES 1.3 (Transfer to Cold Leg Recirc)** when the FWST Channel 2 gets to 180 inches.
- C. Immediately (after 1 minute) reset SI and Sequencers and stop ND pumps.
- D. Select “SS Latched” and then verify auto swap over of ND pump suction per **EP/1/A/5000/ES 1.3 (Transfer to Cold Leg Recirc)** when FWST level Channel 2 gets to 180 inches.

Distracter Analysis: The key to this question is realizing that FWST Channels 1,2 and 4 provide inputs to the autoswap feature of the ND sump valves. This feature is a 2/3 logic. With channel 4 frozen it will not perform its desired function. With Channel 1 not tripped no automatic swapover will occur. Note: because of mods over the years, there is no Channel 3.

- A. Incorrect:
- B. Correct:
Plausible
- C. Incorrect:
Plausible,
- D. Incorrect:
Plausible, if channel 1 bistable was not picked-up and Operator thought “SS Latched” would help

Level: SRO 10CFR55.43(b)5

KA: **SYS** 013 A2.04 (3.6/4.2)

Lesson Plan Objective: OP-MC-FH-FW Obj. 3
OP-MC-PS-ND Obj. 7

Source: NEW

Level of knowledge: Comprehensive

Author: CWS

References:

1. OP-MC-PS-ND pages 29, 31 and 65
2. OP-MC-FH-FW pages 35 and 65

Bank Question: 1085**Answer: B**

1 Pt(s)

You are the Control Room SRO. At 0200 you are notified by RP that Criticality Radiation Monitor 1EMF-17 (Unit 1 Spent Fuel Pool Radiation Monitor) is inoperable.

Which one of the following correctly describes the actions required per SLC 16.7.6 (Radiation Monitoring for Plant Operation)?

- A. Immediately ensure Unit 1 VF system is in the Filtration mode.
- B. Notify RP to immediately provide a portable continuous monitor with the same Alarm Setpoint in the Unit 1 SFP area.
- C. Ensure Unit 1 VF system is in the Filtration mode before 0300.
- D. Notify RP to provide a portable continuous monitor with the same Alarm Setpoint in the Unit 1 SFP area before 0300.

Distracter Analysis:

- A. Incorrect:
Plausible:.
- B. Correct:
- C. Incorrect:.
Plausible:
- D. Incorrect:.
Plausible:

Level: SRO 10CFR55.43(b)4

KA: 2.3.3 (1.8/2.9)

Lesson Plan Objective: OP-MC-WE-EMF Obj 10

Source: New

Level of knowledge: memory

References:

1. SLC 16.9.7 Radiation Monitoring for Plant Operation
- 2.

Bank Question: 871.2**Answer: D**

1 Pt(s)

Unit 1 has implemented EP/1/A/5000/ES-0.3 (*natural Circulation Cooldown with Steam Void in Vessel*) when a YELLOW path occurs on Reactor Coolant Inventory due to RVLIS Upper Range level indication 400% .

Which one of the following statements correctly describes the proper procedure flowpath?

- A. Transition to **EP/1/A/5000/FR-I.3 (*Response to Voids in the Reactor Vessel*)** because EOP usage requires transitioning from an ES procedure for a YELLOW path if there are no other higher priority critical safety functions.
- B. Transition into **EP/1/A/5000/FR-I.3 (*Response to Voids in the Reactor Vessel*)** in order to vent the reactor vessel void through the head vent and collapse the void to allow the cooldown to continue.
- C. Do not implement **EP/1/A/5000/FR-I.3 (*Response to Voids in the Reactor Vessel*)** because this procedure requires starting one NCP, which cannot be done with a void in the reactor vessel due to the potential for gas binding.
- D. Do not implement **EP/1/A/5000/FR-I.3 (*Response to Voids in the Reactor Vessel*)** because this would cause a loss of RCS inventory, as the reactor coolant would flash to steam when the reactor vessel head vent was opened.

Distracter Analysis:

- A. Incorrect: EOP usage allows but does not require transitioning to FR procedures.
Plausible: If candidate is unfamiliar with the EOP usage rules
- B. Incorrect: Although this is a true statement for FR-1.3, it does not apply to the case above when conducting a cooldown in ES-0.3.
Plausible: This is the purpose of FR-I.3.
- C. Incorrect: **An** NCP can be started with a void in the reactor vessel and will be started in FR-1.3 if the attempt to collapse the void by repressurizing the system fails.
Plausible: If the candidate is concerned that starting the NCP will destroy the pump.
- D. Correct: ES-0.3 maintains a void under controlled conditions. FR-1.3 is prohibited in ES-0.3. If the head were vented, the steam void

would not be eliminated. As pressure is decreased, water would flash to steam to replace the steam being vented. Void size would remain essentially the same and the net is a **loss** of system inventory.

Level: SRO10CFR55.43(b)(5)

KA: W/E 10EA2.1 (3.2/3.9)

Lesson Plan Objective: OP-MC-EP-FRIObj. 4

Source: BANK

Level of knowledge: memory

References:

1. OP-MC-EP-EOpage 195
2. OP-MC-EP-FRIpages 13 & 53
3. EP/1/A/5000/FR-I.3 page 2

Bank Question: 999.1**Answer: B**

1 Pt(s) Which one of the following must the Control Room SRO ensure **prior** to authorizing a Liquid Waste Release from the Waster Monitor Tank (WMT)?

- A. A source check has been performed on EMF-44.
 - B. The required number of RC pumps is in operation.
 - C. The “Recommended Release Rate” is equal to the “Allowable Release Rate”.
 - D. The “Expected CPM of EMF 44” and the “EMF 44 Trip 1 Setpoint” are less than the “EMF 44 Trip 2 Setpoint”
-

Distracter Analysis:

- A. Incorrect: EMF 49 is used for WMT releases
Plausible:
- B. Correct:
- C. Incorrect: Recommended release rate must be less than allowable release rate
- D. Incorrect: EMF 49 is utilized
Plausible:

Level: SRO 10CFR55.43(b)

KA: APE 000059 AA 2.0.2 (2.9/3.9)

Lesson Plan Objective: OP-MC-WE-RLR Obj. 3

Source: ~~Bank~~, 2002 NRC Retake **Exam**

Level of knowledge: Memory

References:

1. OP-MC-WE-RLR pages 11 & 13

*Bank Question: 881.1**Answer: B*

1 Pt(s)

Unit one was operating at 100% power when a total loss of onsite and offsite power occurred. Given the following events and conditions:

- 1EVDA is supplying normal full power loads
- No battery charger is available
- Systems operate normally
- “BATT EVCA UNDERVOLTAGE” alarm is LIT

Which one of the following statements correctly describes the SRO’s response to the degraded voltage?

- A. After approximately 1 hour, ensure via the OAC the vital battery output breaker opened automatically when bus voltage decreased to **105** volts.
- B.** Dispatch an NLO to manually open the vital battery output breaker when bus voltage falls to **105** volts.
- C. After approximately 4 hours, ensure via the OAC the vital battery output breaker opened automatically when bus voltage decreased to **107** volts.
- D. Dispatch an NLO to manually open the vital battery output breaker when bus voltage falls to **107** volts.

Distracter Analysis:

- A. Incorrect: the vital battery breaker does not automatically open
Plausible: partially correct – the design time for sustaining loads is 1 hour
- B. Correct: below this value the battery could be damaged or components will begin to fail.
- C. Incorrect: the battery is expected to last for 1 hour and there is no automatic trip associated with low voltage
Plausible: the 4 hour requirement for battery performance is typical of the aux batteries – voltage limit is 107 volts.
- D. Incorrect: the vital batteries are not designed to sustain loads for 4 hours
Plausible: partially correct – DC bus protection is achieved by manually opening the breaker – voltage limit is 107 volts.

Level: SRO 10CFR55.43(b)6

KA: APE 058 AA2.02(3.3*/3.6)

Lesson Plan Objective: OP-MC-AP-15 Obj. 2

Source: Modified

Level of knowledge: Comprehensive

References:

1. AP-15 Background Document pages 4, 40
2. AP/1/A/5500/015 page 57

Bank Question: 181.6**Answer: A**

1 Pt(s)

Unit 1 was operating at 100% when a loss of offsite power and LOCA occurred concurrently. Both Diesel Generators fail to start. The operators implemented EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*) and then transitioned to EP/1/A/5000/ECA-0.0 (*Loss of All AC Power*). In EP/1/A/5000/ECA-0.0 (*Loss of All AC Power*) the crew was attempting to start the 1A Diesel Generator.

Given the following critical safety function status indications:

- Containment – ORANGE
- Inventory – YELLOW
- Integrity – ORANGE
- Subcriticality – ORANGE
- Heatsink – RED
- Core Cooling – RED

Which ONE (1) of the following actions is required by EOPs?

- A. Transition to EP/1/A/5000/FR-C.1 (*Response to Inadequate Core Cooling*) after exiting EP/1/A/5000/ECA-0.0 (*Loss of All AC Power*).
- B. Immediately transition to EP/1/A/5000/FR-C.1 (*Response to Inadequate Core Cooling*).
- C. Transition to EP/1/A/5000/FR-H.1 (*Response to Loss of Secondary Heat Sink*) after returning to EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*).
- D. Immediately transition to EP/1/A/5000/FR-H.1 (*Response to Loss of Secondary Heat Sink*).

Distracter Analysis:

Once E-0 has been exited it is appropriate to implement CSFSTs. However, in the case of ECA 0.0 there is no power and CSFSTs are not implemented until power is restored. Once power is restored then the crew will then return to E-0 and implement the status trees.

- A. Correct
- B. Incorrect:
- C. Incorrect:
- D. Incorrect:

LEVEL: SRO 10CFR55.43(b)5

SOURCE: Modified

LESSON: OP-MC-EP-INTRO

OBJECTIVE: OP-MC-EP-INTRO Obj. 3,6

REFERENCES: OP-MC-EP-INTRO pages 29 & 29
OMP 4-3 Use of Abnormal and Emergency Procedures pages 15 to 18

KA: EAPE WE06 EA 2.1 (3.4/4.2)

Bank Question: 1078**Answer: C**

1 Pt(s)

Given the following events and conditions on Unit 1:

- 90% RTP
- 1A RC pump is tagged for motor repair
- 1B RC pump motor breaker tripped due to overcurrent 2 minutes ago
- While responding to the 6.9 KV switchgear room an NLO accidentally trips open the 1C RC pump breaker

Which one of the following statements describes the correct plant response and sequence of procedure implementation?

- A. An automatic turbine trip occurs on ¾ RC pump trip logic. **AP/1/A/5500/02 (Turbine Generator Trip)** and **EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)** will be implemented.
- B. C-9 permissive will be lost and the unit will runback due to OTDT. **AP/1/A/5500/03 (Load Rejection)** and **AP/1/A/5500/23 (Loss of Condenser Vacuum)** will be implemented.
- C. Condenser vacuum will go down until the turbine trips. **AP/1/A/5500/23 (Loss of Condenser Vacuum)** and **EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)** will be implemented.
- D. Condenser vacuum will go down until the turbine trips. **AP/1/A/5500/23 (Loss of Condenser Vacuum)** and **AP/1/A/5500/02 (Turbine Generator Trip)** will be implemented.

Distracter Analysis: In this event vacuum will decrease until a turbine trip is warranted. This is 20" vacuum by the AOP. Before 20" is reached a turbine trip should occur automatically. The reactor trip if greater than P-8. If the turbine does not trip the reactor will be tripped. In either instance the crew will enter E-0.

- A. Incorrect:
Plausible:
- B. Incorrect:
- C. Correct:
Plausible.
- D. Incorrect:
Plausible:

Level: SRO 10CFR55.43(b)5

KA: SYS 078 A2.02 (2.5/2.7)

Lesson Plan Objective: OP-MC-AP-23 Obj. 2

Source: NEW

Author: RDB

Level of knowledge: Comprehensive

References:

1. AP/1/A/5500/23 page 1
2. AP/23 Background Document page 4

Bank Question: 1083**Answer: D**

1 Pt(s)

Given the following events and conditions on Unit 1:

- Unit 1 is 35% RTP.
- Pressurizer Pressure Control Selector switch is in the '1/2' position
- 1NC-31B (Pressurizer PORV Isolation Valve) is closed due to 1NC-32B (Pressurizer PORV) leakage.
- Channel 2 Pressurizer Pressure fails HIGH.
- Pressurizer Pressure Control Selector switch is placed in the '1/3' position per procedure.
- 1NC-36B fails to close when the Operator places the switch in the closed position.

Which one of the following statements correctly describes the SRO directions to the RO to isolate 1NC-36B?

- A. Place the Pressurizer Master to MANUAL and adjust the output to **50%**.
- B. Place the control switch for 1NC-35B (Pressurizer PORV Isolation Valve) to CLOSED.
- C. Place the control switch for 1NC-36B (Pressurizer PORV) to OVERRIDE.
- D. Place the control switch for 1NC-35B (Pressurizer PORV Isolation Valve) to OVERRIDE.

Distracter Analysis: The key to this question is to realize the AP guidance is written assuming closing the "one" failed PORVs' block valve. Since one block valve is already closed, the procedure guidance is incomplete, and the SRO should cue the RO to utilize the over-ride feature to get the second block valve closed.

- A. Incorrect:
Plausible
- B. Incorrect:
- C. Incorrect:
Plausible:
- D. Correct:
Plausible:

Level: SRO 10CFR55.43(b)5

KA: EAPE 000027 AA2.15 (3.7/4.0)

Lesson Plan Objective: OP-MC-PS-NC Obj. 13

Source: NEW

Author: RDB

Level of knowledge: Comprehensive

References:

1. OP-MC-PS-NC page 37
2. AP/1/A/5500/11 page 2

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
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0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9

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EXAMPLE:

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9

WRITE S.S. NUMBER HERE

MARK S.S. NUMBER HERE

PART 1

CODE S.S. NUMBER AT LEFT BY FILLING IN THE APPROPRIATE BOXES ACCORDING TO THE EXAMPLE

IMPORTANT

USE NO. 2 PENCIL ONLY

• MAKE **DARK** MARKS

• EXAMPLE: A B ☒ D E

• ERASE **COMPLETELY** TO CHANGE

☐ ISS

☐ HLP

☐ NLO-RQ

☐ LO-RQ-RO

☐ LO-RQ-SRO

☐ PPT

☐ ENPF

☐ OTHER

☐ _ _

NAME SROU RETAKE
(PLEASE PRINT)

TEST # Oct 21, 2003

DATE KEY

* My signature on this form is my declaration that the responses given on this examination are entirely my own. It further declares that I am aware that I am subject to termination from the training program immediately, and in addition, will be subject to further disciplinary action up to and including discharge from the company for cheating and/or compromising this exam.

(Trainee Signature)

SCORE: _____

NKS	C1 KEY	NE	C2 KEY
1	A B C D E	51	A B C D E
2	A B C D E	52	A B C D E
3	A B C D E	53	A B C D E
4	A B C D E	54	A B C D E
5	A B C D E	55	A B C D E
6	A B C D E	56	A B C D E
7	A B C D E	57	A B C D E
8	A B C D E	58	A B C D E
9	A B C D E	59	A B C D E
10	A B C D E	60	A B C D E
11	A B C D E	61	A B C D E
12	A B C D E	62	A B C D E
13	A B C D E	63	A B C D E
14	A B C D E	64	A B C D E
15	A B C D E	65	A B C D E
16	A B C D E	66	A B C D E
17	A B C D E	67	A B C D E
18	A B C D E	68	A B C D E
19	A B C D E	69	A B C D E
20	A B C D E	70	A B C D E
21	A B C D E	71	A B C D E
22	A B C D E	72	A B C D E
23	A B C D E	73	A B C D E
24	A B C D E	74	A B C D E
25	A B C D E	75	A B C D E
26	A B C D E	76	A B C D E
27	A B C D E	77	A B C D E
28	A B C D E	78	A B C D E
29	A B C D E	79	A B C D E
30	A B C D E	80	A B C D E
31	A B C D E	81	A B C D E
32	A B C D E	82	A B C D E
33	A B C D E	83	A B C D E
34	A B C D E	84	A B C D E
35	A B C D E	85	A B C D E
36	A B C D E	86	A B C D E
37	A B C D E	87	A B C D E
38	A B C D E	88	A B C D E
39	A B C D E	89	A B C D E
40	A B C D E	90	A B C D E
41	A B C D E	91	A B C D E
42	A B C D E	92	A B C D E
43	A B C D E	93	A B C D E
44	A B C D E	94	A B C D E
45	A B C D E	95	A B C D E
46	A B C D E	96	A B C D E
47	A B C D E	97	A B C D E
48	A B C D E	98	A B C D E
49	A B C D E	99	A B C D E
50	A B C D E	100	A B C D E