Final Submittal

(Blue Paper)

1. Combined ~~RO~~/SRO Written Exam with KAs, Answers, References, and Analysis

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information	
Name:	Region: I / II / III / IV
Date: 5/15/2003	Facility/Unit: Watts Bar Nuclear Unit 1
License Level: RO / SRO	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. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

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

WATTS BAR NUCLEAR PLANT
SENIOR REACTOR OPERATOR NRC EXAMINATION
MAY 15, 2003

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1. 001AA2.05 001/AOI-2/001 AA2.05/4.4/4.6//2/NEW/1/1/
Given the following plant conditions:

- Control rods are moving at 8 steps per minute.
- Control Rods are in AUTO.
- Reactor power was initially 75% and stable, but is now rising slowly.
- Tavg was 580°F and stable but is now rising slowly.
- Tref was 579°F and is currently stable at that value.
- Turbine load is 560 MWe and stable.

Which ONE of the following describes the event responsible for these plant conditions and the appropriate operator response?

	Event	Operator Action
A.	Continuous rod withdrawal	Place rod control in MANUAL
B.	Continous rod insertion	Place rod control in MANUAL
C.	Continuous rod withdrawal	Trip reactor and go to E-0
D.	Continuous rod insertion	Trip reactor and go to E-0

The correct answer is A.

1. *Correct* - indications of rising power and Tavg indicate rod outward motion and operator should place rods to MANUAL per AOI-2.
2. Incorrect - indications of rising power and Tavg indicate rod outward motion rather than inward motion which produces opposite results. Operator should place rods to MANUAL per AOI-2.
3. Incorrect - indications of rising power and Tavg indicate rod outward motion, the operator would place rods to MANUAL. Rx trip would only be required if rod motion did not stop.
4. Incorrect - indications of rising power and Tavg indicate rod outward motion rather than inward motion which produces opposite results. Operator should place rods to MANUAL per AOI-2, Rx trip would only be required if rod motion did not stop.

Reference: AOI-2; 3-OT-SYS085A
CFR 55. 43.5, 45.13
SRO #1

2. 003AK3.08 001/TS 3.1.5, AOI-2/003AK3.08/3.1/4.2//2/BANK/1/1/YES
Given the following plant conditions:

- The Unit was at 100% RTP.
- A runback has occurred due to a #3 HDTP trip and the plant is stable.
- Control Bank D Rod H-12 dropped into the core as rods stepped in to control Tavg.
- The operators are preparing to recover Rod H-12.

Which ONE of the following describes the status of Control Rod H-12 at this time?

A. The rod is considered operable since it can be moved by the control rod drive mechanism.

B. The rod is considered operable since it meets the required rod drop time by being on the bottom.

C. The rod is considered inoperable because it is more than 12 steps out of alignment with it's bank.

D. The rod is considered inoperable because it can not perform it's required function of controlling axial flux difference (AFD).

The correct answer is C.

a. Incorrect - rod is inoperable even though it may be moved it is out of alignment with the rest of the rods in it's group. Examinee may believe if the rod can be moved it is operable.
b. Incorrect - rod is inoperable even in what the examinee may mistakenly believe is a safe position. It is not in alignment with the other rods in it's group.
c. *Correct* - rod is inoperable due to being out of alignment with other rods in it's group by > 12 steps.
d. Incorrect - rods inoperable, however the ability of the rod to control flux is not a determination of control rod operability. The examinee may confuse the importance of rods in the control of AFD which also has T/S limits.

Reference: Tech Spec LCO 3.1.5; AOI-2;
Bank AOI0200. 001
CFR 41.5, 41.10 / 45.6, 45.13
SRO #2

3. 005AK3.06 001/ES-0.1/005 AK3.06/3.9/4.2//2/NEW/1/1/
What actions are performed in ES-0.1, Reactor Trip Response, if 3 control rods are not fully inserted (rod bottom lights NOT lit and the the RPIs are NOT at bottom of scale) and why?

A. Borate 6300 gallons of boric acid from the BAT, ensures adequate shutdown margin.

B. Borate 9750 gallons of boric acid from the RWST, ensures adequate shutdown margin.

C. Borate 9750 gallons of boric acid from the BAT, ensures adequate shutdown margin.

D. Borate 6300 gallons of boric acid from the RWST, ensures adequate shutdown margin.

The correct answer is C

a. Incorrect - The 6300 gallons would be for 2 stuck rods, the BAT and shutdown margin are correct.
b. Incorrect - The 9750 gallons and the adequate shutdown margin are correct, the RWST is wrong.
c. Correct - Need to know the amount of boric acid, the correct source and the reason which are listed correctly in this answer.
d. Incorrect - The reason is incorrect, borate to ensure adequate shutdown margin.

Reference: ES-0.1 Reactor Trip Response, 3-OT-EOP0000
CFR 41.8/41.10/45.3
SRO #3

4. 011 EA1.03 002/3-OT-EOP000/011 EA1.03/4.0/4.0//2/NEW/1/1/YES
Given the following conditions:

- A Large Break LOCA has occured.
- The crew is performing E-0.
- Containment pressure is 3.5 psig.
- RCS pressure is 200 psig and dropping.

Which ONE of the following is the basis for tripping the RCPs?

A. A Phase B signal has been initiated.

B. Preclude core uncovery from RCPs tripped later in the event.

C. Prevents sudden uncovery of the core after inventory depletion .

D. Ensures core heat removal to help prevent peak clad temperatures from exceeding 2200°F during a LOCA.

The correct answer is A

a. Correct - CCS has been isolated to the RCP oil coolers and the RCPs must be taken out of service.
b. Incorrect - RCP trip based on RCS pressure is to prevent excessive inventory loss and tripping RCPs early will preclude core uncovery from RCPs indadvertently tripped later, during a small break LOCA, this does not apply to a large break LOCA.
c. Incorrect - Trip criteria is not based on preventing a sudden uncovery of the core after an inventory depletion.
d. Incorrect - The trip criteria is not based on preventing exceeding the peak clad temperatures.

Reference: 3-OT-EOP0000
CFR 41.7/45.5/45.6
SRO # 4

5. 015AK1.05 001/AOI-5/015AK1.05/2.7/3.3//2/NEW/1/1/
Given the following plant conditions:

- Reactor power is stable at 15%.
- Control rods in MANUAL.
- Crew is in process of transferring station service from alternate to normal.
- Loop 4 RCP trips while transferring from alternate power to normal.

Which ONE of the following identifies the correct response of core exit temperature and loop 4 Tavg immediately following Trip of loop 4 RCP?

	Core Exit Temp	Loop 4 Tavg
A.	Rises	Rises
B.	Rises	Drops
C.	Drops	Drops
D.	Drops	Rises

The correct answer is B.

a. Incorrect - core exit temperature (ΔT) rises since flow is reduced and power remains constant, however loop 4 Tavg will actually drop not rise due to loss of heat transfer to that loop from the core. Examinee may confuse core exit and loop responses.
b. *Correct* - core exit temperature (ΔT) rises since flow is reduced and power remains constant and loop 4 Tavg will drop due to loss of heat transfer to that loop from the core.
c. Incorrect - core exit temperature (ΔT) will actuallly rise since flow is reduced and power remains constant, however the loop 4 Tavg will drop due to loss of heat transfer to that loop from the core.
d Incorrect - core exit temperature will actuallly rise (ΔT) will actuallly rise since flow is reduced and power remains constant, and loop 4 Tavg will actually drop not rise due to loss of heat transfer to that loop from the core.

Reference: AOI-5, Unscheduled Removal of One RCP;
CFR 41.8, 41.10 / 45.3
SRO #5

6. 024AA2.02 001/AOI-34/024AA2.02/3.9/4/4//1/NEW/1/1/YES
Given the following plant conditions:

- While at 100% power a control problem caused Bank D control rods to insert.
- The operator placed rod control in MANUAL and stopped the rod insertion.
- ROD INSERTION LIMIT LO-LO annunciator is lit.
- Rods cannot be moved until trouble shooting is complete.
- The operator began immediate boration in accordance with AOI-34, Immediate Boration.
- 1-FCV-62-138, Emergency Borate Flow Control Valve is mechanically bound and cannot be opened.

Which ONE of the following actions would the operator be directed to take next in accordance with AOI-34?

A. Align RWST to the CCP suction by opening 1-FCV-62-135 and -136 and closing 1-FCV-62-132 and -133.

B. Bypass CVCS mixed bed to eliminate potential for deboration.

C. Place normal boration in service to the CCP suction.

D. Locally open manual boration valve 1-ISV-62-929.

The correct answer is D.

1. Incorrect - This flowpath would be utilized if the manual boration valve did not provide immediate boration.
2. Incorrect - This action may be selected if the applicant confused actions in this AOI with actions in AOI-3, Malfunction of Reactor Makeup Control.
3. Incorrect - This action would have been taken prior to attempting to open 1-FCV-62-138.
4. *Correct* - This action is correct and in the correct sequence according to AOI-34.

Reference: AOI-34, Immediate Boration; 3-OT-SYS062A, 3-OT-AOI3400
CFR 43.5 / 45.13
SRO # 6

7. 026G2.4.11 001/AOI-15/026 G2.4.11/3.4/3.6//2/NEW/1/1/
Given the following conditions:

- The plant is at 100% power and BOL conditions.
- The crew implemented AOI-15, Loss of Component Cooling Water (CCS).
- The U1 CCS surge tank level is rising and the crew has determined that A CCS Hx has a tube leak.

How should the crew respond to the above?

A. Trip the reactor then stop the RCPs then enter E-0, shutdown the A train CCS and pull to lock all A train ECCS pumps.

B. Reduce ERCW pressure to be slightly less than CCS pressure and shut the unit down.

C. Crosstie A train CCS header to B train CCS header and place additional B train ERCW pumps inservice and shutdown the unit.

D✓ Reduce ERCW pressure to be slightly greater than CCS pressure and check if CCS Hx can remain inservice.

The correct answer is D.

A. Incorrect - This is the correct response for a loss of A train CCS, but not inleakage.
B. Incorrect - This would stop the inleakage but then would force the crew to section 3.2 of AOI-15.
C. Incorrect - Cross tying the headers would mitigate the problem but it's not allowed in mode 1, thus would force the unit into LCO 3.0.3
D. Correct - AOI-15, 3.3 step 8 requires pressure to be slightly greater than CCS to reduce leakage

Reference: AOI-15, 3.3 step 8; 3-OT-AOI1500
CFR 41.10/43.5/45.13
SRO #7

8. 029EK2.06 002/FR-S.1/029EK2.06/2.9/3.1//2/NEW/1/1/
Given the following conditions:

- Plant is operating at 100% power with all systems normal.
- A primary transient results in RCS pressure dropping to 1750 psig and subsequently stabilizing at 1810 psig.
- The operating crew manually initiated Reactor Trip and Safety Injection

- Both reactor trip breakers RTB "A" and "B" fail to open.
- The Operating crew implements FR-S.1, ATWS.
- The Turbine Bldg AUO trips both CRD M-G Sets at the 480V Unit Boards.
- All rods insert into the core after CRD M-G-Set output voltage decays.
- The OAC depressess both SI RESET TRAIN A(B) reset pusbuttons and both RESET PHASE A TRAIN A(B) CNTMT ISOL pushbuttons.

Under these conditions, which ONE of the following describes the status of the block/reset circuitry?

A. ✔ NEITHER Train "A" nor "B" SI will reset; NEITHER Train "A" nor "B" Phase A will reset.

B. BOTH "A" and "B" SI will reset; BOTH Train "A" and "B" Phase A will reset.

C. NEITHER Train "A" nor "B" SI will reset; BOTH Train "A" and "B" Phase A will reset.

D. BOTH "A" and "B" SI will reset; NEITHER Train "A" nor "B" Phase A will reset.

The correct answer is A.

a. *Correct* - Since neither RTB opened neither SI nor phase A will reset since P-4 contacts from RTB postions are not in correct state when breakers remain closed and RCS pressure remains below SI setpoint.
b. Incorrect - Applicant must recognize that the rods are only in the core due to shutting down CRD M-G sets. Both SI and Phase signals can only be reset if the corresponding Train's RTB is open.
c. Incorrect - Neither train SI can be reset due to P-4 contact position for corresponding RTB and as long as SI cannot be reset, neither can Phase A.
d. Incorrect - Neither train SI can be reset due to P-4 contact position for corresponding RTB and as long as SI cannot be reset, neither can Phase A.

Reference: FR-S.1; 3-OT-SYS063A
CFR 41.7/45.7
SRO #8

9. 040AA1.24 002/E-2/040 AA1.24/3.8/3.8//2/BANK/1/1/
Given the following conditions:

- #2 S/G PORV has failed open and is unable to be isolated.
- #2 S/G pressure is 0 psig.
- #1 RCS Thot = 450°F, Tcold= 436°F
- #3 RCS Thot = 440°F, Tcold= 432°F
- #4 RCS Thot = 460°F, Tcold= 435°F
- All Core Exit Thermocouples are 460°F
- RCS temperatures are slowly rising.
- E-2, "Faulted Steam Generator Isolation," is being performed.

Using Steam Tables determine which ONE of the following pressures the PORVs on the intact steam generators should be set for to stabilize RCS temperature?

A. 362 psig

B. 482 psig

C. 452 psig

D. 467 psig

The correct answer is C

a. Incorrect - Using Psat for the hottest RCS temperature is 467 psia and 452 psig.
b. Incorrect - Using Psat for the hottest RCS temperature is 467 psia and 452 psig.
c. Correct - Using Psat for the hottest RCS temperature is 467 psia and 452 psig.
d. Incorrect - Using Psat for the hottest RCS temperature is 467 psia and 452 psig.

Reference: E-2 Rev 10 Steam Tables, 3-OT-EOP0200
Bank EOP0200.04.03
CFR 41.7 / 45.5 / 45.6
SRO #9

10. 051AA1.04 001/AOI-11/051 AA1.04/2.5/2.5//1/BANK/1/1/
Which ONE of the following combinations requires BOTH the reactor and the turbine to be tripped per AOI-11, " Loss of Condenser Vacuum"?

A. Generator Load 640 MWe; Condenser Back Pressure 3.9 in Hga.

B. Generator Load 620 MWe; Condenser Back Pressure 5.6 in Hga.

C. Generator Load 560 MWe; Condenser Back Pressure 4.8 in Hga.

D. Generator Load 540 MWe; Condenser Back Pressure 5.9 in Hga.

The correct answer is B

a. Incorrect - Per AOI-11, between 600 MW and 1050 MW at 5.5 inches Hga, trip the reactor.
b. Correct - Per AOI-11, between 600 MW and 1050 MW at 5.5 inches Hga, trip the reactor.
c. Incorrect - Per AOI-11, between 365 MW and 600 MW at 5.5 inches Hga the turbine is tripped and not the reactor.
d. Incorrect - Per AOI-11, between 365 MW and 600 MW at 5.5 inches Hga the turbine is tripped and not the reactor.

The examinee must be able to determine the appropriate load and vacuum for when the rods need to be inserted (operated) per the guidelines in AOI-11.

Reference: AOI-11
Bank AOI1100.1
CFR 41.7 / 45.5 / 45.6
SRO # 10

11. 055G2.2.25 002/LCO 3.8.4 BASIS/055 G2.2.25/2.5/3.7//2/NEW/1/1/YES
Given the following:

- Unit operationg at 100% power.
- A Loss of All AC Power occurs at 0700.

Which ONE of the following identifies the time at which the batteries will not be able to carry design load in accordance with the Tech Spec basis for LCO 3.8.4 assuming no other accident in progress?

A. 0900

B. 1100

C. 1500

D. 1900

The correct answer is B.

a, c, d. Incorrect - The examinee could confuse any of these times with the correct time, the times are consistent with other LCO times, 2 hours, 8 hours and 12 hours.
b. Correct - Refer to LCO Basis 3.8.4, "Each vital battery has adequate storage capacity to carry the required load continuously for at least 4 hours in the event of a loss of all AC power without an accident ."

References:Tech Spec LCO 3.8.4 Basis
CFR 43.2
SRO #11

12. 057AA2.12 001/AOI-25.01/057AA2.12/3.5/3.7//2/BANK/1/1/
Given the following plant conditions:

- Unit 1 at 100% power
- Alarms received indicate a failed electrical board
- Other indications are:
  - All trip status lights out on 1-XX-55-5 Panel (1-M-5).
  - Low seal flow to RCP's due to FCV-62-89 failing open.
  - High charging flow due to FCV-62-93 failing open.

Which ONE of the following identifies which electrical board that was lost?

A. 120 VAC Vital Instrument Power Board 1-I.

B. 120 VAC Vital Instrument Power Board 1-II.

C. 125 VDC Vital Battery Board I.

D. 125 VDC Vital Battery Board II.

The correct answer is A

a. Correct - Loss of Board 1-I causes all reactor trip and SI status lights to go dark and causes 1-FCV-62-89 and 1-FCV-62-93 to fail open.
b. Incorrect - FCV-62-89 and FCV-62-93 do not fail open on loss of this board.
c. Incorrect - FCV-62-89 and FCV-62-93 do not fail open on loss of this board.
d. Incorrect - FCV-62-89 and FCV-62-93 do not fail open on loss of this board.

Reference:AOI-25.01, Loss Of 120V Vital Insturment Power Board 1-I, 3-OT-AOI2500
Bank AOI2500.01.03
CFR 43.5 / 45.13
SRO #12

13. 059G2.4.8 001/AOI-31 AND ES-0.1/059G2.4.8/3.0/3.7//2/NEW/1/1/YES
Given the following:

- WBN Unit 1 at 100%
- Relay testing in progress for "A" phase Main Bank transformer.
- All other conditions normal
- A Customer Group technician accidentally shorts the differential relay on "A" phase Main transformer.
- The unit trips and the crew enters E-0, "Reactor Trip or Safety Injection," then transitions to ES-0.1, "Reactor Trip Response."
- While performing ES-0.1 the Unit Operator announces alarm 180-B, ERCW Disch Hdr A 0-RM-133/140 Liq Rad Hi, in alarm.
- The Chemistry lab and Radcon are notified.

What other actions should the crew take?

A. Continue with ES-0.1 until the transition to the GO-5, "Unit Shutdown from 30% Reactor Power to Hot Standby."

B.✔ Continue with ES-0.1 while concurrently referring to AOI-31, "Abnormal Release of Radioactive Material."

C. Discontinue ES-0.1 and perform AOI-31, "Abnormal Release of Radioactive Material", to completion.

D. Discontinue ES-0.1 at step 12 and transition to AOI-31, "Abnormal Release of Radioactive Material."

The correct anwer is B

A. Incorrect: Per TI-12.04 "During performance of the ES-0.1, if plant conditions warrant" an AOI my be performed concurrently.

B. Correct: AOI 31 should be performed concurrently on a not to interfere basis.

C. Incorrect: Per TI 12.04, discontinuing ES-0.1 would be considered interfering with its performance.

D. Incorrect: Examinee may confuse permissable actions allowed after E-0 step 12.

Reference: TI-12.04 rev 2, section 2.8 paragraph 1, ARI-180B, AOI-31, ES 0.1
CFR 41.10, 43.5 / 45.13
SRO #13

14. 062AA2.03 002/AOI-13/062 AA2.03/2.6/2.9//2/BANK/1/1/YES
Given the following:

- 2-FI-67-61, 2A ERCW SUP HDR FLOW is indicating off scale high flow.
- Aux Bluilding Flood Alarms are lit.
- 2A Supply Header pressure reads 20 psig.
- ERCW HDR A SUP PRESS LO annunciator 223-A is in alarm.

Which ONE of the following ERCW headers will CCS heat exchanger 'A' be aligned to when the appropriate AOI steps are completed.

A. 1A

B. 1B

C. 2A

D. 2B

The correct answer is B
a. Incorrect - The only headers which can be aligned to the A CCS Ht Ex are 2A and 1B, 2A is the normal supply.
b. Correct - 1B is the alternate supply to the A CCS Ht Ex.
c. Incorrect - The only headers which can be aligned to the A CCS Ht Ex are 2A and 1B, 2A is the normal supply.
d. Incorrect - The only headers which can be aligned to the A CCS Ht Ex are 2A and 1B, 2A is the normal supply.

Reference: 3-OT-AOI1300, 3-OT-SYS067A, AOI-13
Bank: SYS067A.03.003
CFR 43.5 / 45.13
SRO #14

15. 067AK3.02 001/AOI-30.1/067 AK3.02/2.5/3.3//2/BANK/1/1/
Which ONE of the following describes why some ventilation systems may have to be shut down per Appendix A of AOI-30.1, "Plant Fires," when a fire occurs in their area?

A. ✔ Fire dampers may not fully close under normal ventilation flow conditions.

B. Enable Fire Ops to ventilate as needed for fire suppression.

C. Prevents overloading the electrical boards feeding these ventilation systems.

D. Allows the fire dampers to be opened manually for smoke removal.

The correct answer is A

a. Correct - Per Appendix A of AOI-30.1, the Incident Commander may shutdown fans after fire scene sizeup to ensure fire damper closure to maintain fire barrier integrity.
b. Incorrect - Fire ops may need to ventilate but this is later in the event and fans may be started to perform this.
c. Incorrect - This could be a valid reason to shut down fans but is not the reason in this event.
d. Incorrect - The examinee may confuse the purpose of fire dampers, they should isolate the fire area and are not used for smoke removal.

Reference: AOI-30.1 Appendix A; 3-OT-AOI3000
Bank: AOI3000.06.001
CFR 41.5,41.10 / 45.6 / 45.13
SRO #15

16. 068AK2.03 001/AOI-27/068 AK2.03/2.9/3.1//1/BANK/1/1/
Given the following plant conditions:

- MCR evacuation is required due to the presence of hazardous gases.
- Manual Reactor trip has been performed.
- Operators are performing AOI-27, "MCR Inaccessibility".

Which ONE of the following actions will be performed by the Control Room operators PRIOR to MCR evacuation?

A. Manually actuate Safety Injection.

B. Stop all RCPs and verify natural circulation.

C. Adjust SG PORVs and close all MSIVs.

D. Adjust Steam Dumps to control RCS temperature at 557°F.

The correct answer is C

a. Incorrect - The AOI designates actions to be taken by the MCR crew prior to leaving, the examanee may consider this as an action to be taken, it is not required per AOI-27.
b. Incorrect - This is not required for AOI-27 but it is required for an Appendix R fire when the MCR is evacuated so the examanee may consider this as appropriate.
c. *Correct* - AOI-27 requires the MSIV's to be closed and the PORVs adjusted prior to exitting the MCR.
d. Incorrect - The examinee could confuse using the steam dumps to control RCS temperature with using the PORVs.

Reference:AOI-27. section 3.1, 3-OT-AOI2700
Bank: AOI2700.04.01
CFR 41.7 / 45.7
SRO #16

17. 069AK1.01 001/T/S 3.6.1/069 AK1.01/2.6/3.1//1/INPO EXAM BANK/1/1/YES
Per Tech Spec Basis regarding high containment pressure, which ONE of the following events would lead to the HIGHEST pressure/leakage out of containment?

A.✔ Design Basis LOCA.

B. Design Basis Steam Line Break inside Containment.

C. Rod Ejection Accident.

D. Pressurizer vapor space LOCA.

The correct answer is A

A. *Correct* - TS Bases 3.6.1 "La is assumed to be 0.25% per day in the safety analysis at Pa=15.0 psig which bounds the calculated peak containment internal pressure resulting from the limiting design basis LOCA (Ref. 3)."

B. Incorrect- Per TS Bases 3.6.1, this is a DBA but not the limiting DBA.

C. Incorrect- Per TS Bases 3.6.1, this is a DBA but not the limiting DBA.

D. Incorrect- Not a DBA.

Reference: WBNP Tech Spec Bases Revision 10 amendment 5, B 3.6.1, Applicable Safety Analyses, Next to last sentence.
CFR 41.8 / 41.10 / 45.3
SRO #17

18. 074EK1.08 006/STEAM TABLES/074 EK1.08/2.8/3.1//2/NEW/1/1/
Given the following conditions:

- Performing FR-C.1, "Inadequate Core Cooling"
- Operators were successful at restoring ECCS flow.
- The RCS indicates 348°F and 131 psig on RVLIS.

Which one of the following describes the state of the RCS?

A.✔ Subcooled Liquid.

B. Saturated Liquid.

C. Super Heated Vapor.

D. Saturated Vapor.

The correct answer is A.

a. *Correct* - If no phase change then the fluid must have been subcooled.
b. Incorrect - If the fluid was saturated then there would have been a phase change when heat was added.
c. Incorrect - The vapor would not be super heated at this point.
d. Incorrect - The fluid would have had 100% quality if it had been a saturated vapor.

The examinee may misread the steam tables and arrive at any of the above alternatives.

Reference: Steam tables
CFR 41.8 / 41.10 / 45.3
K/A 074 EK1.08
SRO # 18

19. 076AA1.04 001/SYS090A/076AA1.04/3.2/3.4/NRC 1-26-02/1/BANK/1/1/
Which ONE of the following correctly describes the indication on the main steam line radiation monitors when the MR/HR AUTO pushbutton is lit on the RM-23 readout module?

A. Indicates low range output only.

B. ✔ Indicates high range output only.

C. Automatically switches between the low and high range outputs every 45 seconds.

D. Automatically switches between low and high range output based upon activity level in order to maintain accurate indication.

The correct answer is B.

a. Incorrect - high range only indication is provided since lo range has been set to zero.
b. *Correct* - high range only indication is provided since lo range has been set to zero.
c. Incorrect - high range only is provided. The C/S (check source) light will remain on during check source for 45 seconds
d. Incorrect - high range only is provided. The examinee may think the auto select is still functional however the low range has been set to zero therefore only the high range is indicated in AUTO.

REFERENCES: 3-OT-SYS090A
Bank 076AA1.04.001
CFR 41.7 / 45.5, 45.6
SRO #19

20. E01EA2.1 001/ES-0.1/E01 EA2.1/3.2/4.0//2/NEW/1/1/
Given the following conditions:

- Plant automatic trip and safety injection occurred due to containment high pressure.
- Lower Cntmt Radiation Monitor, 1-RM-90-106, is in alarm.
- The operating crew transistioned to E-2, "Faulted Steam Generator Isolation" due to the CRO misreading the #1 SG pressure.

Upon realizing the CRO's error, which ONE of the following identifies the correct transition that the Unit supervior should make from E-2, "Faulted Steam Generator Isolation?"

A. Transition back to E-0, "Reactor Trip or Safety Injection."

B. Transition to E-1, "Loss of Reactor or Secondary Coolant."

C. Continue in E-2, "Faulted Steam Generator Isolation", until completion.

D.✔ Transition to ES-0.0, "Rediagnosis."

The correct answer is D.

A. Incorrect - The examinee may feel that due to the error they can simply backtrack.
B. Incorrect - The examinee may feel that due to the error they can skip to the correct instruction.
C. Incorrect - Continuing in the wrong instruction will delay performance of the correct instruction.
D. *Correct* - Per TI-12.04 2.5.1, ES-0.0 is a unique instruction designed for this problem.

Reference: ES-0.1, TI-12.04
CFR 41.8 / 41.10 / 45.3
SRO #20

21. EO4EK3.3 001/ECA-1.1/EO4 EK3.3/3.8/3/8//1/NEW/1/1/YES
Given the following conditions:

- A LOCA outside containment has occurred.
- SI was manually actuated.
- The crew has completed ECA-1.2, "LOCA Outside Containment," and transistioned to ECA-1.1, "Loss of RHR Sump Recirculation."

What is the basis for resetting the SI interlock to RHR sump suction Auto-swapover, 1-HS-63-72D and 73D?

A. To prepare the plant for cooldown to cold shutdown.

B. To prevent damage to the SI pumps.

C. To prepare the RWST for refill from the containment sump.

D. To prevent inadvertent loss of RWST inventory due to automatic switchover.

The correct answer is D.

a. Incorrect - The examinee may confuse the urgency for cooldown with the need to perform this step.
b. Incorrect - The examinee may confuse where the SI pumps take suction.
c. Incorrect - The examinee may confuse the appendixes for cntmt spray recirc to RWST with this step.
d. Correct - Per the ERG's this is the correct purpose.

Reference: ECA-1.1, ERG, ECA-1.1
CFR 41.5/41.10, 45.6, 45.13
SRO #21

22. E06G2.4.10 002/FR-C.2/E06 G2.4.10/3.0/3.1//2/NEW/1/1/YES

Given the following plant conditions:

- Unit 1 has experienced a Small Break LOCA.
- RCS pressure is stable at 1535 psig.
- RCP's are shutdown
- RVLIS indicates 30%.
- Highest Core Exit T/C reading 601°F.
- Annunciatior window 91A PZR PORV/SAFETY OPEN is in alarm.
- The crew is performing FR-C.2, Response to Degraded Core Cooling.

Which ONE of the following is the response to the ARI?

A. Determine if PORV should be open per COMS setpoint and close block valve if the PORV should be shut.

B. Determine if PORV should be open per normal setpoint and close block valve if the PORV should be shut.

C. Determine if PORV should be open per COMS setpoint and remove the fuses which provide power to the PORV.

D. Determine if PORV should be open per normal setpoint and remove the fuses which provide power to the PORV.

The correct answer is B

A, C, D. Incorrect - The examinee must be able to determine that the COMS is not armed and the appropriate response, removing the fuses should cause the PORV to fail closed but the procedure calls for the block valve to be closed.
B. Correct

Reference: FR-C.2, ARI-91-A
E06 G2.4.10
CFR 41.10 / 43.5 / 45.13
SRO #22

23. E08EK1.3 001/FR-P.1/E08 EK1.3/3.5 / 4.0//2/BANK/1/1/YES
During the performance of FR-P.1, "Pressurized Thermal Shock", operators are allowed to terminate SI using less restrictive criteria than in other Emergency Operating Instructions.

Which ONE of the following describes why it is desirable to terminate SI during the performance of this procedure?

A. Minimizes temperature stratification in the loops allowing a more accurate indication of RCS temperature.

B. Minimizes RCS temperature drop and pressure rise due to excessive ECCS flow.

C. Allows RCS pressure to drop to saturation conditions to relieve pressure stresses on the reactor vessel.

D. Allows voids to form in the SG U-tubes to stop Natural Circulation and subsequent RCS cooldown.

The correct answer is B.

a. Incorrect - This could be a valid result of terminating SI flow but this is not the reason for doing so in FRP
b. Correct - For PTS concern the temperature drop and pressure rise are conditions which impact the severity of the event.
c. Incorrect - Reducing ECCS flow does not necessarily allow pressure to drop. This is a valid distractor due to discussing the pressure stress on the vessel.
d. Incorrect - plausible distractor due to discussing stopping subsequent RCS cooldown which would make the PTS condition worse.

References:3-OT-FRP0001, FR-P1
Bank FRP0001.02.001
CFR41.08 / 41.10, 45.3
SRO #23

24. E10EK2.2 002/ES-0.3/E10 EK2.2/3.6/3.9//1/BANK/1/1/YES
Which ONE of the following correctly identifies the bases for maintaining RVLIS level greater than 76% while performing ES-0.3, "NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL(WITH RVLIS)?"

A. ✔ Ensures upper head void remains above the top of the hot legs.

B. Ensures PZR level will remain on scale if the bubble collapses.

C. Limits the RCS pressure rise in the event an RCP is restarted.

D. Prevents fuel uncovery due to void collapse in the event of system repressurization.

The correct answer is A.

A. Correct - Per the ES-0.3 back ground documents.
B. Incorrect - The examinee may choose this due to other procedures requiring Prz level.
C. Incorrect - The examinee may choose this due to similar considerations in other procedures.
D. Incorrect - The examinee may choose this due to concern over fuel cover during this procedure, however this is not the basis.

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Reference: ES-0.3
Bank: audit 2
CFR 41.7 / 45.7
SRO #25

25. 008AK3.01 001/3-OT-TAA013/008 AK3.01/3.7/4.4//2/BANK/1/2/
Given the following conditions:

- The Unit was operating at 100% power.
- A reactor trip and SI have occurred on low pressurizer pressure.
- RCS pressure dropped rapidly to 1250 psig and is now rising slowly.
- Pressurizer level initially dropped to 15%, then rose rapidly to 100%.
- Containment radiation, moisture, and pressure are high.
- PRT conditions are normal.

Which ONE of the following describes the loss of primary coolant event that has taken place?

A. Pressurizer safety valve failed open.

B. Pressurizer surge line rupture.

C. Pressurizer spray line failure at the penetration weld.

D. Reactor head vent line rupture.

The correct answer is C.

a. Incorrect - The PRT conditions are normal so the event was not a safety valve failing open. This is a plausible distractor due to it is a vapor space break.
b. Incorrect - A surge line break would not cause the pressurizer level to rise to 100%,
c. *Correct* - This would be a vapor space break and would not cause the PRT conditions to change.
d. Incorrect - This is a valid distractor since it is a LOCA and the examinee must be able to differentiate between a vapor space break and a small break LOCA.

Reference:3-OT-TAA013
Bank EOP0100.012
CFR 41.5, 41.10 / 45.6 / 45.13
SRO # 25

26. 009EK2.03 001/TAA011/009 EK2.03/3.0/3.3//2/BANK/1/2/
Given the following conditions:

- The plant was operating near the end of the fuel cycle when a small LOCA occurred.
- The crew implemented the EOPs and are performing E-1, Loss of Reactor or Secondary Coolant.
- E-1 directs the operators to maintain intact SG levels at 10% - 50% NR.

Which ONE of the following describes why maintaining SGs as an available heat sink is important to the mitigation of small LOCAs?

A. Limits steam formation in the SG tubes.

B. Prevents RCS pressure from dropping to saturation pressure.

C. Limits RCS pressure rise if break flow is not sufficient to remove heat.

D. Prevents thermal shock to the SG tubes due to ECCS injection of cold water.

The correct answer is C.

a. Incorrect - cannot prevent steam formation the tubes as RCS depressurizes.
b. Incorrect - RCS will reach saturation during a small LOCA.
c. *Correct* - heat sink limits the RCS pressure increase when break flow does not provide adequate heat removal.
d. Incorrect - thermal shock would not be a problem in the presence of forced or natural circ during a small LOCA.

Reference: 3-OT-TAA013.01
Bank TAA013.01.001
CFR 41.7 / 45.7
3-OT-EOP0100
K/A 009 EK2.03
SRO # 26

27. 022AA1.08 001/ARI-109A/022 AA1.08/3.4/3.3//2/BANK/1/2/
Given the following plant conditions:

- Unit is operating steady state at 93% power.
- VCT LEVELHI/LO annunciator alarms on M-6.
- LI-62-129, VCT level, indicates 35% and is dropping (M-6).
- LI-62-130, VCT level, indicates 100% (ICS).

Which ONE of the following describes the expected plant response?

A. PZR level will drop to 17% resulting in letdown isolation and recovery of VCT level.

B. VCT level will continue to drop until the operator manually aligns Divert Valve, LCV-62-118, to the VCT position.

C. Auto makeup will initiate to the VCT when LI-62-129 drops to 20% and raise VCT level to 41%.

D. Suction to the operating CCP will automatically align to the RWST when VCT level drops to 7%.

The correct answer is B.

a. Incorrect - Pressurizer level will not drop, VCT level will drop due to diverting to HUT.This is a valid distractor because the pressurizer level could be effected due to the possibility of LOCA or low charging flow due to indicated VCT levels.
b. *Correct* - The VCT level will continue to drop due to LT-62-130 failing high which causes letdown to be diverted to the HUT and the suction will not swap over to the RWST unless both 62-130 and 62-129 indicate low.
c. Incorrect - 1-LT-62-130 failing high will prevent auto makeup.
d. Incorrect - Both 62-129 and 62-130 must be indicating <7% for the suction to swap to the RWST.

References:ARI-109-A, 3-OT-SYS062A
Bank: SYS062A.002
K/A 022AA1.08
CFR 41.7 / 45.5 / 45.6
SRO # 27

28. 025AK2.01 001/AOI-14/025 AK2.01/2.9/2.9//2/NEW/1/2/YES
Given the following plant conditions:

- Unit is in Mode 5 with a cooldown in progress.
- A train RHR is in service.
- B train RHR is available.

Which ONE of the following procedures should be entered if cooling cannot be established to either train of RHR heat exchangers?

A. AOI-13, "Loss of ERCW."

B. AOI-14, "Loss of Shutdown Cooling."

C. AOI-7 "Maximum Probable Flood" for implementation of SFP Cooling/RHR cooling.

D. SOI-70.01, "Component Cooling Water (CCS)".

The correct answer is B.

a. Incorrect - The examinee must recognize that CCS is cooling the heat exchanger not ERCW.
b. *Correct*: -The operator must recognize that a loss of CCS to the RHR heat exchangers, is a loss of residual heat removal.
c. Incorrect - Even though using the SFP cooling system is an option for core cooling, AOI-7 is not the correct procedure flow path.
d. Incorrect - Examinee may think that CCS can be realigned with SOI-70, however the AOI-14 takes priority.
Reference: AOI-14 section 3.7 and AOI-15 section 3.2 step 5.
CFR 41.7 / 45.7
K/A 025 AK2.01
SRO # 28

29. 027AK1.03 001/3-OT-GFET004/027AK1.03/2.6/2.9//2/MOD/1/2/
Given the following plant conditions:

- Unit was at 100% power.
- All systems operating in automatic and all plant parameters at their normal values.
- A malfunction of the Pzr pressure control has caused a PORV to open and then close back.
- The PORV is leaking with its block valve open.

Which ONE of the following identifies the approximate maximum expected temperature of the steam entering the PRT if the PRT pressure does not exceed 55 psig?

A. 228°F.

B. 267°F.

C. 287°F

D.✔ 303°F

The correct answer is D.

a. Incorrect - 228°F is the saturation temperature for normal operating condition of the PRT (5-7 psig). When the PRT pressurizes to 45 psig, the temperature of the steam being admitted will rise accordingly.
b. Incorrect - 267°F is the saturation temperature for 40 psia which is a logical mistake if the examinee subtracts 15 psi from 55 psig to convert to psia instead of adding 15 psi to 55 psig.
c. Incorrect - 287°F is the saturation temperature for 55 psia which is a logical mistake if the examinee does not convert to psia before using the steam table.
d. *Correct* - since this is an isenthalpic process temperature and pressure will be reduced dependent upon the PRT condition of 55 psig.

REFERENCES:3-OT-GFET004
Bank SYS068C 003
CFR 41.7 / 45.5 / 45.6
K/A 027AK1.03
SRO # 29

30. 032AA2.09 002/LP 3-OT-SYS92A/032 AA2.09/2.5/2.9//1/NEW/1/2/
Given the following:

- Unit 1 in mode 3 with startup in progress.
- The voltage output failed HIGH to source range monitor N132 detector.

Which ONE of the following regions of the gas-filled detector curve will N132 be operating in?

A. Continuous discharge.

B. Ionization.

C. Proportional.

D. Geiger-Mueller.

The correct answer is A.

a. *Correct* - With the high voltage setting failing high, mulitple avalanches will result thus causing a continuous discharge.
b. Incorrect - This is the normal range for the SRM.
c. Incorrect - A high failure will go beyond this range.
d. Incorrect - A high failure will go beyond this range.

Reference: Lesson Plan 3-OT-SYS092A
K/A 032 AA2.09
CFR 43.5 / 45.13
SRO 30

31. 037G2.4.2 002/AOI-33/037 G2.4.2/3.9/4.1//1/BANK/1/2/YES
Given the following plant conditions:

- Unit 1 is operating at 100% power.
- The crew is performing AOI-33, "SG Tube Leak".
- The OAC has fully opened 1-FCV-62-93 and 1-FCV-62-89 to maximize charging flow.
- PZR level is slowly dropping.

Which ONE of the following describes the action(s) that should be taken per AOI-33?

A. Trip the reactor, manually initiate SI and enter E-0.

B. Start the second charging pump to slow the loss of inventory.

C. Determine leak rate and commence a plant shutdown to meet Tech Spec LCO action time.

D. Commence rapid plant shutdown per AOI-39.

The correct answer is A

a. Correct - Step 3 of AOI-33, Steam Generator Tube Leak, if Pzr level continues to drop after maximizing charging, Then trip reactor and initiate SI.
b. Incorrect - The examinee may choose this since it would slow or stop the pzr level drop.
c. Incorrect - This is appropriate for a small leak.
d. Incorrect - This would be the correct action if the leak were small enough that the pzr level was not dropping after max charging established.

Reference: AOI-33, Steam Generator Tube Leak, 3-OT-AOI3300Bank AOI3300.04.007
41.7 / 43.5 / 45.13
SRO #31

32. 038EA1.08 001/E-3/038EA1.08/3.7/3.8//2/NEW/1/2/
Given the following plant conditions:

- Steam Generator Tube Rupture has occurred.
- Crew has implemented E-3, "Steam Generator Tube Rupture".
- The SRO has determined the target temperature to cooldown the RCS is 480°F.
- The RCPs are off due to a Loss of Offsite Power

Which ONE of the following identifies what is monitored to determine when to teminate the RCS cooldown?

A. Tavg from 1-TR-68 2B, AUCT HI TAVG

B. ✔ INCORE TCs HI QUAD AVG on the Core Cooling Monitor

C. The lowest Tcold from 1-M-5 Tcold board indications

D. Thot from the RVLIS page on the Core Cooling Monitor

The correct answer is B.

a. Incorrect - AUCT HI TAVG is used to monitor rod control and normal operations of the reactor.
b. *Correct* - The step is to cooldown to target incore temperature and the core cooling monitor is used to determine when the RCS has been cooled down.
c. Incorrect - When RCPs are off Tcold is used to monitor RCS temperature per E-0 not for cooling down in E-3
d. Incorrect - T hot is indicated on the core cooling monitor but it is not used for the target temperature.

REFERENCES: E-3; 3-OT-EOP0300
K/A 038 EA1.08
CFR 41.8,41.10/45.3
SRO # 32

33. 054AA2.08 003/AOI-38/054 AA2.08/2.9/3.3//1/NEW/1/2/YES
Given the following conditions:

- The unit is at 78% power.
- #3 SG level is dropping.
- The steam flow, feed flow, chart recorder for #3 SG indicates feed flow is dropping and #3 SG steam flow is unchanged.
- It's also noted that hotwell level is dropping.

What accident has occurred?

A. Steam Line break

B. Feedwater Line break

C. A Main Feedwater Pump has tripped.

D. The MFWRV for #3 SG is malfunctioning.

The correct answer is B

a. Incorrect - The examinee may consider this since the hotwell level is dropping.
b. Correct - With the hotwell level dropping and feed flow dropping this is a feed line break.
c. Incorrect - The examinee may pick this due to the feed flow dropping and the flow mismatch.
d. Incorrect - The examinee may pick this due to the SG level drop and the flow mismatch.

Reference: AOI-38, 3-OT-AOI3800
CFR 41.7
SRO 33

34. 060AK1.02 002/RAD0003/060 AK1.02/2.5/3.1//2/BANK/1/2/
A waste gas decay tank valve has a packing leak. Given the following :

- Airborne activity - 3 DAC
- Radiation level - 40 mrem/hr.
- Radiation level with shielding - 10 mrem/hr.
- Time to place shielding - 15 minutes.
- Time to conduct task WITH respirator - 1 hour.
- Time to conduct task WITHOUT respirator - 30 minutes.

Assumptions:

- The airborne dose with a respirator will be zero.
- A whole body dose rate of 40 mrem/hr will be received while placing the shielding.
- All tasks will performed by one worker.
- Shielding can be placed in 15 minutes with or without a respirator.

Which ONE of the following would result in the least amount of radiological effect to the person performing the work?

A. Conduct task WITHOUT respirator or shielding.

B. Conduct task WITH respirator and WITHOUT shielding.

C. Place shielding while wearing respirator and conduct task WITH respirator.

D. Place shielding while wearing respirator and conduct task WITHOUT respirator.

The correct answer is D.

3 DAC x 2.5 mrem = 7.5 mrem

a. Incorrect - 20 mrem (conduct task) + 3.75 mrem (airborne) = 23.75 mrem.
b. Incorrect - 40 mrem (conduct task) + 0 mrem (airborne) = 40 mrem.
c. Inc*orrect* - 10 mrem (place shielding) + 10 (conduct task) + 0 mrem (airborne) = 20 mrem.
d. Correct - 10 mrem (place shielding) + 5 mrem (conduct task) + 3.75 mrem (airborne) 18.75 mrem.

Reference: RAD0003
Bank:RAD0003.01.002
CFR 41.8/41.10/45.3
SRO # 34

35. 060AK3.02 001/SYS030A/060 AK3.02/3.3/3.5//2/NEW/1/2/
Given the following conditions:

- Reactor is critical at 1% power.
- Fuel assemblies and inserts are being shuffled in the Spent Fuel Pit (SFP).
- The following alarms are received and validated in the MCR:
  - SFP 0-RM-90-102/103 RAD HI
  - 1-RR-90-1 AREA RAD HI
- The operator verified ABGTS in service and the area has been evacuated.

Which ONE of the following describes additional verification of Auxiliary Building ventilation equipment that the operator should perform?

A. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans running.

B. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans off.

C. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans running.

D. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans off.

The correct answer is D.

a. Incorrect - AB General Supply and Exaust and FH Exhaust fans will be off.
b. Incorrect - AB General Supply and Exaust and FH Exhaust fans will be off.
c. Incorrect - AB General Supply and Exaust and FH Exhaust fans will be off.
d. *Correct* - AB General Supply and Exaust and FH Exhaust fans will be off.

Reference: SYS030A.07
K/A 060 AK3.02
CFR 41.5,41.10/45.6/45.13
SRO # 35

36. 061G2.3.4 002/EPIP-15/061 G2.3.4/2.5/3.1//2/MOD/1/2/

Given the following conditions:

- Unit 1 was operating at 85% power.
- The pressurizer sample line has broken in the Hot Sample Room and cannot be isolated from containment due to failed containment isolation valves.
- The crew is unable to isolate the leak from the main control room.
- The Auxiliary Building AUO has volunteered to close the local isolation valve which is in the sample room.
- 1-RM-90-7, Sample Room Area Rad Monitor, indicates that the radiation level is 80 R/hr.
- Estimated time to close the valve is 20 minutes.
- The Site VP has assumed the position of SED.

Who can authorize the Auxiliary Building AUO to shut the valve?

A. Plant Manager.

B. Rad Con Manager.

C. Site Emergency Director.

D. No one, evolution not permitted.

The correct answer is D.

a. Incorrect - The examinee may expect the plant manager can over rule in an emergency.
b. Incorrect - The examinee may feel that the Rad Con Manager can raise the TEDE limit.
c. Incorrect - The examinee may expect the SED can over rule in an emergency.
d. *Correct* - No one can authorize greater than 25 rad.

Reference:EPIP-15
Bank - PCD048C.042
CFR - 43.4/45.10
K/A 061 G2.3.4
SRO # 36

37. 061AK2.01 001/3-OT-SYS090A/061 AK2.01/2.5/2.6//1/NEW/1/2/
Which ONE of the following will cause an instrument malfunction alarm on MCR Area radiaition monitor 0-RM-90-135?

A. Sample vacuum abnormal.

B. Loss of voltage to the ratemeter.

C. Filter trouble.

D. Monitor exceeds high alarm setpoint.

The correct answer is B.

a. Incorrect - This is an instrument malfuntion alarm for a process monitor (e.g. 0-RM-90-125, MCR intake rad monitor)
b. *Correct* - This is a cause of the alarm
c. Incorrect - This would be correct for RM-90-125 or 90-126, not for an area monitor.
d. Incorrect - The monitor exceeding the high setpoint will cause a high rad alarm and not an instrument malfunction.

Reference:3-OT-SYS090A
ARI186-D
K/A 061 AK2.01
CFR 41.7/45.7
SRO # 37

38. E03EK1.1 002/E-1/E03EK1.1/3.4/4.0//2/BANK/1/2/YES
Given the following:

- Reactor trip and SI occurred due to a small break LOCA.
- Crew progressed through the EOPs to the point of resetting SI and stopping the RHR pumps.
- RCS pressure is 1600 psig and stable.
- RCS saturated.
- Pzr level offscale LOW.

Which ONE of the following identifies when the RHR pumps would be required to be restarted during this event?

A. Foldout page SI reinitiation criteria is met.

B. RCS pressure drops to 370 psig.

C. RCS pressure drops to 150 psig.

D. Offsite power is lost and shutdown boards energized by DG.

The correct answer is C.

a. Incorrect - may be met however the RHRPs would not pump into the RCS at this pressure.
b. Incorrect - would not pump into the RCS at this pressure when aligned to RWST. This is the pressure at which RHR may be placed in service during normal conditions.
c. *Correct* - this pressure is below the shutoff head of the RHR pump and it would be started.
d. Incorrect - would only need to be restarted in this instance if they had been running (note in EOPs reminds operator of this).

Reference: E-1
Bank EOP0100.003
CFR 41.8 / 41.1 / 45.3
SRO #38

39. E05G2.4.41 001/EPIP-1/E05G2.4.41/2.3/4.1//2/NEW/1/2/YES
Given the following conditions:

- The 1A AFWP is tagged for seal replacement.
- The plant tripped due to an electrical fault on the main generator.
- The crew has has completed E-0, Reactor Trip or Safety Injection and transistioned to ES-0.1 Reactor Trip Response.
- 5 minutes later 1B AFW pump trips on over current due to an electrical cord from the 1A AFW pump work wrapping around the shaft.
- The TD AFW pump fails to start due to a short in the trip and throttle valve.
- The following steam generator narrow range levels are noted:
  SG 1 at 5%
  SG 2 at 9%
  SG 3 at 8%
  SG 4 at 7%

Using EPIP-1 which ONE of the following will be the correct REP classification?

A. Unusual Event.

B. Alert.

C.✔ Site Area Emergency.

D. General Emergency.

The correct answer is C

A. Incorrect - The examinee may choose this due to a lack of understanding of REP classification.
B. Incorrect - The examinee may choose this due to missing the OR startment for the 2 conditions
C. *Correct* - Loss of heat sink causes a potential loss of Fuel Clad and RCS Barriers
D. Incorrect - The examinee may choose this due the seriousness of the event.

Reference: EPIP-1, FR-0
CFR 43.5/45.11
SRO # 39

40. E11EA2.2 001/ECA1.1/E11 EA2.2/3.4/4.2//2/NEW/1/2/YES
Given the following plant conditions:

- Unit 1 tripped due to a Large Break LOCA.
- Containment pressure =1.5 psig.
- RWST level = 20%.
- Containment Emergency Sump level = 15%.
- RHR Swapover to the Containment Sump could not be performed.
- The operating crew has transitioned to ECA - 1.1, "Loss of RHR Sump Recirculation."
- The crew is performing step 3 of ECA - 1.1, "Loss of RHR Sump Recirculation", to determine the proper Containment Spray pump alignment and operation.

Which ONE of the following actions will result in the Containment Spray pumps being in the proper alignment under the existing plant conditions?

A. Leave both Containment Spray pumps running until RWST level $\leq$ 8%.

B. Stop both Containment Spray pumps and place handswitches in "pull-to-lock."

C. Stop one Containment Spray pump and allow the remaining pump to take suction from the RWST.

D. Stop both Containment Spray pumps, until suction can be aligned to the Containment Sump, then restart one pump.

The correct answer is B

a. Incorrect - The examinee may confuse the criteria listed in the table.
b. *Correct* - According to step 3 of ECA 1.1 if < 2.0 psig both CSS pumps are placed in Pull to Lock.
c. Incorrect - The examinee may confuse the criteria listed in the table.
d. Incorrect - The examinee may confuse the criteria listed in the table.

References: ECA-1.1, 3-OT-ECA0101
CFR 43.5/45.13
K/A E11 EA2.2
SRO # 40

41. 028AA2.11 002/3-OT-SYS068C/028 AA2.11/3.2/3.6//2/BANK/1/3/
Given the following:

- Unit 1 is steady-state at 100% power, with all controls in automatic
- Pressurizer level control channel selector switch is in the LT-68-339 & 335 position.
- LT-68-320 failed LOW and ALL required actions of AOI-20 were completed prior to shift turnover.
- The sealed reference leg for LT-68-335 ruptures.

Which ONE of the following describes the plant response? (Assume NO operator actions)

A. Backup Heaters energize.

B. Charging flow reduces to minimum.

C. Letdown isolation valve FCV-62-70 closes.

D. Reactor trip signal is initiated.

The correct answer is D

a. Incorrect - The interlock which caused the backup heaters to energize when there is a 5% level deviation has been removed so this could be choosen by the examinee but it is incorrect.
b. Incorrect - The examinee may choose this thinking that a high level will cause the charging flow to automatically be reduced, the failed channel is not controlling.
c. Incorrect - If the level were to fail low then this would be the correct answer
d. *Correct* - With the 320 channel bystables tripped the reference leg failure result in indicated level going to 100% and causing a reactor trip on 2 out of 3 high level.

Reference: 47W611-99-1; 3-OT-SYS068C
Bank SYS068B 001
CFR 43.5 / 45.13
K/A 028 AA2.11
SRO #41

42. 056G2.4.21 002/ES 0.2/056 G2.4.21/3.7/4.3//2/BANK/1/3/YES
The plant has had a reactor trip and a Loss of Offsite Power with 1 rod stuck out at 228 steps.

According to ES-0.1 Reactor Trip Response, which ONE of the following combinations of parameters correctly describes characteristics of adequate natural circulation flow?

A. RCS subcooled, SG pressure stable, T-hot stable, incore thermocouples stable, T-cold at saturation for SG pressure.

B. RCS subcooled, SG pressure dropping, T-hot rising, incore thermocouples dropping, T-cold at saturation for SG pressure.

C. RCS saturated, SG pressure dropping, T-hot rising, incore thermocouples dropping, T-cold subcooled.

D. RCS subcooled, SG pressure stable, T-hot fluctuating, incore thermocouples rising, T-cold subcooled.

The correct answer is A
a. Correct - This lists the correct variables and the trends.
b, c, d. Incorrect - The examinee must recognize the appropriate paramaters and the trends of each, the distractors have at least one wrong value.

Reference:ES 0.2, 3-OT-EOP0000
Bank EOP0000.10.001
CFR 43.5 / 45.12
SRO # 42

43. E13EK2.1 001/LP 3-OT-SYS001A/E13 EK2.1/3.0/3.1//2/BANK/1/3/
Given the following:

- Reactor trip has occurred.
- MSIV's are closed.
- The crew determines that #3 steam generator PORV has a blown fuse to the 125V DC solenoids.

Which ONE of the following correctly describes how Steam Generator #3 will be protected from an overpressure condition?

A. The PORV would require manual control from the local control station.

B. The PORV would fail CLOSED and pressure control will be via the SG safeties.

C. The PORV would respond to the pressure controller output and open if plant conditions required.

D. The PORV would NOT respond to the pressure controller output, but it would fully open if the pressure switch setpoint was reached.

The correct answer is C.

A. Incorrect - The 125v DC solenoids energize to admit air to the PORV for it to open.
B. Incorrect - The PORV has several parallel methods to open it, the loss of 125v DC simply removes the "pop open" function.
C. *Correct* - Due to it's design the AC powered controller in the MCR would still operate the PORV.
D. This statement is true concerning the MCR controller. But not true for the 125v DC.

Reference: 1-47W611-1-1, 1-47W600-1-4, LP 3-OT-SYS001A
Bank: SYS001A.12.001
CFR 41.8/41.10,45.3
K/A E13 EK2.1
SRO # 43

44. 001A2.16 002/AOI-2/001A2.16/3.4/4.0//2/NEW/1/2/YES
While recovering a dropped rod from D Bank per AOI-2, the plant is in the following condition:

- Bank D rods are at 220 steps
- Reactor Engineering has allowed a maximum power of 80% while retrieving the rod.
- The dropped rod has been withdrawn to 150 steps.
- Reactor power and turbine load rise to 80%.
- The lift coils to all rods in D bank have been reconnected
- The Control Rod Selector Switch has been placed in the appropriate position per AOI-2 to reduce turbine load to 75%.

Which ONE of the following identifies the position of the Control Rod Selector Switch and the consequence of not resetting the CONTROL ROD URGENT FAILURE alarm prior to the load reduction?

A. Manual	Only one group of rods would move in Bank D .
B. Bank Select for Bank D	Only one group of rods would move in Bank D.
C. Manual	None of the rods in Bank D would move.
D. Bank Select for Bank D	None of the rods in Bank D would move.

The correct answer is A.
A. Correct - The rods are placed in manual and the turbine load reduced to <75%. One one group of rods would move due to a power cabinet causing the Urgent Failure.
B. Incorrect - The rods would not be placed in bank select, they would have to be in manual.
C. Incorrect - One group of rods in Bank D would move.
D. Incorrect - One group of rods in Bank D would move and the rods would be placed in manual.
Reference AOI-2, 3-OT-SYS085, 3-OT-AOI0200
CFR 41.5 / 43.5 / 45.3 / 45.13
SRO #44

45. 003K6.02 002/AOI-24, AOI-5/003 K6.02/2.7/3.1//2/NEW/2/1/YES
The plant is operating at 100% power when operators observe the following:

- #1 Seal leakoff for RCP #2 is .5 gpm.
- The RCP lower bearing temperature is rising.
- Standpipe level alarm is DARK.
- The Reactor is tripped at 0259.
- The RCP is tripped at 0300.

Which ONE of the following lists the latest time allowed before seal return from the RCP should be isolated and which procedure is the crew currently implementing?

A. 0302

B. 0303

C. 0304

D. 0305

The correct answer is D.

a. Incorrect - Examinee may confuse time with tripping the reactor, this would be the minimum time.
b. Incorrect - This is the minimum time required to close the leakoff.
c. Incorrect - Examinee may confuse time with tripping the reactor, this would be the maximum time.
d. Correct - 5 minutes from the time the RCP is tripped.

References:AOI-24, AOI-5, 3-OT-AOI2400
CFR 41.7/45.5
K/A 003 K6.02
SRO # 45

46. 004K4.08 001/SYS062A/004 K4.08/2.8/3.2//1/BANK/2/1/
Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H2 Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between 15 psig and 30 psig when the plant is at power?

A. Ensures adequate NPSH for the CCPs if both start simultaneously.

B. Provides backpressure in CCP miniflow line to prevent excessive flow.

C. Provides backpressure to the #2 RCP seal to ensure adequate flow to #3 seal.

D. Ensures Hydrogen concentration in the RCS controlled at 25-50 cc/kg for oxygen scavenging.

The correct answer is D.

a. Incorrect - minimum level in the VCT ensures adequate NPSH.
b. Incorrect - orifices are provided in the miniflow lines to prevent excessive flow.
c. Incorrect - actually provides backpressure to the #1 seal.
d. *Correct* - partial pressure of hydrogen gas in the VCT controls hydrogen concentration in the RCS.

Reference: 3-OT-SYS062A, SOI-62.01
Bank: SYS62A.11.004
CFR 41.7
K/A 004 K4.08
SRO #46

47. 013K2.01 001/SYS099A/013K2.01/3.6/3.8/NRC 1-26-02/2/BANK/2/1/
Given the following plant conditions:

- The operating crew is responding to a reactor trip due to a loss of 120V AC Vital Instrument Power Bd I.
- PZR pressure transmitter 68-334 (Channel II) failed LOW.

Which ONE of the following describes the plant response?

A. Both trains of SSPS SI master relays would actuate AND both trains of ECCS equipment auto start.

B.✓ Both trains of SSPS SI master relays would actuate BUT only "B" train ECCS equipment auto start.

C. Only the "B" train SSPS SI master relays would actuate BUT both trains of ECCS equipment auto start.

D. Only the "B" train SSPS SI master relays would actuate AND only "B" train ECCS equipment auto start.

The correct answer is B.

a. Incorrect - Master relays would actuate since they are fed by the power supplies to the logic bay but slave relays for train A ECCS equipment cannot energize to actuate. Examinee may think the safeguards panel has redundant power supplies also.
b. C*orrect* - Both trains of master relays will actuate since they are fed by the redundant power supplies of the logic bay, but A train ECCS will not start since only channel I supplies power to the safeguards panel to actuate A train slave relays.
c. Incorrect - Examinee may be confused as to which relays have redundant power supplies. May think the master relays do not have redundant power supplies the slave relays do.
d. Incorrect - Examinee may confuse the power supplies of master relays and think they are powered by the same power supply as the safeguards panel.

REFERENCES:Lesson plan 3-OT-SYS099A OTT-3
Bank SYS099A.011
CFR 55. 41.5/43.5/45.3, 45.5
SRO # 47

48. 014K5.01 001/INPO BANK/014 K5.01/2.7/3.0//2/INPO EXAM BANK/2/1/
Which ONE of the following accurately compares/contrasts the Rod Position Indication (RPI) System with the Bank Demand Position Indication System (step counters)?

A.✔ The step counters are considered to be very accurate but not reliable. By comparison the RPIs are considered to be very reliable but not accurate.

B. The step counters are considered to be very reliable but not accurate. By comparison the RPIs are considered to be very accurate but not reliable.

C. The reliability of the RPIs and step counters are comparable but the step counters are more accurate than the RPIs.

D. The accuracy of the RPIs and step counters are comparable but the RPIs are more reliable than the step counters.

The correct ansower is A.

A. Correct - the step counters use actual demand pulses sent to the rods, however they do not see actual rod position, where the RPI's use proximity coils to determine actual approximate position.
B. Incorrect - The candidate may choose this due to confusing the two systems.
C. Incorrect - The candidate may choose this due to lack of understanding how the 2 systems compare. The RPIs and Step Counters are not comparable since they look at different parameters.
D. Incorrect - The candidate may choose this due to lack of understanding how the 2 systems compare. The RPIs and Step Counters are not comparable since they look at different parameters.

Reference: 3-OT-SYS085A, INPO Exam Bank
CFR 41.5/45.7
K/A 014 K5.01
SRO # 48

49. 015A1.04 001/3-OT-SYS092A/015 A1.04/3.5/3.7//2/MOD/2/1/
The following readings were taken from the Power Range NIS Detectors:

	N41	N42	N43	N44
Det. A (upper)	375.0	340.0	365.0	350.0
Det. B (lower)	345.0	345.0	330.0	360.0

All readings are in microamperes. The Rt and Rb constants from the detector calibration data for all the detectors are all 1.0. Select the detector with the most limiting Quadrant Power Tilt Ratio (QPTR).

A. N41 upper.

B. N42 upper.

C. N43 lower.

D. N44 lower.

The correct answer is A.

a. *Correct*
b, c, & d Incorrect, the QPTR for upper and lower must be calculated and the distractors are possible answers due to being the max or min value of the upper or lower detectors which are not correct.

References:3-OT-SYS092A objective 28, 1-SI-0-21, EXCORE QPTR & AXIAL FLUX DIFFERENCE
Bank: SYS092A.19.007
CFR 41.5/45.5
K/A 015 A1.04
SRO # 49

50. 017K4.03 001/SYSTEM DISCRIPTION/017 K4.03/3.1/3.3//1/NEW/2/1/
The maximum output of the ICTC, Incore Thermocouple Plasma Display is:

A. 593 degrees F

B. 727 degrees F

C. 1200 degrees F

D.✔ 2300 degrees F

The correct answer is D

A. Incorrect - Examinee may confuse 630 degrees which is the max T-Hot.
B. Incorrect - Examinee may confuse 727°F which is core cooling red with low RVLIS
C. Incorrect - Exminee may confuse 1200°F which is the SACRG-1 entry condition and core cooling red.
D. *Correct* - Per system description, "The range of the display will be 200°F to 2300°F."

Reference: System discription, N3-94-4003, 3.2.1.4
CFR 41.2 to 41.9 / 45.7 / 45.8
K/A 017 k4.03 [3.1/3.3]
SRO # 50

51. 022K4.03 002/3-OT-SYS030C/022 K4.03/2.6/2.7//1/BANK/2/1/
Which ONE of the following Containment Cooling System fans will trip as a DIRECT result of a ØA Containment Isolation signal?

A. Lower compartment coolers.

B. Upper compartment coolers.

C. CRDM cooler.

D. Incore Instrument room cooler.

The correct answer is D.
a,b,c. Incorrect - These coolers are tripped for a phase B signal, the examinee could mistaken any of these as being tripped by a phase A isolation signal.
d. Correct - This cooler is tripped by a phase B signal.

Reference: 3-OT-SYS030C
Bank SYS030C.05.02
CFR 41.7 / 45.6
SRO 51

52. 025G2.1.14 001/SOI-61.01 P&L A/025G2.1.14/2.5/3.3//1/NEW/2/1/
During the removal of a clearance on an ice condenser air handling unit, the AUO must use a ladder to unisolate the glycol near the top of the air handling unit, (about 10 feet from the floor).

Who must be notified before accessing the valve.

A. Operations

B.✔ Rad Con

C. Chem Lab

D. Mechanical Maintenance

The correct answer is B.

A. Incorrect - Operations has already authorized removal of the clearance.
B. *Correct* - Per SOI 61.01 P&L A. "Rad Con should be notified of work having the potertial to change radiological condtions." General RWP's allow work no greater than 6 feet from floor level. Otherwise notify radcon.
C. Incorrect - Examinee may think this is correct for glycol purity concerns.
D. Incorrect - Examinee may think that due to the clearance that permission may be needed from mechanical maintenance.

Reference: SOI 61.01 Precautions and Limitations A, GET LP RWT010
K/A 025G2.1.14
CFR 43.5 / 45.12
SRO # 52

53. 025K3.01 001/3-OT-SYS061A/025 K3.01/3.8/3.8//2/NEW/2/1/
Given the following plant condition:

- Unit 1 is at 100% power following a refueling outage.
- During the outage boric acid normally used for RCS make up was used for making ice for the ice condenser instead of sodium tetra borate.

Which ONE of the following describes the effect this would have on the containment in the event of a LOCA?

A. The pH in the containment sump would be higher causing less iodine to remain in solution.

B. The pH in the containment sump would be higher causing more corrosion of equipment in containment.

C. The pH in the containment sump would be lower causing less iodine to remain in solution.

D. The pH in the containment sump would be lower causing excessive iodine to remain in solution.

The correct answer is C.

A. Incorrect - The examinee may misunderstand that without sodium terta borate the pH will be lower.
B. Incorrect - The examinee may misunderstand that without sodium terta borate the pH will be lower and the result would not be corroding but scaling.
C. Correct - Sodium tetra borate raises the pH to keep iodine in solution.
D. Inc*orrect* - The examinee may misunderstand that the sodium raises sump pH to keep iodine in solution.

Reference: 3-OT-SYS061A
CFR 41.7/45.6
K/A 25 K3.01
SRO # 53

54. 026G2.2.9 001/SPP-9.4/026G2.2.9/2.0/3.3//2/NEW/2/1/YES
Given the following plant conditions:

- The Unit is at 100% power.
- 1-SI-72-901-A, CS Pump 1A-A Quarterly Performance Test is being performed.
- CSS flow transmitter 1-FT-72-34 failed HIGH

In response to the failure, which ONE of the following will require a safety evaluation?

A. A non-intent procedure change to 1-SI-72-901-A is submitted to clarify a step.

B.✔ A temporary alteration is required to replace the transmitter which will be in place until the next refueling outage, scheduled for 6 months from now.

C. The 1-SI-72-901-A acceptance criteria is not met.

D. Post maintenance test is required to be performed on 1-FT-72-13 prior to returning channel to service.

The correct answer is B.

a. Incorrect - Examinee may confuse that SPP-2.2 minor changes to procedures do not require 50.59 screening.
b. *Correct* - per SPP-9.4 a temporary alteration which is in place for greater than 90 days is required to have a safety evaluation in accordance with10CFR50.59.
c. Incorrect - Examinee may think that more than the LCO for CSS one train inoperable is entered and the applicable LCO actions are to be completed.
d. Incorrect - Examinee may confuse that SPP-9.4 maintenance activities are not required to be reviewed under 10CFR50.59.

REFERENCES: SPP-9.4, SPP-2.2
K/A 026 2.2.9
CFR 43.3 / 45.13
SRO # 54

55. 056A2.04 002/AOI-16, AOI-37/056A2.04/2.6/2.8//2/NEW/2/1/YES
Given the following conditions:

- The plant is operating at 100% power.
- 1A #3 heater drain tank pump (HDTP), trips.

Immediately after the trip how will the secondary flows respond and what procedure is appropriate?

A. # 7 HDTP flow drops, # 3 HDTP flow drops, Condensate flow rises (FE-2-35), use AOI-16, Loss of Normal Feedwater.

B. # 7 HDTP flow rises, # 3 HDTP flow drops, Condensate flow rises (FE-2-35), use AOI-37, Turbine runback response.

C. # 7 HDTP flow drops, # 3 HDTP flow rises, Condensate flow drops (FE-2-35), use AOI-37, Turbine runback response.

D. # 7 HDTP flow rises, # 3 HDTP flow rises, Condensate flow drops (FE-2-35), use AOI-16, Loss of Normal Feedwater.

The correct answer is B.

A. Incorrect - The examinee may confuse the reaction of #7 HDT system to a rise in condensate flow, and feel that the resulting low header pressure will require the use of AOI-16.

B. Correct - If flow is lost in the #3 HDT system, #7 HDT system and condensate flows will rise to attempt to fill the needs of the feedwater system, however due to the drop in #3 HDT flow a runback will take place and AOI-37 will be in effect.

C. Incorrect - The examinee may feel that the reduction in #3 HDT system head pressure will result in the other 2 pumps raising flow and confuse the reaction of the #7 HDT system.

D. Incorrect - The examinee may feel that the reduction in #3 HDT system head pressure will result in the other 2 pumps raising flow and confuse the the proper AOI and condensate flow at FE 2-35.

Reference: AOI-16, AOI-37
K/A 056A2.04
CFR 41.5/43.5/45.3/45.13
SRO #55

56. 059A3.04 001/SYS003/059A3.04/2.5/2.6//2/MOD/2/1/
Given the following plant conditions:

- The unit is operating at 75% power
- The controlling #1 S/G pressure transmitter fails HIGH.

Which ONE of the following describes the effect this will have on indicated steam flow and the response of the Main Feed Pump governor valves?

	Indicated Steam Flow	Governor Valve Response
A.	Drop	Governor Valve will open
B.	Drop	Governor Valve will close
C.✔	Rise	Governor Valve will open
D.	Rise	Governor Valve will close

The correct answer is C.

a. Incorrect - indicated flow will rise, however the governor valve will open.
b. Incorrect - The examinee may confuse the effect of loss of density compensation and choose this one.
c. *Correct* - indicated steam flow will fail in the same direction as the controlling S/G pressure transmitter because the pressure transmitter provides density compensation to the steam flow signal. Higher pressure translates into higher density of the steam which in turn means higher steam flow. The governor valve control system will try to match higher steam flow.
d. Incorrect - the governor valve will actually open. Examinee may confuse the effect with feedwater reg. valve operation.

REFERENCES: 3-OT-SYS003A
Bank: SYS003A.003
CFR 41.7/45.5
K/A 059A3.04
SRO # 56

57. 061K2.01 001/SOI-3.02/061 K2.01/3.2/3.3//1/NEW/2/1/
1-FCV-3-116A, ERCW Hdr A AFW Pmp 1A-A suction, is powered from which board?

A. 480 v Turbine MOV 1A

B. 480v Aux Bldg Common Board Bus A

C. 480v Shutdown Board 1A2-A

D. 480v Rx MOV Board 1A2-A

The correct answer is D.

A. Incorrect - Examinee may think power is from unit power.
B. Incorrect - Examinee may think power is from common power.
C. Incorrect - Examinee may think power is from Shutdown board.
D. *Correct* - Power is from 480v Rx MOV board.

Reference: SOI 3.02
CFR 41.7/45.5
K/A 061 K2.01
SRO # 57

58. 063A4.02 002/ARI-17A/063A4.02/2.8/2.9//1/NEW/2/1/
If the 125V DC bus 1 voltage drops to 105V, as read on 1-M-1 meter 1-EI-5-96, which ONE of the following describes the response of the UV Relay on the Battery feed to Battery Board 1 ?

A. It trips the charger to separate the battery from the faulted supply.

B. ✓ It actuates the 125 DC VITAL CHGR/BATT 1 ABNORMAL annunciator

C. It actuates the 125 DC VITAL BATT BD 1 ABNORMAL CKTS ISOLATED annunciator.

D. It trips the 125V DC Battery 1 supply breaker to Battery Board 1 to separate the battery from the faulted supply.

The correct answer is B.

A. Incorrect - Examinee may think the relay is to protect the board and would isolate the source of a potential problem.
B. *Correct* - Refer to ARI-17-A
C. Incorrect - Examinee may confuse which annunciator will alarm
D. Incorrect - Examinee may think the relay is to protect the board and would isolate the source of a potential problem.

References:ARI 17-A, ARI 17-B, MI-236.010
CFR 41.7/45.5 to 45.8
K/A 063A4.02
SRO # 58

59. 068K1.07 001/ARI-88B, 3-OT-SYS62A/068K1.07/2.7/2.9//2/NEW/2.1/
Given the following conditions:

- The plant tripped due to an inadvertent safety injection.
- The operator is responding to a PRT LEVEL HI/LO 88-B alarm.

What is the possible cause of this alarm?

A. Containment temperature rise due to loss of lower compartment coolers.

B. Normal leak-off from the #3 RCP seal.

C. Seal return via a relief valve.

D. Isolation of the PRT to the waste gas header.

The correct answer is C.

A. Incorrect - The examinee may confuse a phase A with a phase B signal.
B. Incorrect - The examinee may confuse the PRT with the RCDT.
C. *Correct* - Phase A will isolate the CVCS seal return and lift a relief valve to the PRT.
D. Incorrect - The examinee may think that the PRT is normally connected to the waste gas header, which is a manual operation.
Reference: ARI-88B, 3-OT-SYS62A
CFR 41.2 to 41.9/45.7 to 45.8
SRO # 59

60. 071K3.04 001/3-OT-SYS077B/071 K3.04/2.7/2.9/NRC 1-26-02/2/BANK/2/1/
Given the following plant conditions:

- A Gas Decay Tank release in progress with ABGTS running for dilution air flow.
- A leak occurs on the waste gas compressor which results in a gas release to the Auxiliary Building.
- 0-RE-90-101, Auxiliary Building Vent Monitor, is in alarm.

Which ONE of the following indicates the effect this leak will have on the plant? (Assume no operator action)

A. Gas Decay Tank release will be terminated; ABGTS will be stopped.

B. Gas Decay Tank release will be terminated; ABGTS will continue to run.

C. Gas Decay Tank release will continue; ABGTS will be stopped.

D.✔ Gas Decay Tank release will continue; ABGTS will continue to run.

The correct answer is D.

a. Incorrect - examinee may believe that high radiation sensed in the Aux Bldg will terminate gas release and stop ABGTS. Gas release would be terminated only by Rad Monitor in release discharge piping to the Shield Bldg.
b. Incorrect - examinee may believe that high radiation sensed in the Aux Bldg will terminate gas release. Gas release would be terminated only by Rad Monitor in release discharge piping to the Shield Bldg. May think ABGTS will continue to run due to ABI, however Aux Bldg Isolation signal from high radiation in Aux Bldg vent has been removed.
c. Incorrect - examinee may believe the waste gas release will continue since it discharges to the Shield Bldg. May think that ABGTS will be stopped due to the ABI to prevent release from the Aux Bldg.
d. *Correct* - Waste gas release continues since it would be terminated only by Rad Monitor in release discharge piping to the Shield Bldg. ABGTS will continue to run. Aux Bldg Isolation signal from high radiation in Aux Bldg vent has been removed.

REFERENCES: 3-OT-SYS077B; 3-OT-SYS030A
Bank - SYS077B.002
K/A 071 K3.04
CFR 55.43.5/45.13
SRO # 60

61. 001K1.02 002/AOI-3/001 K1.02/3.6/3.7//2/NEW/2.1/
Given the following plant conditions:

- Unit is steady state at 75% power with the control rods in Automatic.
- The Auxiliary Building NAUO has placed an unborated CVCS Mixed bed in service.
- The Reactor Operator notices a change in Tavg

Which ONE of the the following lists the reason for the change and the direction of rod motion?

A. Positive reactivity is added to the RCS Rods will move out

B. Positive reactivity is added to the RCS Rods will move in

C. Negative reactivity is added to the RCS Rods will move out

D. Negative reactivity is added to the RCS Rods will move in

The correct answer is B.

a, c, d. - Incorrect - The examinee has to determine that positive reactivity will be added due to boron being removed from letdown and that Tavg will rise causing rods to move in
b. Correct - This lists correctly that positive reactivity will be added and that the rods will move in.
Reference: 3-OT-SYS062B
CFR - 41.2 to 41.9 / 45.7 to 45.8
K/A 001 K1.02
SRO # 61

62. 072K1.01 001/SOI-90.1/072K1.01/3.4/3.6//1/INPO EXAM BANK/2/1/
Radiation Monitor 1-RM-90-1, Spent Fuel Pit Area, is in HIGH alarm.

Which ONE of the following describes the effect on plant ventilation?

A. No effect.

B. Only the Auxiliary Building Supply Fans stop.

C. Only the Auxiliary Building Exhaust Fans stop.

D. Both Auxiliary Building Supply and Exhaust Fans stop.

The correct answer is A.

A. Correct - This area radiation monitor alarms only.
B. Incorrect - The examinee may confuse with RM-90-102.
C. Incorrect - The examinee may confuse with RM-90-102.
D. Incorrect - The examinee may confuse with RM-90-102.

Reference: SOI-90.1
K/A 072K1.01
CFR - 41.5/45.5
SRO # 62

63. 002A4.04 001/AOI-14/002A4.04/2.8/2.6//2/BANK/2/2/
WBN Unit 1 is in a refueling outage. The crew filled and vented the 1A RHR pump after picking up a clearance. The crew then restarted the pump per SOI 74.01.

Which ONE of the following sets of conditions would indicate that the 1A RHR pump is AIR BOUND?

A. Pump Current - HIGH
Pump Flow - LOW

B. Pump Current - LOW
Pump Flow - HIGH

C. Pump Current - LOW
Pump Flow - LOW

D. Pump Current - FLUCTUATING
Pump Flow - HIGH

The correct answer is C

A. Incorrect: The examinee may confuse pump high current due to pump cavitation because the MCR gauges oscillate rapidly at the beginning of this situation.
B. Incorrect: The examinee may confuse pump high flow due to pump cavitation because the MCR gauges oscillate rapidly at the beginning of this situation.
C. Correct: Per AOI-14 amps and flow drop on loss of suction.
D. Incorrect: The examinee may confuse pump oscillating current and flow high due to pump cavitation because the MCR gauges oscillate rapidly at the beginning of this situation.

Reference: AOI-14
Bank - AOI1400.002
CFR: 41.7/45.5 to 45.8
K/A 002A4.04
SRO # 63

64. 011K4.07 001/ACAD CHAP 4/011 K4.07/2.9/3.2//2/NEW/2/2/
In accordance with GO-10, Reactor Coolant System Drain and Fill Operations, an elevated temperature will cause Cold Cal Pressurizer level, 1-LT-68-321 to read _____(1)_____ as compared to actual Pressurizer level, due to the density of the water in the variable leg being _____(2)_____.

A. (1) Lower, (2) Lower

B. (1) Lower, (2) Higher

C. (1) Higher, (2) Higher

D. (1) Higher, (2) Lower

The correct answer is A.

A. Correct - "an elevated temperature will cause Cold Cal Pressurizer level (1-LT-68-321) to read significantly lower...." due to lower density water in the prz.
B. Incorrect - Level will be lower but not due to high density
C. Incorrect - Level will not be higher for elevated temperature, but would be for higher density.
D. Incorrect - Level will not be higher for elevated temperature, and not higher for lower density.

Reference: GO-10 App. E, Note, ACAD Chapter 4, Level Sensors and Detectors
CFR: 41.7
K/A 011 K4.07
SRO # 64

65. 012K4.05 001/3-OT-SYS0090B/012 K4.05/2.7/2.9//2/BANK/2/2/
As a part of the Trip Reduction Program, Westinghouse has incorporated Median Signal Select circuitry into the Eagle 21 protection system. Which ONE of the following correctly describes the operation of the Median Signal Select (MSS) circuitry?

A. The (MSS) averages three channels from each S/G and assigns all control and protection functions to the average values.

B. The (MSS) looks at all three channels of each S/G, selects the median channel and assigns the protection and control functions to that channel.

C. The (MSS) looks at the Median value of all S/Gs, averages this and modifies the S/G level program to the mean valve.

D. The (MSS) looks at all three channels of each S/G and selects the median channel for control. All channels retain their separation as protection channels.

The correct answer is D

a. Incorrect - Examinee may think that MSS would average the signals.
b. Incorrect - Examinee may think that MSS will select the median channel but does not assign it the protection functions.
c. Incorrect - Examinee may think that MSS will average the signals and modifies the level program.
d. Correct - This is how MSS operates.

Reference:3-OT-SYS0090B, objective 9
Bank: SYS099A.17.001
CFR: 41.2 to 41.9/45.7 to 45.8
K/A 012 K4.05
SRO # 65

66. 016K5.01 001/3-OT-SYS068C/016 K5.01/2.7/2.8//2/BANK/2/2/
Given the following conditions:

- Unit at 7% power.
- Startup in progress all bistables are in normal configuration.
- A failure of Pressurizer pressure transmitter 1-PT-68-340 resulted in the actual pressurizer pressure dropping to 1945 psig before the operating crew manually stabilized the plant with Pressurizer Master Controller in MANUAL.
- Pressurizer pressure is currently 1960 psig and rising.
- The following alarms are currently LIT due to the transient:
  - 90A - PZR Press Hi (1-M-5)
  - 124C - PZR Press Lo (1-M-6)
- The following status lights are LIT due to the transient:
  - PZR Press Hi Rx trip PS-68-340A
  - PZR Press Lo Rx trip PS-68-334E
  - PZR Press Lo Rx trip PS-68-323E
  - PZR Press Lo Rx trip PS-68-322E

Which ONE of the following is required for the above conditions in accordance with AOI-18, "Malfunction of Pressurizer Pressure Control System?"

A. Trip the reactor and Initiate Safety Injection.

B. Trip the reactor but a Safety Injection is not required.

C. Restore pressure to normal using MANUAL control of the Master Controller and transfer auto control of pressure to 1-PT-68-323 (Channel III).

D. Restore pressure to normal using MANUAL control of the Master Controller and leave in manual until 1-PT-68-340 is repaired.

The correct answer is C.

a. Incorrect - A trip is not required because the plant is below P-7 (10% power) and the pressure is above the SI setpoint. There is no First Out annunicator lit even though the status lights are lit because reactor less than P-7
b. Incorrect - A trip is not required because the plant is below P-7 (10% power) (same as above) however the not initiating of SI is correct.
c. Correct - Automatic pressure control is available and directed via the AOI to swap control to channel III
d. Incorrect - Automatic control is available - AOI will direct swapover.

Reference: AOI1800.07, 3-OT-SYS068C
CFR 41.5/45.7
K/A 016 K5.01
SRO # 66

67. 028K2.01 001/SOI-83.01/028 K2.01/2.5/2.8//1/NEW/2/2/
Which ONE of the following supplies power to the 1A-A Elec H2 Recombiner Heater?

A. 480v Aux Bldg Common Board Bus A

B. 480v Shutdown Board 1A1-A

C. 480v C&A Vent Board 1A1-A

D. 480v Reactor Vent Board 1A-A

The correct answer is D.

A. Incorrect - Examinee may think power is from common power.
B. Incorrect - Examinee may think power is from Shutdown board.
C. Incorrect - Examinee may think power is from C&A Vent board.
D. Correct - Power is from 480v Rx Vent board.

Reference: SOI-83.01 power checklist
CFR 41.2 to 41.9/45.7 to 45.8
K/A 028 K2.01
SRO # 67

68. 029A3.01 002//029A3.01/3.8 / 4.0//1/BANK/2/2/
Which ONE of the following correctly identifies the stop signal for the Containment purge supply and exhaust fans during an accident condition?

A. Containment Phase A Isolation.

B. Containment Phase B Isolation.

C✓ Containment Vent Isolation.

D. Safety Injection Signal.

The correct answer is C

a, b, d Incorrect - The examinee may confuse which isolation signal inputs to the purge fans and any of the signals listed are potential trip signals to the fans.
c. Correct

Reference:
3-OT-SYS030C
Bank SYS030C.09.001
CFR 41.7 / 45.5
SRO 68

69. 034G2.2.6 001/SPP-2.2/034G2.2.6/2.3/3.3//1/BANK/2/2/YES
Two managers, one of which must be an SRO, may perform an urgent procedure change to a Fuel Handling Instruction. Which ONE of the following statements is correct regarding temporary approval of changes to plant procedures?

A. The change may be approved only if it does not impact critical plant schedules.

B. The change may be approved only if it is an intent change required to maintain plant safety.

C. The change may be approved only if it has no impact on plant safety or reliability.

D. The change may be approved only if it is a non-intent change needed to maintain plant safety, operability, or critical plant schedules.

The correct answer is D

a. Incorrect - One reason for an urgent change is in cases where critical schedules may be impacted.
b. Incorrect - The procedure does not have to be an intent change, it can be a non-intent change, it also requires cross discipline reviews , IQR review and 10 CFR50.59 review.
c. Incorrect - SPP-2.2 states that the urgent changes are revisions which are necessary to maintain plant safety, operability or critical schedules.
d. Correct - Refer to SPP2.2

Reference: SPP-2.2
Bank: SPP0202.06.001
CFR - 43.3/45.13
K/A 034G2.2.6
SRO # 69

70. 035G2.4.22 001/FR-0/035G2.4.22/3.0/4.0//2/NEW/2/2/YES
According to FR-0 "Status Trees", which ONE of the following conditions has the highest priority?

A. ECCS is not in service, NO RCP's are running, and RVLIS is 96%.

B. RCS subcooling is 35°F, Core Exit Thermocouples's are at 650°F, one RCP is running, and RVLIS is 40%.

C✓ All S/G NR levels are between 5% and 8% and total feed flow to the S/Gs is 400 gpm.

D. Containment pressure is 15 psig.

The correct answer is C.

a. Incorrect - This is a yellow path condition fo FRI
b. Incorret - This is an orange path for FR-C
c. Correct - This is a red path for FR-H
d. Incorrect - This is a red path for FR-Z
The examinee must know the entry conditions for the FR's and know the heirarchy of prioritizing the conditions.

Reference: FR-0, 3-OT-PAI1204 Obj. #23
CFR 43/45.12
KA 35 G2.4.22
SRO # 70

71. 039A2.02 001/3-OT-AOI-3800/039A2.02/2.4/2.7//2/NEW/2/2/YES
Given the following:

- Unit in service at 100% RTP
- A S/G #1 safety valve fails OPEN.

Which ONE of the following lists the effect on the turbine load and the correct crew response per AOI-38?

A.	Turbine load drops, megawatts drop	Reduce turbine load to 90% using the VPL
B.	Turbine load rises, megawatts rise	Reduce reactor power to 90% using the VPL
C.	Turbine load drops, megawatts drop	Reduce reactor power to 90% using the VPL
D.	Turbine load rises, megawatts rise	Reduce turbine load to 90% using the VPL

The correct answer is A

a. Correct - Refer to AOI-38 step 4.
b, c, d Incorrect - The examinee must be able to determine that the safety valve lifting will cause the turbine load to decrease and know that AOI-38 directs the turbine load to be dropped to 90%.

Reference:AOI-38, 3-OT-AOI-3800
CFR 41.5 / 43.5 / 45.3 / 45.13
SRO 71

72. 055K1.06 001/AOI-33/055 K1.06/2.6/2.6//2/NEW/2/2/
If SG #1 had a tube leak of 5 gallons per day, what would be the most probable first indication that the MCR would have of the problem, disregard the possibility of a sample by Chemistry.

A. The steam generator blowdown radiation monitor, 1-RM-90-120 or 1-RM-90-121 reading rising.

B. ✓ The Vacuum Exhaust Monitor RM-90-119 reading rising.

C. A mismatch in steam generator steam flow verses feed flow for #1 SG

D. The Main Steam LIne Radiation Monitors, 1-RM-90-421 reading rising.

The correct answer is B.

A. Incorrect - Examinee may think the blowdown RM would indicate the leak prior to the vacuum exhaust RM.
B. Correct - This would be the first indication of the tube leak.
C. Incorrect - This is where a SGTR would be noticed, the leak is not large enough for this to be true.
D. Incorrect - The leak is not large enough to be indicated by this RM.

Reference:3-OT-SYS090A, 3-OT-AOI3300, AOI-33
CFR 41.5 / 45.5
SRO 72

73. 062A2.07 001/ARI-501-508/062 A2.07/3.0 / 3.4//2/NEW/2/2/
Given the following plant conditions:

- The Unit is in Mode 1, at 100% load.
- The MOD at Watts Bar Hydro that feeds the "C" CSST is accidentally opened.

Which ONE of the following identifies the status of the 6.9 kV Shutdown Boards, the correct procedure for the crew to use and the consequences of opening the MOD under load?

A. Both Shutdown Boards fed from "D" CSST.
Use AOI-40, Station Blackout.
The MOD will be damaged.

B. Both Shutdown Boards fed from "C" CSST.
Use AOI-40, Station Blackout.
The MOD will be undamaged.

C✓ Shutdown Board 1A-A fed from D/G and Shutdown Board 1B-B from "D" CSST.
Use AOI-43.01, Loss of Unit 1 Train A Shutdown Boards.
The MOD will be damaged.

D. Shutdown Board 1B-B fed from D/G and Shutdown Board 1A-A from "C" CSST.
Use AOI-43.02, Loss of Unit 1 Train B Shutdown Boards.
The MOD will be undamaged.

The correct answer is C.

a. Incorrect - The examinee may think that due to the loss of a CSST that the 1A board will tranfer to the other CSST and that the Station Blackout procedure is needed.
b. Incorrect - The examinee may think that the "C" CSST line at WB hydro may tranfer to an alternate source and that the Station Blackout procedure is needed.
c. Correct - The board will load shed and the diesel will start and tie on to the shutdown board, the AOI-43.01 is the proper procedure and the MOD will be damaged.
d. Incorrect - The examinee may mix up which tranformer feeds which board.

Ref:1-45W760-211-1, ARI-501-508, 3-OT-SYS201A, AOI-43.01.
CFR 41.5 / 43.5 / 45.3 / 45.13
SRO 73

74. 064K2.03 002/3-OT-SYS082A/064 K2.03/3.2 / 3.6//1/NEW/2/2/
An Operator at the 1A-A DG local panel has verified that the DG has lost it's control power.

Which ONE of the following would be the correct panel to verify control power for 1A-A DG?

A. 125V DC Vital Battery Board I.

B. DG 1A-A 125V DC Distribution Panel.

C. 120V AC Vital Instrument Power Board 1-I.

D. 120V AC Preferred Power Board 1.

The correct answer is B

A. Incorrect - The examinee may think that the DG uses vital DC power since it's a protected power supply.
B. Correct - The correct power supply is from the DG 125v DC Distribution board.
C. Incorrect - The examinee may think that the DG uses vital AC power since it's a protected power supply.
D. Incorrect - The examinee may think that power comes from the Perferred distribution.

Reference 3-OT-SYS082A, SOI-82.01
CFR 41.7
SRO 74

75. 073A1.01 001/SOI-77.02/073 A1.01/3.2/3.5//1/NEW/2/2/
The following plant conditions exist:

- A waste gas decay tank release is in progress.
- 0-RM-90-118, Waste Gas Effuent Monitor, is in service.
- 184-A "WGDT Rel Line 0-RM-118 Rad Hi" annunciator received.

What will happen as a result of the high radiation?

A. Auxiliary Building Isolation.

B. 0-FCV-77-119, Plant Vent Flow Control will trip closed.

C. 0-RM-90-118, Waste Gas Effuent Monitor is alarm only.

D. Containment Vent Isolation.

The correct answer is B.

A. Incorrect - Examinee may not know that high radiation will cause 0-FCV-77-119 to close.
B. Correct - 0-FCV-77-119 will close on high radiation from 0-RM-90-118, Waste Gas Effuent Monitor.
C. Incorrect - The examinee may confuse the functions of 0-RM-90-118, Waste Gas Effuent Monitor, due to the program at WBNP to reduce nuisance actuations.
D. Incorrect - Examinee may feel that since the exhaust is via the shield building stack that a CVI is needed.

Reference: SOI-77.02, ARI 184A
CFR 41.5 / 45.7
SRO 75

76. 075K3.07 001/AOI-11/075 K3.07/3.4/3.5//2/BANK/2/2/
Given the following conditions:

- Unit 1 is at 60% power.
- 3 CCW pumps are running.
- East Waterbox is isolated to plug a leaking tube.
- West Waterbox inlet isolation valve fails CLOSED.

Which ONE of the following describes the plant response? (Assume NO operator actions)

A. The CCW inlet conduit ruptures due to overpressure.

B. CCW pumps trip resulting in rising condenser pressure which remains below the trip setpoint.

C. CCW flow to the condenser drops by ~50% resulting in rising water box discharge temperatures.

D. Condenser pressure will rapidly rise resulting in a turbine and reactor trip.

The correct answer is D

a. Incorrect - The discharge pressure of the CCW pumps would not get high enough to cause this.
b. Incorrect - The condenser pressure will rise until a trip is received.
c. Incorrect - The flow will drop by 100%
d. Correct - With a loss of CCW flow the pressure will rise until a turbine trip is received which will cause a reactor trip as this power level.

Reference: 3-OT-AOI1200, AOI-11
Bank SYS027A.07.005
CFR 41.7 / 45.6
SRO 76

77. 079A4.01 001/SOI-33.01/079 A4.01/2.7/2.7//2/BANK/2/2/
Given the following plant conditions:

- A service air isolation has occurred.
- Control air has been restored to normal.

Which ONE of the following must be done FIRST in order to reopen service air isolation valve, 0-PCV-33-4?

A. Stop any additional C&SS compressors not needed.

B. Reset 0-PS-33-4 Service Air Supply Isolation Pressure.

C. Throttle open 0-ISV-33-502, Service Air 0-PCV-33-4 Bypass.

D. Place 0-HS-33-4 Service Air Supply Isolation to the AUTO position.

The answer is C.

A. Incorrect - Examinee may think the upstream pressure must be reduced to open the valve.
B. Incorrect - Examinee may think the delta pressure on the valve and the extra load on the system would have no effect.
C. Correct - Per SOI 33.01 section 8.1
D. Incorrect - Examinee may not understand the controls for 0-PCV-33-4.
Reference: SOI-33.01, section 8.1
3-OT-SYS033A
Bank SYS033A.05
CFR 41.7 / 45.5 to 45.8
SRO 77

78. 086.K6.04 002/1-45W600-26-15/086.K6.04/2.6/2.9//1/NEW/2/2/
The smoke detector is knocked from its socket by a worker while patching the ceiling in the operations kitchen. The thermal detector is still functioning.

What will be the effect on the fire protection system from the loss of the detector?

A. The detector is redundant and will have no effect on the fire protection system.

B. The detector is needed for a cross zone and its loss will make the fire protection system inoperable in the kitchen area.

C. The detector will not effect the fire protection system since it is alarm only.

D. The loss of detector will cause a start of the HPFP pumps and open the kitchens deluge valve.

The correct answer is B.

A. Incorrect - The examinee may think that both detectors are independent.
B. Correct - The kitchen area has 2 detectors and requires both to actuate the fire protection system.
C. Incorrect - The examinee may think that the detector is used for alarm only.
D. Incorrect - The examinee may think that the detector will cause a contact closure in the fire protection system, however the contacts are located in the detector.

Reference: 1-45W600-26-15, 47W600-248, 3-OT-SYS-026A, SOI-13.01
CFR: 41.2 to 41.9 / 45.7 / 45.8
SRO 78

79. 103K3.03 002/TS 3.9.4/103 K3.0.3/3.7/41//2/NEW/2/2/YES
Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- The Containment Purge is being placed in service to upper containment.
- A malfuction causes the Containment Purge Air exhaust fan to trip.
- As containment pressure rises a loud hissing sound is heard at the seal in the equipment hatch to containment .

Which ONE of the following describes the action to be taken?

A. Suspend movement of irradiated fuel within containment immediately.

B. Restore containment to OPERABLE status within 1 hour.

C. Suspend movement of irradiated fuel within containment within 1 hour.

D. Restore containment to OPERABLE status immediately.

The correct answer is A

A. Correct - Per TS 3.9.4, in mode 6 containment penetrations must be able to mitigate a fuel handling accident.
B. Incorrect - The examinee may confuse mode 1-4 containment integrity TS with mode 6.
C. Incorrect - The examinee may confuse the completion time of mode 1-4 with mode 6.
D. Incorrect - The examinee may confuse the required action of mode 1-4 with mode 6.

Reference: TS 3.9.4, 3-OT-T/S0309
K/A 103 K3.03
CFR 41.7 / 45.6
SRO 79

80. 008.2.1.12 001/T/S3.7.7/008.2.1.12/2.9 /24.0//2/MOD/2/3/YES
Given the following conditions:

- Plant operating at 100% RTP
- All systems in a normal alignment.
- C-S CCS pump trips due to a problem with it's supply breaker.

Which ONE of the following will meet the Tech Spec LCO requirements due to the CCS pump trip?

A. Restore the C-S CCS pump to OPERABLE status within 7 days.

B. Aligning the 1B-B CCS pump to supply Unit 1 Train B CCS within 72 hours.

C. Place the 2B-B CCS pump in service to restore flows and pressure to normal within 7 days.

D. Align C-S pump to its alternate power supply through the manual transfer switch within 72 hours.

The correct answer is B.

a. Incorrect - Must be restored within 72 hours, the 7 day requirement is a SR for the alternate breaker for C-S pump.
b. Correct - if the 1B-B pump is aligned within 72 hours.
c. Incorrect - 2B-B pump is available for B train but does not meet the requirement to ensure an independent train.
d. Incorrect - C-S could be aligned to its alternate power supply, however it is an "A" train power supply and would not meet requirements for independent train.

Reference:
3-OT-SYS070A
LCO 3.7.7
Bank SYS070A.16 001
CFR 43.2 / 43.5 / 45.3
SRO 80

81. 041K6.03 001/3-OT-SYS001B/041 K6.03/2.7/2.9//2/BANK/2/3/
Given the following plant conditions:

- Unit is in HOT STANDBY at 557°F.
- Steam Dump is in Steam Pressure Mode.
- Impulse pressure transmitter, PT-1-73 fails HIGH.

Which ONE of the following describes the Steam Dump System response?

A. "D" Solenoid will be energized but no valves will open.

B. "D" Solenoid will be energized and 12 valves will open.

C. "D" Solenoid will NOT be energized and no valves will open.

D. "D" Solenoid will NOT be energized but 12 valves will open.

The correct answer is C

a. Incorrect - The D solenoid will not be energized
b. Incorrect - The D solenoid will not be energized and no valves will open
c. Correct - The D solenoid will not be energized due to the 1-73 failing high and the valves are controlled in the steam pressure mode, 1-73 has no impact on the valve position
d. Incorrect - No valves will open.
The examinee will have to determine the effect on the 1-73 failure on the D solenoid and also determine that the dumps are armed by steam pressure mode. The distractors are valid due to these are the possible combinations of valve positions and D solenoids.

Reference:3-OT-SYS001B
CFR 41.7 / 45.7
Bank SYS001B.06.003
SRO 81

82. 076K2.04 002/SYSO70A/076K2.04/2.5/2.6//2/BANK/2/3/
Given the following:

- Unit is at 100% power.
- All systems are normal.
- 1A-A, C-S, & 2 A-A CCS pumps are in service.
- Black-Out occurred on 1A-A 6.9Kv shutdown board due to the normal feeder breaker opening.

Which ONE of the following identify the status of the CCS pumps two minutes after power restored to the board by 1A-A DG?

A. All 5 CCS pumps running

B. All CCS pumps running except 2B-B

C. All CCS pumps running except 1B-B

D. Only 1A-A, CS, and 2A-A CCS pumps are running

The correct answer is B.

Incorrect - The examinee may choose this since the oringnal design was for all pumps to run.
Correct - By design all but 2B-B pump will be running.
Incorrect - The examinee may confuse 2B-B with 1B-B pump.
Incorrect - The examinee may confuse the normal alignment with blackout alignment.

Reference: 3-OT-SYS070A
Bank: SYS070A.19.011
CFR 41.7
SRO 82

83. 078A3.01 001/3-OT-SYS032A/078A3.01/3.1 / 3.2//1/BANK/2/3/
Given the following plant conditions:

- The plant is at 100% power.
- The control air header has been breached such that all header pressures are dropping at a steady rate.
- C and SS Air Compressors A & B have started automatically.

Which ONE of the following describes the impact of the steady loss of air pressure on the compressed air systems?

A. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig
Aux Air Compressors START at 80 psig,
Aux Air is ISOLATED from Control Air at 79.5 psig.

B. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig
Aux Air Compressors START at 78 psig
Aux Air is ISOLATED from Control Air at 79.5 psig.

C. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig
Aux Air Compressors START at 78 psig
Aux Air is ISOLATED from Control Air at 77.5 psig.

D. Service Air Supply Valve 0-PCV-33-4 will CLOSE at 80 psig
Aux Air Compressors START at 80 psig
Aux Air is ISOLATED from Control Air at 77.5 psig.

The correct answer is A.

a. *Correct*
b, c, & d. Incorrect - The examinee may not know the setpoints and all of these have at least one which is incorrect.

Reference:
3-OT-SYS032A
Bank SYS032A.16.09
CFR 41.7 / 45.5
SRO 83

84. 002.1.3 001/OPDP-1/2.1.3/3.0 / 3.4//1/BANK/3/
You are assuming the US duties after a one week absence.
Which ONE of the following is required?

A. Review the narrative log and checklists for all stations.

B. Immediately after shift relief is completed individual position checklists are forwarded to Document Control through the Unit Supervisor.

C. Review the narrative log. The review shall include all narrative logs since the last shift worked.

D. Review the narrative log. The review shall include all narrative logs for the previous three days.

The correct answer is D.

a. Incorrect - The examinee may think that this is appropriate, the checklists contain pertinent information for each watchstation which the examinee may decide is nessary to review.
b. Incorrect - The completed checklists could be forwarded to Document Control for record retention.
c. Incorrect - The log needs to be reviewed but only for the previous 3 days.
d. Correct

References: 3-OT-SPP1000; OPDP-1
Bank PAI0211.03
CFR 41.10 / 45.13
SRO 84

85. 002.1.7 001/ECA-0.0/2.1.7/3.7 / 4.4//2/NEW/3/YES
The unit had been operating at 100% power when the following occurred:

- A loss of both 161KV lines due to a fire at the hydro plant.
- The 1A-A and 1B-B D/Gs did not start.
- The reactor was tripped due to a loss of the shutdown boards.
- RCS depressurization has been initiated per the appropriate procedure.
- The STA reports that the IR SUR is +.30 dpm.

Which ONE of the following should be performed?

A. Reduce RCS pressure with pressurizer PORVs to ensure CLA injection of borated water.

B. Control S/G PORV's to stop RCS depressurization and allow the RCS to heat up.

C. Continue cooldown to allow CLA injection of borated water at 600 psig RCS pressure.

D. Stop PORV flow and transition to FR-S.1, Response to Nuclear Power Generation / ATWS.

The correct answer is B

a. Incorrect - The CLA would add boron at a lower pressure, but this is not correct.
b. *Correct* - Refer to ECA-000
c. Incorrect - The cooldown would allow the RCS to depressurize and the CLA to inject.
d. Transitioning to FR-S.1 would be the correct response if not in ECA-0.0.

Reference: ECA-0.0; 3-OT-ECA0000
CFR 43.5 / 45.12 / 45.13
SRO 85

86. 002.1.25 001//2.1.25/2.8 / 3.1//2/MOD/3/
Given the following plant conditions:

- The Unit is in Mode 5, following a Refueling outage.
- The RCS is in Mid Loop operation at 105° F.
- 1A RHR pump is in service at 2300 gpm.
- Preparations are in progress to begin RCS Vacuum Refill.

Using Appendices AD and AE of GO-10 (provided), "Reactor Coolant System Drain and Fill Operations", which ONE of the following describes the expected time to raise RCS vacuum from 5 in Hg. to the maximum allowable value ?

A. 35 minutes.

B. 60 minutes.

C. 100 minutes.

D. 145 minutes.

The correct answer is C

a, b, & d. Incorrect - The examinee must read the correct RHR flow, RCS temperature and initial vacuum to arrive at the correct answer, these are all possible answers if he starts with the incorrect initial values or reads the graph wrong.
c. *Correct* - Refer to attached graphs.

Reference: GO-10; 3-OT-GO1000
Bank GO1000.01.016
CFR 41.10 / 43.5 / 45.12
SRO 86

87. 002.1.34 001/3-OT-SYS002A/2.1.34/2.3 / 2.9//1/BANK/3/
Which ONE of the following identifies chemicals injected into the condensate cycle and the purpose of each?

A. Ethanolamine (ETA) for pH control
Hydrazine for oxygen scavenging

B. Ethanolamine (ETA) for oxygen scavenging
Hydrazine for pH control

C. Sodium for pH control
Hydrazine for oxygen scavenging

D. Sodium for oxygen scavenging
Hydrazine for pH control

The correct answer is A.

a. *Correct* - Refer to 3-OT-SYS002A
b. Incorrect - The purposes for the chemicals are reversed.
c, & d. Incorrect - Sodium could be used as a chemical to inject into condensate for chemical control, the examinee could pick this if he did not know that ETA was used for pH control.

Reference: 3-OT-SYS002A
Bank SYS002A.10
CFR 41.10 / 43.5 / 45.12
SRO 87

88. 002.2.20 001/SPP-6.1/G2.2.20/2.2/3.3/NRC 1-26-02/2/BANK/3/YES
Given the following plant conditions:

- Plant is in Mode 3 with startup in progress.
- The breaker for "C" hotwell pump will not close.
- The Shift Manager and Work Week Manager determined that trouble shooting could be conducted as "minor work" if the pump is tagged out.

Which ONE of the following describes how this trouble shooting activity should be documented?

A. WO is NOT required since only trouble shooting is planned and will have no operational impact, no detailed planning or documentation is required.

B. WO is NOT required since a PER will be written to address the condition adverse to quality and trouble shooting may be documented in the PER.

C.✔ WO is required, the WO may be sent directly to the craft after OPS approval and the work may be documented on the WO form.

D. WO is required, the WO must be routed to planning after OPS approval and the work will be conducted and documented in the work package developed by the planner.

The correct answer is C.

a. Incorrect - examinee may confuse "minor work" with "tool pouch maintenance". No WO is required for "tool pouch maintenance".
b. Incorrect - examinee may believe that trouble shooting may be documented on a PER, such as for immediate corrective actions taken, and that a WO is not required.
c. *Correct* - this trouble shooting activity was determined to be "minor work" which requires a WO however detailed planning is not required and work may be documented on the WO form.
d. Incorrect - "minor work" does not require planning or detailed documentation in a work package. Examinee may believe that "minor work" WO must be planned through normal WO process.

REFERENCES: SPP-6.1; 3-OT-SPP0601
Bank SPP0601.06.002
CFR 43.5/45.13
SRO-88

89. 002.2.28 001/AOI-29/2.2.28/2.6 / 3.5//1/BANK/3/YES
You are the Refueling SRO. During fuel off-load you notice refueling cavity level dropping.

- A fuel assembly is being moved by the refueling machine.
- The Rx Bldg Upender is in the UP position.
- The fuel transfer cart is in the Rx Bldg.

In accordance with AOI-29, Dropped or Damaged Fuel or Refueling Cavity Seal Failure, where are you directed to store the fuel assembly?

A. In the Rx Bldg. Upender

B. In the RCCA Change Fixture.

C✓ In the Reactor Vessel Core.

D. In the Spent Fuel Pit.

The correct answer is C.

a, b, d. Incorrect - These are possible places to store the fuel assembly which the examinee could pick if he did not know the appropriate location.
c. Correct - Refer to AOI-29

Reference: AOI-29; 3-OT-AOI2900
CFR 43.7 / 45.13
SRO 89

90. 002.2.31 001//2.2.31/3.5 / 2.9//2/BANK/3/YES
Refueling is in progress and the refueling machine operator is inserting a fuel assembly into the core.

Which ONE of the following cautions should be observed while lowering the fuel assembly into the core region?

A. Monitor the weight indicator continuously for an unexpected drop of 50 pounds which would require operators to stop lowering the fuel assembly.

B. Monitor the Z-axis tape continuously to ensure the mast is not lowered below the mast disengagement position.

C. Use slow speed when inserting fuel-bottom nozzle approximately 10 inches above and 10 inches below the top of the seated fuel assemblies and within 10 inches of full down.

D. Use the gripper mast down (red) light to determine the assembly is fully lowered and can be disengaged.

The correct answer is C.

a. Incorrect - A weight change of 100 pounds would require stop of lowering fuel assemblies.
b. Incorrect - The Z-axis tape is looked at for gripper location.
c. *Correct*
d. Incorrect - The Slack Cable Message is used to determine the assembly is lowered.

Reference: FHI-7
Bank FHI0700.01 003
CFR 43.6
SRO 90

91. 002.2.33 002/3-OT-SYS-085A/2.2.33/2.5/2/9//2/BANK/3/
Given the following conditions:

- T-avg loop 1 is 572°F.
- T-avg loop 2 is 567°F.
- T-avg loop 3 is 570°F.
- T-avg loop 4 is 565°F.
- T-ref is 569°F.
- Rod Control is in automatic.

Which ONE of the following describes how the Rod Control System will respond?

A. Rods will step in at 8 steps/min due to loop 4 T-avg to Tref difference.

B. Rods will step in at 40 steps/min due to loop 3 T-avg to T-ref difference.

C. Rods will step in at 8 steps/min due to loop 1 T-avg to T-ref difference.

D. Rods will not move because the difference between auctioneered high T-avg to T-ref is insufficient to cause rod motion.

The correct answer is C.

A. Incorrect - The examinee may not know that auctioneered high loop is used.
B. Incorrect - The examinee may not recognize that loop 3 is defeated in the rod input circuit.
C. Correct - The difference of between Tref and Loop 1 tavg produces a 3°F error which is the minimum rod programming threshold.
D. Incorrect - The examinee may not recognize the rod programming threshold.
Reference: 3-OT-SYS085A
Bank SYS085A.11.003
CFR 43.6
SRO 91

92. 002.3.2 001/3-OT-RAD0003/2.3.2/2.6 / 3.0//1/BANK/3/
Which ONE of the following describes the purpose of establishing limits for radiation protection?

A. Protects plant workers and the general public from the harmful effects of radiation as well as maintaining personnel exposure ALARA.

B. Protects plant equipment and structures from damaging effects of radiation exposure during accident conditions.

C. Provides a basis on which all nuclear utilities can work together in the event of a radiological accident.

D. Prevents the the unapproved distribution of radiation dose throughout the nuclear population.

The correct answer is A.

a. *Correct*
b. Incorrect - This could be a concern for plant equipment which the examinee would pick.
c. Incorrect - This could be a concern for the nuclear industry and emergency planning.
d. Incorrect - This could be a concern for monitoring radiation exposure and HP.

Reference: 3-OT-RAD0003 objective 1
CFR 41.14 / 43.4 / 45.10
Bank RAD0003.01
SRO 92

93. 002.3.3 002//2.3.3/1.8/2.9//2/BANK/3/YES
During the performance of AOI-31, "Abnormal Release of Radioactive Material", operators have determined that the Station Sump is the source of the radioactive release and have stopped both pumps.

Which ONE of the following should the SRO direct the sump be realigned to?

A. Cooling Tower blowdown line.

B. Lined pond.

C. Unlined pond.

D. Radwaste Demin system.

The correct answer is C

a, b, d Incorrect - These are potential paths to align the sump to and the examinee has to be able to determine the correct path from those listed.
c. Correct - Refer to AOI-31

Reference:
AOI-31
3-OT-AOI3100
Bank AOI3100.04.05
CFR 43.4 / 45.10
SRO 93

94. 002.3.9 002//2.3.9/2.5 / 3.4//1/BANK/3/
Given the following:

- Unit is at 100% power.
- A containment purge is required to be performed on this shift to allow containment entry.

Which ONE of the following is applicable for placing the Containment Purge system in service at this time?

A. Lower containment radiation monitors must be in service.

B. Containment pressure must be greater than atmospheric pressure.

C. Only one set of purge supply and exhaust lines can be used for the purge.

D. An operator must be available to manually shutdown the purge in the event of an ABI.

The correct answer is C
a. Incorrect - This is not true for purge but the examinee may think it is necessary to perform the purge.
b. Incorrect - The containment pressure is greater than the annulus, not necessary to be greater than atmospheric.
c. Correct - Refer to the precautions of SOI-30.02
d. Incorrect - The examinee may think this is necessary since the purge units are in the aux building and could be affected by an ABI.

Reference:
3-OT-SYS030C
SOI-30.02
Bank SYS030C.09.007
CFR 41.7 / 45.5
SRO 94

95. 002.3.10 001/AOI-31/2.3.10/2.9/ / 3.3//2/BANK/3/YES
Given the following conditions:

- Unit 1 at 100% RTP.
- Several Auxiliary Building Area Radiation Monitors rise to the alarm setpoint.

In accordance with AOI-31, Abnormal Realease of Radioactive Material, which ONE of the following actions should be taken first?

A. Initiate an ABI.

B. Use the PA to evacuate the Auxiliary Building.

C. Activate the plant emergency alarm and initiate plant assembly.

D. Initiate a Containment Vent Isolation (CVI).

The correct answer is B

a. This may be required, but first evacuate the Aux Bldg.
b. *Correct* - Refer to AOI-31
c. Incorrect - This also may be required if levels are too high.
d. Incorrect - The examinee may confuse the ABI and the CVI being required.

Reference: AOI-31 Section 3.2 , 3-OT-AOI3100
Bank AOI3100.03.001
CFR 43.4 / 45.10
SRO 95

96. 002.4.20 001/E-3/2.4.20/2.7 / 3.6//2/INPO EXAM BANK/3/YES
E-3, "Steam Generator Tube Rupture," contains the CAUTION "If any Ruptured S/G is also faulted, feed flow should remain isolated in subsequent steps UNLESS needed for RCS cooldown."

Which ONE of the following would be the consequence of violating this caution by continuing AFW flow?

A.✔ Aggravate an uncontrolled cooldown of the RCS and increase the possibilty of SG overfill.

B. Extend the time required for a ruptured/faulted SG depressurization.

C. Cooldown the ruptured/faulted SG, thus extending the time required to refill the pressurizer.

D. Dilute the RCS and lead to a loss of shutdown margin.

The correct answer is A.

a. *Correct*
b. Incorrect - The examinee may consider this since the time required for faulted SG depressurization is an important concern for SG rupture events.
c. Incorrect - Feeding the faulted SG would cooldown the RCS but the concern is not for cooling down the SG.
d. During a SG tube rupture the RCS is usually cooled and depressurized to RHR conditions by backfill and a concern during backfill is a loss of shutdown margin from diluting the RCS.

Reference
E-3
3-OT-EOP0300
CFR 41.10 / 45.13
SRO 96

97. 002.4.21 001/FR-0/2.4.21/3.7 / 4.3//2/MOD/3/YES
Given the following plant conditions:

- E-1 is being performed
- Unit 1 was at 73% power.
- A Reactor trip and SI on low steam line pressure occurred 21 minutes ago.
- Average Core Exit T/C temperature is 400°F.
- Pressurizer pressure is 1350 psig.
- All S/G pressures are DROPPING slowly.
- S/G #2, and #3 levels are 15% NR and DROPPING slowly.
- S/G's #1, level is 16% NR, and RISING slowly.
- S/G's #4, level is STEADY at 2% NR.
- Total feedwater flow is 440 gpm.
- PZR level is 10% and RISING.
- RCS T-cold temperature is 265°F and DROPPING slowly.
- Containment pressure is 5 psig and RISING slowly.

Which ONE of the following Critical Safety Functions is the MOST degraded?

A. Heat Sink

B. Core Cooling

C. Containment

D. Pressurized Thermal Shock

The correct answer is C.

a. Incorrect - The examinee may see the SG levels being below the adverse setpoint for FR-H and pick this answer, this is yellow for this condition with the low SG levels.
b. Incorrect - Tehe examinee may think that with the low RCS pressure and low SG levels that core cooling may be degraded..
c. *Correct* - With 5 psig then the containment safety function is degraded to orange.
d. Incorrect - This would be a yellow path for the conditions given.

Reference: FR-0
Bank FRH001.01.010
CFR 43.5 / 45.12
SRO 97

98. 002.4.27 001/AOI-30/2.4.27/3.0 / 3.5//1/BANK/3/
Which ONE of the following describes the minimum information that should be obtained from a person reporting a fire to the MCR?

A. Name of person reporting, location, type and severity of fire.

B. Name of person reporting, support personnel required, type and location of fire.

C. Name of person reporting, Safety related equipment affected and location of fire.

D. Type, location and severity of the fire.

The correct answer is A.

a. *Correct*
b. Incorrect - The examinee may consider that support personnel required is necessary.
c. Incorrect - The examinee may consider that the safety related equipment affected is required to be reported.
d. Incorrect - These are all required but the name of the person is left out.

Reference: AOI-30; 3-OT-AOI3000
Bank AOI3000.02.001
CFR 41.10 / 43.5 / 45.13
SRO 98

99. 002.4.29 001/EPIP-3/2.4.29/2.6 / 4.0//1/BANK/3/YES
EPIP-1 states that the acceptable time frame for notification to the ODS following an emergency is considered to be five (5) minutes.

Which ONE of the following identifies the time period of this 5 minutes?

A. Between the declaration of the emergency and notifying the ODS.

B. Between beginning of the emergency and notifying the ODS.

C. Between the identification of the event and notifying the ODS.

D. Between the transition from E-0 and notifying the ODS.

The correct answer is A.

a. *Correct*
b. Incorrect - The examinee could think that this is valid since this time could be used for a time which the state would want to know about the event.
c. Incorrect - The identification of the event is used as the start time for having to declare the event.
d. Incorrect - WBN used to use the transition for E-0 as the starting time for when the event had to be declared, the examinee could confuse this as when the clock starts for when the ODS has to be notified.

References: EPIP-3, 3-OT-PCD -048C
Bank PCD048C.004
CFR 43.5 / 45.11
SRO 99

100. 2.4.50 001/ARI-94-A, AOI-2/2.4.50/3.3 / 3.3//1/BANK/3/
Given the following plant conditions:

- Unit 1 is at 100% power.
- Control rods are in AUTO and NOT moving.
- TAVG-TREF DEVIATION annunciator is lit.
- No rod stop annunciators are lit.
- Urgent failure annunciator is NOT lit.

Which ONE of the following actions should be taken?

A. Place rod control in MANUAL and verify control rod operability by moving rods 10 steps per 1-SI-85-2.

B. Place rod control in MANUAL and borate / dilute to match Tavg and Tref.

C. Place rod control in MANUAL and match Tavg and Tref using rods.

D. Trip the reactor and enter E-0, Reactor Trip or Safety Injection.

The correct answer is C.

a. Incorrect - The rods are verified operable per 1-SI-85-2 when the rod control problem is repaired, this would not correct the tavg / tref deviation.
b. Incorrect -This would correct the tavg / tref deviation but it would take more time and the ARI and AOI-2 direct using rods or the turbine.
c. *Correct* - Refer to AOI-2 and ARI-94-A
d. Incorrect - If the rods move after placing them in manual this would be the appropriate response.

Referecnce: ARI-94-A, AOI-2, 3-OT-AOI0200
Bank AOI0200.12.0083
K/A 2.4.50
CFR 45.3
SRO # 100