

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 1**

EOP-1, CAUTION 1, part 2 identifies RPV levels above which RPV level instruments may be used when the containment or drywell temperature near the reference legs is at the specified limits. At these elevated RUN TEMPERATURES, the instruments would:

- A. Fail offscale low.
- B. Continue to indicate level onscale when actual RPV level went below the variable leg tap.
- C. Continue to indicate level onscale when actual RPV level went offscale high (above the indicating range).
- D. Provide erratic level indication when actual RPV level went offscale low due to loss of the variable leg.

**ANSWER: B**

**IDNO: 3**

NRC KA:	RO:	SRO:
295028 EK2.03	3.6	3.8

**LP # HLO-511 OBJ # 6**

**REFERENCES EOP Caution #1**

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**QUESTION 2**

Given the following plant conditions:

Reactor power: 45%

Generator load: 480 MWe

CRD Pump "A" is tagged bearing oil replacement

Control Rods are being withdrawn for power ascension.

The Main Turbine First Stage Shell Pressure transmitter is failed upscale.

The Reactor Engineer directs the ATC operator to select and continuously withdraw control rod 28-49 from notch 12 to notch 24.

Using the attached pull sheet determine which one of the following correctly describes the response of Control Rod 28-49 and the reason for the response?

- a. Control Rod 28-49 will remain at notch position 12 due a control rod block generated from a failure of the turbine first stage pressure transmitter.
- b. Control Rod 28-49 will withdraw to notch position 20 and settle due to the withdrawal limitations between the Low Power Setpoint and the High Power Setpoint.
- c. Control Rod 28-49 will withdraw to notch position 16 and settle due to the withdrawal limitations imposed above the High Power Setpoint.
- d. Control Rod 28-49 will withdraw to notch position 14 and settle due to the single notch withdrawal constraints of the Rod Pattern Controller.

**ANSWER: C.**

**IDNO:** 665

NRC KA:	RO:	SRO:
201005 A1.01	3.2	3.3
201005 K6.01	3.2	3.2

**LP #** HLO-057 **OBJ #** 12

**REFERENCES** STP-500-0704

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**QUESTION 3**

The reactor has been operating near rated power for 100 days. Which one of the following describes the change in the indicated LPRM output signal from day 1 to day 100 and the method used to calibrate the LPRMs?

- | INDICATED LPRM POWER | METHOD OF LPRM CALIBRATION |
|----------------------|----------------------------|
| a. Decreases         | Core Heat Balance          |
| B. Increases         | Core Heat Balance          |
| C. Decreases         | TIP System Trace           |
| d. Increases         | TIP System Trace           |

**ANSWER: C.**

**IDNO:** 89

NRC KA:	RO:	SRO:
215001 K1.01	2.5	2.8
215005 K1.13	2.6	3

**LP #** STM-503      **OBJ #** 9

**REFERENCES** SOP-0074      LEVEL 2

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**QUESTION 4**

Certain Safety Relief Valves are designated as “Low-Low Set”.

Which one of the following describes the bases and operation of the “Low-Low Set SRVs”?

- A. When the first SRV opens on the relief function, two (2) SRV relief setpoints are lowered. This is done to minimize the cyclic stress on the Containment due to SRV lifting and ensures the Containment design basis is met.
- B As reactor pressure increases above the scram setpoint, the relief setpoints on five (5) SRVs are lowered to start them opening well below the design pressure of the reactor vessel to prevent exceeding reactor design pressure.
- C. When the first SRV opens on the relief function, five (5) SRVs are opened automatically and their reset pressures are lowered. This minimizes the number of SRV lifts by extending the length of time they are open.
- D. As reactor pressure increases above the scram setpoint, the reset setpoints for five (5) SRVs are lowered. This minimizes the number of SRV lifts by extending the length of time they are open.

**ANSWER: A**

**IDNO: 551**

NRC KA:	RO:	SRO:
295025 EK3.09	3.7	3.7
295025 EA2.01	4.3	4.3

**LP #**

**OBJ #**

**REFERENCES** TS 3.3.6.4 CFR 41.3  
TS Bases 3.6.1.6 CFR 41.5  
CFR 41.7  
CFR 43.2

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**QUESTION 5**

The unit is operating at power when a COMPLETE loss of Turbine Plant Component Cooling Water (CCS) occurs. Which one of the following lists the critical equipment which has lost cooling that requires the operator to scram the reactor per AOP-0012, Loss of Turbine Plant Component Cooling?

- a. Auxiliary boiler recirc pumps and offgas refrigeration units.
- b. Condenser air removal and generator stator cooling pumps.
- c. Heater drain and condenser air removal pumps.
- d. Reactor feedwater and condensate pumps.

**ANSWER: D.**

**IDNO:** 104

NRC KA:	RO:	SRO:
295018 AK1.01	3.5	3.8
295018 AA2.01	3.3	3.4

**LP #**

**OBJ #**

**REFERENCES** AOP-0012

NRC KA:	RO:	SRO:
295003 AK1.02	3.1	3.4
226001 A2.02	3.6	3.9
226001 A2.03	3.9	4.3
295003 AK3.03	3.5	3.6

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**QUESTION     7**

Following a small break LOCA, indicated wide range reactor level is 20" and slowly increasing due to RCIC injection from the CST. Other plant parameters are as follows:

- RPV pressure                      550 psig
- Suppression pool temp        140 deg. F
- Containment pressure        4.0 psig

The MINIMUM suppression pool level which will assure adequate heat capacity is:

- a. 15.4 ft
- b. 19.6 ft
- c. 17 ft
- d. 21.25 ft

**ANSWER:    A.**

**IDNO:**            136

NRC KA:	RO:	SRO:
295026 EK2.06	3.5	3.7
295026 EK3.01	3.8	4.1

**LP #     HLO-514                      OBJ #     8**

**REFERENCES**    EOP-0002                      LEVEL 3  
                         HCTL Curve

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**QUESTION 8**

With irradiated fuel stored in the spent fuel pool (SFP), mechanical maintenance is preparing to move a 1400 lb. motor across the pool using the fuel building overhead crane:

Why will this move not be permitted?

- a. No load in excess of 1200 lb. is permitted to travel over the fuel storage racks by procedure.
- b. Mechanical maintenance is NOT authorized to use the fuel building overhead crane with fuel in the SFP.
- c. A 1400 lb. weight exceeds the load limit of the fuel building overhead crane.
- d. Reactor engineering support is required for any evolution involving irradiated fuel.

**ANSWER: a**

**IDNO:** 180

NRC KA:	RO:	SRO:
G 2.2.26	2.5	3.7

**LP #** **OBJ #**

**REFERENCES** FHP-0001



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**QUESTION 9**

Unless the backup charger is connected to the HPCS bus, the Backup charger Supply Breaker (IE22-CB10) from IE22-PNLSOO1 should be locked in the open position.

This ensures that:

- a. the backup battery charger is not overloaded.
- b. the backup charger continuously meets Technical Specification operability requirements.
- c. separation between redundant Safety Related systems is maintained.
- d. damage to the rectifier stack does not occur.

**ANSWER: C.**

**IDNO:** 194

NRC KA:	RO:	SRO:
263000 K1.02	3.2	3.2
263000 A1.01	2.5	2.8

**LP #** **OBJ #**

**REFERENCES** SOP-0049

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**QUESTION 10**

For which of the following sets of plant conditions are ALL of the reactor water level indicators invalid?

- a. RPV pressure 60 psig  
Containment temp EL 119' 200 degrees F
- b. RPV pressure 90 psig  
Drywell temperature EL 145' 300 degrees F
- c. RPV pressure 100 psig  
Drywell temperature EL 145' 360 degrees F
- d. RPV pressure 1000 psig  
Containment temperature EL 119' 180 degrees F

**ANSWER: C.**

**IDNO:** 214

NRC KA:	RO:	SRO:
295027 EK1.02	3	3.2
295028 EK2.03	3.6	3.8
295027 EK2.03	3.5	3.7

**LP #** HLO-511 **OBJ #** 6

**REFERENCES** EOP-0001 LEVEL 3  
Caution 1

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**QUESTION 11**

A Safety Relief Valve (SRV) tailpipe vacuum breaker was failed in the open position when the SRV opened. Which of the following is the result?

- a. Containment pressure increased.
- b. Steam bypassed the quenchers with a direct discharge path into the suppression pool.
- c. Drywell to containment differential pressure increased.
- d. Suppression pool water will be drawn up into the SRV discharge line after the SRV is closed.

**ANSWER: C.**

**IDNO:** 217

NRC KA:	RO:	SRO:
223001 A2.09	3.4	3.6
223001 K3.07	3.1	3.2

**LP #** HLO-007      **OBJ #** 3

**REFERENCES** P&ID 3-1B

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**QUESTION 12**

What is the PRIMARY reason that EOP-2, Primary Containment Control, requires emergency depressurization if you cannot maintain the suppression pool level below 21ft 3in?

- a. The capacity of the horizontal vents may be exceeded.
- b. The SRV discharge lines may fail allowing steam into containment.
- c. The suppression pool structural support limits will be exceeded.
- d. The pressure suppression feature of the quenchers cannot be assured.

**ANSWER: B.**

**IDNO:** 222

NRC KA:	RO:	SRO:
295029 EK3.01	3.5	3.9

**LP #**

**OBJ #**

**REFERENCES**

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**QUESTION 13**

Identify the PRIMARY reason that reactor power goes down when reactor water level is deliberately lowered during a failure to scram (ATWS) event.

- a. Further concentration of boron will result thus lowering the reactor power level.
- b. Decreased reactor pressure will add negative reactivity due to reduced moderator density.
- c. Increased core voiding will result from a decrease in natural circulation driving head and core flow.
- d. Increased reactor water temperature will result, adding negative reactivity due to reduced moderator density.

**ANSWER: C.**

**IDNO:** 235

NRC KA:	RO:	SRO:
295037 EK1.02	4.1	4.3
295037 EK3.03	4.1	4.5
295037 EA2.02	4.1	4.2

**LP #** HLO-512      **OBJ #** 5

**REFERENCES** EPSTG\*0002      LEVEL 3

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**QUESTION 14**

The plant is operating at 100% power. Both Recirc Flow Control Valves are in Flux Manual (Loop Auto) at 67% valve position. A leak in the Drywell has caused Drywell Pressure to increase to approximately 1.75 psid. Following the high drywell pressure signal, the "B" Reactor Feed Pump Trips and level decreases to + 14.5 inches and stabilizes. Which of the following describes the response of the Recirc Flow Control Valve?

Flow Control Valves will:

- a. runback to 22 % valve position.
- b. go to "min" position.
- c. move to a position to provide 60 % core flow.
- d. remain at 67 % valve position.

**ANSWER: D.**

**IDNO:** 244

NRC KA:	RO:	SRO:
202002 A2.08	3.3	3.3
295009 AK3.01	3.2	3.3

**LP #** HLO-005 **OBJ #** 4

**REFERENCES** ARP-P680-4-B03      LEVEL 3  
ARP-P680-4-B09  
ARP-P680-4-C04  
ARP-P680-4-C10

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**QUESTION 15**

A Reactor Recirc FCV runback has occurred.  
Recirc control valve percent limiter error is at zero.  
Valve demand indication is approximately 18%.

Which one of the following describes the response of the recirc system when the operator pushes the cavitation interlock reset pushbutton?

- a. The FCV runback annunciator will not reset because the motion inhibit has not been reset.
- b. The FCV runback annunciator will clear and the FCV position will remain at 18%.
- c. The FCV runback annunciator will clear, the FCV will begin moving but will be stopped by a FCV motion inhibit signal.
- d. The FCV runback annunciator will not reset until valve position and demand indications are matched.

**ANSWER: B**

**IDNO: 276**

NRC KA:	RO:	SRO:
202002 K4.06	3.1	3.1
202002 A3.01	3.6	3.4

**LP #**

**OBJ #**

**REFERENCES**

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**QUESTION 16**

The following plant conditions exist:

- The reactor is in cold shutdown.
- RHR "A" is in shutdown cooling.
- ENS\*SWG1B is deenergized for maintenance.

A RPV water level transient occurs resulting in RPV water level lowering to -120". Which of the following actions will result in LPCI "A" injecting into the RPV?

- a. Close the SDC suction valve F006A, open suction valve F004A from the suppression pool and restart the RHR A pump.
- b. Close the SDC suction valve F008, open suction valve F004A from the suppression pool, manually open F027A and F042A, and restart the RHR A pump.
- c. Close the SDC suction valve F006A, then arm and depress Div I LPCI initiation pushbutton.
- d. Close the SDC suction valve F006A, open the suction valve F004A from the suppression pool, then arm and depress Div I LPCI initiation pushbutton.

**ANSWER: D.**

**IDNO:** 278

NRC KA:	RO:	SRO:
203000 A4.05	4.3	4.1
203000 K2.03	2.7	2.9

**LP #** HLO-021 **OBJ #** 9

**REFERENCES** SOP-0031

LEVEL 3



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**QUESTION 17**

Which one of the following describes the response of the scram discharge volume valves following a half scram signal?

- a. Pilot air valves do not change position. Vent and drain valves remain open.
- b. One pilot air valve repositions, vent and drain valves remain open.
- c. Pilot air valves do not change position. One set of vent and drain valves close.
- d. One pilot air valve repositions causing vent and drain valves to close.

**ANSWER: A.**

**IDNO:** 290

NRC KA:	RO:	SRO:
212000 A2.19	3.8	3.9
212000 A1.08	3.4	3.4

**LP #**

**OBJ #**

**REFERENCES**

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**QUESTION 18**

Given the following information and the attached figure of the Turbine Electro-Hydraulic Control (EHC) System:

Averaging Manifold Pressure	950 psig
EHC Pressure Setpoint	920 psig
Load Limit	1040 MWE
Load Reference Setpoint	1060 MWE
Pressure Regulator A	Controlling

The "A" Main Steam Pressure transmitter (input to pressure regulator A) failed downscale to 0 psig.

Which ONE of the following describes the EHC system response?

- a. "A" Pressure Regulator remains in control; reactor pressure increases rapidly to the high pressure scram setpoint.
- b. "A" Pressure Regulator remains in control; reactor pressure decreases rapidly to the low pressure MSIV isolation setpoint.
- c. "B" Pressure Regulator takes control; reactor pressure remains constant.
- d. "B" Pressure Regulator takes control; reactor pressure increases 50 psig.

**ANSWER: C.**

**IDNO:** 321

NRC KA:	RO:	SRO:
241000 A2.01	3.5	3.7
241000 A4.02	4.1	4.1

**LP #**

**OBJ #**

**REFERENCES**

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**QUESTION 19**

The following plant conditions exist:

- A loss of offsite power has occurred with a failure of the Div I and Div II EDG to start and tie to their respective buses.
- SRVs are being used to control reactor pressure at 900 psig.
- RCIC is manually initiated (suction from the CST) and is maintaining reactor water level at approximately +20".

Suppression Pool rises and stabilizes at 20' 1"

WHICH ONE (1) of the following describes effect of the above conditions on the RCIC system and the reason for the alignment?

- a. RCIC suction remains on the CST since level in the Suppression Pool is below the suction transfer setpoint.
- b. RCIC suction remains on the CST. Although Suppression Pool level is above the suction transfer setpoint, the valves have failed to swap due to a loss of AC power.
- c. RCIC suction is from the Suppression Pool. Suppression Pool level is above the suction transfer setpoint and the DC powered valves swapped as designed.
- d. RCIC will trip on low suction pressure when the DC powered CST suction valve closed on Suppression Pool level and the AC powered Suppression Pool suction valve fails to open.

**ANSWER: A.**

**IDNO:** 340

NRC KA:	RO:	SRO:
217000 K6.01	3.4	3.5
217000 K1.01	3.5	3.5

**LP #**

**OBJ #**

**REFERENCES**



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**QUESTION 21**

Following a complete loss of shutdown cooling, temperature readings indicate a 1 degree F increase in bulk water temperature every 10 minutes. Assume the reactor vessel head is on, no other parameters change, and current temperature is 124 deg. F.

Which of the following is the maximum amount of time before primary containment **MUST** be established?

- a. 160 minutes
- b. 560 minutes
- c. 580 minutes
- d. 760 minutes

**ANSWER: D.**

**IDNO:** 369

NRC KA:	RO:	SRO:
295021 AA2.01	3.5	3.6
295021 AA2.04	3.6	3.6

**LP #** HLO-013      **OBJ #** 9

**REFERENCES** TS 3.6.1.2      LEVEL 2

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**QUESTION    22**

A MSIV isolation has occurred. The reactor has failed to scram. The COF has directed that Standby Liquid Control (SLC) be initiated. The initial SLC tank level was 2040 gallons.

WHICH ONE (1) of the following corresponds to the HIGHEST SLC tank level at which the minimum "Hot Shutdown Boron Weight" has been injected?

- a. 1472 gallons.
- b. 1412 gallons.
- c. 1372 gallons
- d. 807 gallons.

**ANSWER:    C..**

**IDNO:**            372

NRC KA:	RO:	SRO:
295037 EA1.04	4.5	4.5

**LP #**

**OBJ #**

**REFERENCES**    Encl 15

LEVEL 3

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**QUESTION    23**

RPV water level cannot be determined, RPV pressure is 100 psig, containment pressure is 20 psig, and 7 SRVs are open. RPV Flooding has just commenced.

Which one of the following conditions satisfy the MINIMUM amount of time that the RPV must be flooded?

- a. 19 minutes
- b. 20 minutes
- c. 39 minutes
- d. 30 minutes

**ANSWER:    D.**

**IDNO:**            403

NRC KA:	RO:	SRO:
295031 EA1.08	3.8	3.9

**LP #        HLO-512                    OBJ #        7**

**REFERENCES    EOP-4, RPV Flooding            LEVEL 2**

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**QUESTION 24**

A plant transient has occurred causing a complete isolation of the RWCU system.

- RWCU inboard and outboard isolation valves are closed.  
(G33-F001/F004/F028/F034/F039/F040/F053/F054)

Which of the following conditions caused this RWCU isolation?

- a. Drywell Pressure of 1.8 psid
- b. High Main Steam Tunnel Differential Temperature of 53 degrees fahrenheit
- c. RPV Level of -51 inches (Wide Range Indication)
- d. Initiation of SLC "A" system

**ANSWER: C.**

**IDNO:** 409

NRC KA:	RO:	SRO:
295020 AA2.06	3.4	3.8
2.4.4	4	4.3

**LP #** HLO-062 **OBJ #** 4

**REFERENCES** AOP-0003 LEVEL 3



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**QUESTION 25**

The plant is starting up following a refueling outage. The reactor has just achieved criticality. Which one of the following statements is true regarding the requirement for Shutdown Margin (SDM) determination?

- a. SDM must be determined within four hours of criticality.
- b. SDM must be determined before proceeding further with the startup.
- c. SDM need not be determined if no control rods were replaced.
- d. SDM need not be determined if it was determined analytically following the last fuel movement.

**ANSWER: A.**

NRC KA:	RO:	SRO:
2.2.12	3	4

**IDNO:** 412

**LP #** HLO-412 **OBJ #** 1

**REFERENCES** TS 3.1.1

LEVEL 2

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**QUESTION 26**

The plant was initially operating at 100% power. A transient occurred resulting in the following conditions:

- RPV level is 35 inches and stable
- Reactor power is 73% and stable
- Total core flow is 51.5 E6 lbm/hr. and stable

The cause of this plant configuration was the receipt of a signal from the:

- a. EOC-RPT logic.
- b. ATWS/ARI logic.
- c. recirculation pump cavitation interlock circuitry.
- d. recirculation flow control valve runback logic.

**ANSWER: D.**

**IDNO:** 419

NRC KA:	RO:	SRO:
202002 A2.01	3.4	3.4
295001 AK2.02	3.2	3.3
295001 AK3.06	2.9	3

**LP #** STM-053 **OBJ #** 2c

**REFERENCES** AOP-0024 LEVEL 3

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**QUESTION 27**

While operating at full power, an SRV sticks open, and repeated attempts to reseal it have so far been unsuccessful. Suppression Pool Temperature has stabilized at 104 deg F due to the combined effects of operating both loops of RHR in suppression pool cooling and power reduction.

What action should be taken next?

- a. Reduce reactor power to 25% using recirculation flow first and then control rods.
- b. Depressurize the RPV to less than 200 psig within 36 hours.
- c. Reduce Suppression Pool Temperature to less than 100 deg F within 24 hours.
- d. Immediately place the reactor mode switch in the SHUTDOWN position.

**ANSWER: C.**

**IDNO:** 430

NRC KA:	RO:	SRO:
2.1.33	3.4	4

**LP #** HLO-538      **OBJ #** 09

**REFERENCES** AOP-0035      LEVEL 3  
TS 3.6.2.1 A

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**QUESTION 28**

While the plant is at power, a leak develops in an area that is accessible, but now radiologically contaminated. The OSS has directed that an investigation be performed immediately. What documentation must be generated before various personnel are allowed entry into the area for the investigation?

- a. A daughter RWP to the General RWP for that area must be generated.
- b. None, a General RWP already exists for this type of event.
- c. A Specific RWP must be generated.
- d. None, a RWP may be completed after the entry provided it is done under continuous RP coverage.

**ANSWER: D.**

**IDNO:** 433

NRC KA:	RO:	SRO:
G 2.3.4	2.5	3.1

**LP #** GET-022      **OBJ #** 27

**REFERENCES** RSP-0200      LEVEL 2

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**QUESTION 29**

Given the following conditions:

- The plant is performing a reactor and plant startup, the reactor is critical
- Reactor power is 5.5 E4 counts per second (cps) on the Source Range Monitoring (SRM) instrumentation and is increasing
- SRM 'C' is failed upscale and bypassed on the P680 panel

The reactor operator selects and withdraws SRMs 'A', 'B', and 'D' and notices that SRM 'B' fails to withdraw and remains in the "Full In" position.

Which of the following describes Control Rod Withdrawal?

- a. Continued control rod withdrawal will be possible because the control rod withdrawal block logic is one-out-of-two-taken-twice for SRM detectors.
- b. Control rod withdrawal is blocked when power reaches 1.0 E5 cps and will be allowed when the two withdrawn SRM detector power levels drop below 100 cps.
- c. Control rod withdrawal will be allowed until power reaches 1.0 E5 cps and then will not be allowed until associated IRM power is at or above Range 3.
- d. Control rod withdrawal will be allowed until power reaches 1.0 E5 cps and then will not be allowed until associated IRM power is at or above Range 8.

**ANSWER: D.**

**IDNO:** 666

NRC KA:	RO:	SRO:
215004 K5.03	2.8	2.8

**LP #** STM-503 **OBJ #**

**REFERENCES**

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 30**

The plant has experienced an ATWS and the following conditions exist:

Reactor Power is 24%  
RPV water level is -110"  
Suppression Pool Level is 20' 6"  
Suppression Pool Temperature is 112 degrees farenheit  
SLC Tank Level is 2140 gallons

The CRS directed that SLC be initiated with the following results:

The "A" SLC Squib Valve fired, but the C41-F001A (Suction Valve) failed to open.  
The "B" SLC Squib Valve failed to fire, the "B" SLC Pump is running with suction from the SLC Tank.

Which one of the following is true concerning the boron injection into the reactor vessel:

- A. SLC Pump "B" is injecting into the RPV and Cold Shutdown Boron Weight will be injected when SLC Tank level reaches 800 gallons.
- B. Neither SLC Pump started and boron injection into the RPV must be accomplished via an alternate path per EOP-0005, Enclosure 15 and Cold Shutdown Boron Weight will be injected once 1000 lbs. Of Sodium Pentaborate has been mixed and pumped via HPCS.
- C. SLC Pump "A" started, tripped on low suction pressure. Boron injection into the RPV must be accomplished via an alternate path per EOP-0005, Ensloure 15 and Hot Shutdown Boron Weight will be injected once 1000 lbs. Of Sodium Pentaborate has been mixed and pumped via HPCS.
- D. SLC Pump "B" is injecting into the RPV and Cold Shutdown Boron Weight will be injected when SLC Tank level reaches 900 gallons.

**ANSWER: A.**

**IDNO:** 667

NRC KA:	RO:	SRO:
211000 A2.02	3.6	3.9

**LP #** HLO-016      **OBJ #** 6

**REFERENCES** EOP-0005, Encl. 15

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 31**

Given the following conditions:

- The plant is performing a scheduled shutdown
- Intermediate Range Monitoring (IRM) channel "H" has failed "UPSCALE" and has NOT been bypassed

At what point would an automatic half scram be expected for these conditions?

- a. The plant enters Mode 2.
- b. APRM "H" reaches 5% power.
- c. The IRM detectors are fully inserted.
- d. Power has decreased to the Low Power Setpoint.

**ANSWER: A.**

**IDNO:** 479

NRC KA:	RO:	SRO:
215003 K402	4	4
215003 A1.05	3.9	3.9

**LP #** STM-503 **OBJ #**

**REFERENCES**

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 32**

Which of the following is normally cooled by the Reactor Plant Component Cooling Water system on the Recirculation Pump shaft seal packages?

- a. The reactor coolant leaking from the Recirculation System into the lower seal cavity via the breakdown bushing.
- b. The reactor coolant flow directed to the Drywell Equipment Drain Sump from the seal package.
- c. Recirculation Pump Seal Purge Cooler.
- d. The Control Rod Drive Hydraulic System seal purge flow being directed to the Drywell Equipment Drain sump.

**ANSWER: C.**

**IDNO:** 488

NRC KA:	RO:	SRO:
202001 K1.07	3.1	3.2
201001 K3.01	3	3.1

**LP #** STM-053      **OBJ #** 01

**REFERENCES**



**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 33**

Given the following conditions:

- The plant is operating at 85% power
- The At-The-Controls Operator has just depressed the "Transfer To LFMG" pushbuttons for transferring the Recirculation Pumps to "slow" speed
- The Operator reports that the CB5A breaker opened but the CB5B breaker did NOT open

Which of the following describes the expected status of the Recirculation Pumps 20 seconds after this failure?

- A. Both Recirc Pumps will be coasting to a stop
- B. The "A" Recirc Pump will be running in "slow" speed, the "B" Recirc Pump will be running in "fast" speed.
- C. The "A" Recirc Pump will be running in "slow" speed, the "B" Recirc Pump will be coasting to a stop.
- D. The "A" Recirc Pump will be coasting to a stop, the "B" Recirc Pump will be running in "fast" speed.

**ANSWER: D.**

**IDNO:** 489

NRC KA:	RO:	SRO:
202001 A3.08	3.4	3.3
202001 A4.01	3.7	3.7

**LP #** STM-053      **OBJ #** 02

**REFERENCES** ARP-680-4A-D01 D07

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 34**

Following a normal reactor scram, at what point must the At-The-Controls Operator be alert for narrow range reactor water level indication “outgassing” or “notching”? (Assume the Reference Leg Backfill system is NOT in service.)

- A. When reactor coolant temperature drops below 190 degrees fahrenheit.
- B. When reactor power is reduced below the Low Power Setpoint (LPSP).
- C. When the last Feed Pump is removed from service.
- D. As reactor pressure decreases below 450 psig.

**ANSWER: D.**

**IDNO:** 496

NRC KA:	RO:	SRO:
295006 AK3.01	3.8	3.9
295006 AA1.06	3.5	3.6

**LP #** HLO-501 **OBJ #**

**REFERENCES** GOP-002

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 35**

Given the following conditions:

- The plant is operating at 30% power
- Suppression pool cooling is in service
- The surveillance test for manual operation of the Safety Relief Valves (SRV) is in progress
- During the surveillance, suppression pool temperature reached 103 °F

Which of the following are the requirements concerning entry into/implementation of EOP-2, "Primary Containment Control"?

- A. The SRV surveillance procedures allow 4 hours to reduce suppression pool temperature below 100 °F before EOP-2 entry is required.
- B. EOP-2 may be deferred for 24 hours while suppression pool temperature is reduced to less than 100°F.
- C. Technical Specifications modify the Emergency Operating Procedure limit to 110 °F while surveillance testing to the suppression pool is occurring.
- D. The actions of EOP-2 are required to be performed as soon as suppression pool temperature is above 100 °F.

**ANSWER: D.**

**IDNO:** 501

NRC KA:	RO:	SRO:
295013 A1.02	3.9	3.9
219000 A4.12	4.1	4.1

**LP #** HLO-514      **OBJ #** 03

**REFERENCES** EOP-2

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 36**

A plant transient has occurred with a failure of the reactor to scram. Plant conditions are as follows:

- Reactor Power is 10%
- RPV Water Level is -60 inches
- EOP-1A is being executed for ATWS RPV Control
- Immediate actions of AOP-0001, Reactor Scram are complete

The following indications are available on Panel P680:

- "RPS DIV 1, 2, 3, and 4 SCRAM SOV VALVES OPEN" white lights are OFF
- Annunciator P680-5A-C08 (Scram Pilot VLV Air Header Low Pressure) is IN ALARM
- Annunciator P680-6A-A08 (CRD Scram Disch Vol High Water Level) is NOT IN ALARM
- Annunciator P680-7A-D03 (ARI Initiated) is IN ALARM

Which one of the following Alternate Control Rod Insertion methods will be most effective under these conditions?

- A. Deenergizing the scram solenoids per EOP-0005, Enclosure 10
- B. Venting the scram air header per EOP-0005, Enclosure 11
- C. Venting the CRD overpiston volumes per EOP-0005, Enclosure 17
- D. Initiating ARI (defeating logic trips per EOP-0005, Enclosure 12, if necessary)

**ANSWER: C.**

**IDNO:** 668

NRC KA:	RO:	SRO:
295015 EK3.01	3.4	3.7

**LP #** HLO-513 **OBJ #** 4

**REFERENCES** EPSTG-0001A  
EOP-0005, Encl. 26

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 37**

Which of the following is a consequence of allowing suppression pool water level to decrease below 13 feet?

Suppression pool water level less than 13 feet:

- A. uncovers the Reactor Core Isolation Cooling turbine exhaust line.
- B. reduces the available net positive suction head for the low pressure ECCS pumps below minimum required.
- C. uncovers the top two horizontal vents.
- D. could result in overpressurization of the Containment.

**ANSWER: D.**

**IDNO:** 513

NRC KA:	RO:	SRO:
295030 AK1.03	3.8	4.1

**LP #** HLO-514      **OBJ #** 05

**REFERENCES** EOP-0002  
EPSTG-0002

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 38**

While operating in EOP-3, "Radioactive Release Control", the operator is directed to restart Turbine Building Ventilation if it is shutdown.

Which of the following describes how this will affect the Turbine Building and the release that is occurring?

Restarting Turbine Building Ventilation will:

- A. ensure that all building releases will be maintained less than the limits of 10CFR20.
- B. ensure that all building releases will be maintained less than the limits of 10CFR100.
- C. maintain a positive pressure inside the building.
- D. assure overall radioactive releases will be monitored.

**ANSWER: D.**

**IDNO:** 520

NRC KA:	RO:	SRO:
295038 EA1.06	3.5	3.6
295038 EA2.04	4.1	4.5

**LP #** HLO-515 **OBJ #** 04

**REFERENCES** EOP-3  
EPSTG-0002

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 39**

Given the following conditions:

- The plant is operating at 75% power
- The Steam Seal Evaporator has just been lost
- There is NO time estimate for return of the evaporator

SELECT the appropriate operator actions for the above conditions.

- A. Reduce turbine load as necessary to maintain the self-sealing steam supply to the turbine glands.
- B. Transfer the Recirculation Pumps to “slow” speed and maintain power within bypass valve capacity.
- C. Reduce power as required to prevent condenser vacuum from decreasing to less than 25 in Hg.
- D. Transfer the Recirculation Pumps to “slow” speed and then trip the main turbine.

**ANSWER: C.**

**IDNO:** 524

NRC KA:	RO:	SRO:
295002 AA1.08	2.6	2.7
295002 AA2.01	2.9	3.1

**LP #** HLO-524 **OBJ #** 04

**REFERENCES** AOP-0005

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 40**

The plant was operating at 75% rated power when a loss in instrument air occurred. The source of the air loss has been identified and isolated. The following conditions exist:

- Reactor power is steady at 75% power
- RPV Water Level is 32" and steady
- Feedwater level control is in automatic on the Master Controller with a tape set of 36"
- Instrument Air Header pressure is 67 psig and is steady (67 psig was the lowest pressure reached)
- No control rods have drifted
- All immediate actions of AOP-0008 have been taken
- The At-The-Controls Operator depresses the Feedwater Regulating Valve reset pushbuttons

What will be the expected result for this action?

Reactor water level will:

- A. rapidly increase and a reactor scram will occur at Level 8.
- B. rapidly decrease and a reactor scram will occur at Level 3.
- C. remain at 32".
- D. return to the 36"

**ANSWER: A.**

**IDNO:** 528

NRC KA:	RO:	SRO:
295019 AK2.03	3.2	3.3
295019 AA2.02	3.6	3.7

**LP #** HLO-060 **OBJ #** 06

**REFERENCES** AOP-0008



**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 41**

The plant was operating at 100% rated power when a loss of Feedwater caused an automatic scram signal on RPV Level 3 (+9.7 inches). Plant conditions are as follows:

- A failure to scram has occurred (ATWS)
- Annunciator P601-20A-B06 (AIR TEMP MON R611 RHR EQPT AREA HI DIFF VENT TEMP) was received and the Reactor Building has reported a fire in RHR "A" Pump Room.
- Reactor Power is 15%, with control rods being inserted per EOP-0005, Enclosure 14
- RPV water level is being controlled between -60 inches and -100 inches with Condensate/Feedwater

Which one of the following systems should be isolated, if found to be discharging into the Auxiliary Building?

- A. Feedwater System
- B. Fire Suppression Systems
- C. Reactor Water Cleanup System
- D. Control Rod Drive Hydraulics System

**ANSWER: C.**

**IDNO:** 669

NRC KA:	RO:	SRO:
295032 EA2.03	3.8	4

**LP #** HLO-515      **OBJ #** 4

**REFERENCES** EOP-0003  
EOP-001A

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 42**

The plant is operating at 100 % power when a short circuit occurs on the DC bus supplying power for ATWS ARI/RPT. This causes all of the power supply breakers to BYS-PNL02A2 to trip, resulting in a loss of power to ATWS ARI/RPT.

Which one of the following describes the response of the ARI system and the Reactor Recirculation Pumps?

- A. ARI will not function, however the Reactor Recirculation pumps will trip to OFF immediately.
- B. ARI will actuate causing a depressurization of the scram air header and the Reactor Recirculation pumps will trip to OFF immediately.
- C. ARI will not function and the Reactor Recirculation pumps will not trip on an ATWS condition.
- D. ARI will actuate causing a depressurization of the scram air header on an ATWS condition, however the Reactor Recirculation pumps will not trip.

**ANSWER: C**

**IDNO:** 539

NRC KA:	RO:	SRO:
295004 AK2.03	3.3	3.3
295004 AA2.02	3.5	3.9

**LP #** STM-052      **OBJ #** 2D

**REFERENCES** PRINTS  
CFR 41.7

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 43**

The plant was operating at 100% power at the beginning of the transient.

The At-The-Controls Operator observes the following indications.

- “Control Rod Drift” annunciator P680-7A-B02 in alarm
- “Rod Drift” pushbutton on P680 back-lit
- “Accumulator Trouble” annunciator P680-7A-C03 in alarm
- “Accum Fault” pushbutton on P680 back-lit
- “Ackn Accum Fault” pushbutton on P680 back-lit
- “Scram Valves” pushbutton on P680 back-lit
- APRM power 97 %

Which one of the following plant conditions was the probable cause?

- A. Single control rod drifting inward.
- B. Single control rod drifting outward.
- C. Control Rod Drop Accident
- D. Single control rod scram.

**ANSWER: D**

**IDNO:** 544

**LP #** HLO-057 **OBJ #** 7

**REFERENCES** ARP-P680-07-B02 CFR 41.6  
ARP-P680-07-C03

NRC KA:	RO:	SRO:
201005 AA3.01	3.5	3.5
201005 AA3.02	3.5	3.5
201005 AA3.04	3.3	3.3
295014 AK2.09	3.4	3.6

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 44**

RBS is operating at 10% rated power with the mode switch in the STARTUP position, and total core flow at 53%. APRM E and H are bypassed due to failed power supplies.

The following is the present status of the APRMs versus LPRM inputs and indicated power:

APRM:	A	B	C	D	E	F	G	H
LPRM LVL D:	3	4	2	2	2	3	3	3
LPRM LVL C:	4	3	3	4	4	4	4	4
LPRM LVL B:	2	4	4	3	2	3	3	2
LPRM LVL A:	4	2	2	4	4	4	2	4
INDICATED PWR:	10%	13%	12%	14%	0%byp	11%	13%	0% byp

LPRM 22-39D has failed downscale and must be bypassed to allow troubleshooting.

With present conditions would this action be allowed?

Attached is the LPRM vs. APRM assignments Attachment of SOP-0074.

- A. Yes, conditions are satisfactory.
- B. Yes, however an Tracking (ONLY) LCO would have to be written on the associated APRM for Administrative inputs.
- C. No, this action would result in a half scram and administrative LCO requirements not to be met.
- D. No, this action would result in a full reactor scram.

**ANSWER: C**

**IDNO:** 545

**LP #** STM-503 **OBJ #** 22

**REFERENCES** SOP-0074  
REP-0037  
TS 3.3.1.1.2  
CFR 41.6

NRC KA:	RO:	SRO:
215005 A1.04	4.1	4.1
215005 A1.02	3.9	4
215005 A1.03	3.6	3.6
215005 K3.01	4	4

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 45**

The plant is in Mode 4 with RHR "A" in Shutdown Cooling. A misalignment of RPV drain valves has resulted in reactor vessel level lowering. The following are the present plant parameters:

Reactor Pressure: 0 psig  
Reactor Water Level: +34 inches and lowering  
Reactor Water Temperature: 160 degrees Fahrenheit  
Drywell Pressure: 0 psig

Which one of the following describes the operation of the RHR "A" Shutdown Cooling System if Reactor Water Level continues to lower?

- A. At + 9.7 inches RPV water level, E12-F053A (RHR A SDC Injection Valve) will isolate, which will cause a low flow on the RHR A pump automatically opening E12-F064A (RHR Pump A Min Flow to Sup Pl).
- B. At + 9.7 inches RPV water level, E12-F053A (RHR A SDC Injection Valve), E12-F008 and F009 (RHR Shutdown Cooling Isol Valves) will isolate causing the RHR A Pump to trip.
- C. At +31 inches RPV water level, E12-F006A (RHR Pump A SDC Suction Valve) will isolate, which will cause E12-F004A (RHR Pump A Sup Pl Suction Valve) to open and the low flow on the RHR A pump to open the E12-F064A (RHR Pump A Min Flow to Sup Pl).
- D. At +31 inches RPV water level, E12-F008 and F009 (RHR Shutdown Cooling Isol Valves) will isolate, which will cause the RHR A pump to trip; the RHR A pump trip will cause E12-F053A (RHR A SDC Injection Valve) to close.

**ANSWER: B**

**IDNO:** 547

NRC KA:	RO:	SRO:
205000 A2.05	3.5	3.7
205000 A2.06	3.4	3.5
205000 K6.04	3.6	3.6

**LP #** **OBJ #**

**REFERENCES** SOP-0031  
AOP-0003  
CFR 41.7

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 46**

The following stable conditions exist in the plant:

- Reactor Power: 0 % (All Rods In)
- Reactor Pressure: 130 psig
- Reactor Water Level: + 4 inches
- Drywell Pressure: 1.8 psig
- Main Steam Tunnel Temperature: 138 degrees Fahrenheit
- Reactor Mode Switch: SHUTDOWN

Given the above plant conditions, determine which one of the following describes the systems which should have received isolation signals.

- A. CCP; MSIVs; RCIC; RWCU
- B. MSIVs; RCIC; RHR to Radwaste; RWCU
- C. CCP; RHR; Recirc Sample lines
- D. MSIVs; Reactor Sample lines; RHR to Radwaste

**ANSWER: C**

**IDNO:** 552

NRC KA:	RO:	SRO:
223002 A1.02	3.7	3.7
223002 A3.02	3.5	3.5

**LP #** HLO-062 **OBJ #**

**REFERENCES** AOP-0003  
CFR 41.7  
CFR 41.9

**U.S. NUCLEAR REGULATORY COMMISSION  
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**QUESTION 47**

The plant is operating at 4 % power in a reactor startup. The B CRD pump is tagged out with the oil sump drained for maintenance.

The A CRD pump trips. The CRS dispatches a SNEO to investigate the pump circuit breaker. The SNEO reports that the breaker has over current trip flags and the lockout device is tripped.

Electrical Maintenance is called to investigate.

The following parameters are indicated in the Main Control Room:

- Reactor Pressure: 450 psig
- Reactor Water Level: + 34 inches
- Main Steam Bypass valves are fully closed.

With present plant conditions, which one of the following describes the actions to be taken?

- A. Increase reactor pressure to > 600 psig and wait for electrical maintenance to repair the CRD Pump.
- B. If two or more control rod accumulator faults exist on withdrawn control rods, fully insert the control rods within 20 minutes or place the reactor mode switch in SHUTDOWN.
- C. If one or more control rod accumulator faults exist on withdrawn control rods, which cannot be inserted, immediately place the reactor mode switch in SHUTDOWN.
- D. Increase reactor pressure to > 600 psig, and restore charging water header pressure to >1520 psig within 20 minutes or place the reactor mode switch in SHUTDOWN.

**ANSWER: C**

**IDNO: 560**

NRC KA:	RO:	SRO:
295022 AK3.01	3.7	3.9
295022 AK1.02	3.6	3.7

**LP #**

**OBJ #**

**REFERENCES** ARP-P601-22A-A01  
TS 3.1.5  
CFR 41.5  
CFR 41.6  
CFR 43.2

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 48**

The plant is operating at 90 % power.

Which one of the following descriptions of plant conditions will result in a Main Turbine Trip and describes the basis for the trip?

- A. The Main Turbine will trip when the selected Reactor Narrow Range Level Instruments has level at + 51 inches. This is to prevent the erosion of the Main Steam piping and Main Control Valves' seats, from moisture carryover.
- B. The Main Turbine will trip when two of the Reactor Narrow Range Level Instruments have level at + 51 inches. This is to prevent the erosion of the Main Steam piping and Main Control Valves' seats, from moisture carryover.
- C. The Main Turbine will trip when two of the Reactor Narrow Range Level Instruments have level at + 51 inches. This is to prevent the erosion of the Main Turbine blades, from moisture carryover.
- D. The Main Turbine will trip when the selected Reactor Narrow Range Level Instruments has level at + 51 inches. This is to prevent the erosion of the Main Turbine blades, from moisture carryover.

**ANSWER: C**

**IDNO:** 561

NRC KA:	RO:	SRO:
295008 AK1.01	3	3.2
295005 AA2.07	3.5	3.6
295008 AK2.03	3.6	3.7

**LP #** **OBJ #**

**REFERENCES** AOP-0002  
TRM 3.3.7.3  
CFR 41.5



**U.S. NUCLEAR REGULATORY COMMISSION  
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**QUESTION 49**

The plant is operating at 100 % power. A leak on the Service Water Header in the Drywell requires the isolation of the Service Water piping inside the Drywell.

Which one of the following describes the reaction of the plant to this isolation?

- A. Drywell temperature will rise along with Drywell pressure such that eventually the scram and isolation setpoint for Drywell pressure will be reached.
- B. Drywell temperature will remain stable due to the evaporation of water inside the Drywell sumps absorbing heat energy.
- C. Drywell temperature will rise and stabilize at the point where evaporation of the water in the Drywell will absorb the heat and Drywell pressure will stabilize < 1.68 psig.
- D. Drywell temperature will remain stable due to the continued circulation of the Drywell atmosphere through the Drywell Coolers and the transfer of heat to any residual water remaining in the Service Water piping.

**ANSWER: A**

**IDNO: 574**

NRC KA:	RO:	SRO:
295010 AK2.05	3.7	3.8
295010 AA1.07	3.2	3.4

**LP # STM-118      OBJ # 7**

**REFERENCES**    SOP-0060  
                      AOP-009  
                      CFR41.4  
                      CFR41.9

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 50**

The plant is at 5 % power. Chemistry samples taken indicate that fuel damage is present in the core. Radiation levels in Offgas and the Main Steam lines have risen drastically.

Which one of the following describes the reaction of the plant if the Main Steam Line Radiation Levels reach 3 times the normal background readings?

- A. The Reactor will scram, the Main Steam Lines and the Reactor Sample Lines will isolate, and the Condenser Air Removal Pumps will trip.
- B. Initiation of Standby Gas Treatment and Annulus Mixing, and an isolation of the Main Steam Lines and Reactor Sample Lines.
- C. The Reactor Sample Lines will isolate and the Condenser Air Removal Pumps will trip and isolate.
- D. The Reactor will scram, Standby Gas Treatment and Annulus Mixing will initiate, and the Condenser Air Removal Pumps will isolate.

**ANSWER: C**

**IDNO: 575**

NRC KA:	RO:	SRO:
295033 EK3.03	3.8	3.9
295033 EA2.01	3.8	3.9

**LP #**

**OBJ #**

**REFERENCES** AOP-0003  
CFR 41.11  
CFR 41.12  
CFR 43.4

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 51**

The plant is conducting a reactor startup (Mode 2) when due to an error by I&C HPCS initiated. The HPCS Injection Valve has been overridden closed.

Operators and technicians are unable to reset the initiation trip units for HPCS.

RPV Water Level is currently reading +36 inches on Narrow Range Indication.

The following indications were the highest values recorded for RPV Level:

- Narrow Range Level: +55 inches
- Wide Range Level: +48 inches

Which one of the following is correct concerning the operation of the HPCS Injection Valve (E22\*F004)?

- A. The valve can ONLY be opened using the valve hand switch in the OPEN position on P601.
- B. The valve can ONLY be opened if the HPCS High Reactor Water Level signal is manually reset and the valve hand switch is taken to the OPEN position.
- C. The valve will automatically open if the HPCS Manual Initiation Pushbutton on P601 is depressed.
- D. The valve will automatically open if RPV water level drops to Level 2 (-43") as indicated on wide range level indication.

**ANSWER: A.**

**IDNO:** 670

NRC KA:	RO:	SRO:
209002 K3.01	3.9	3.9

**LP #**

**OBJ #**

**REFERENCES**    SOP-0030                      CFR 41.7  
                      ARP-P601-16A-B04        CFR 41.8  
                      ARP-P601-16A-F02

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**QUESTION 52**

All Power to the Division I DC bus has been lost.

Concerning the Low Pressure Core Spray System operation, which one of the following statements is true?

- A. In the event of an actual LOCA condition, LPCS will NOT operate automatically, however, the system can be manually initiated from the Main Control Room and inject into the Reactor.
- B. In the event of an actual LOCA condition, LPCS will automatically start, however, the injection valve must be manually opened due to the loss of the automatic opening feature of the pressure permissive.
- C. Low Pressure Core Spray is unable to be initiated manually or automatically, however, the LPCS pump can be manually started from the Main Control Room and placed on minimum flow or can be aligned for injection.
- D. Low Pressure Core Spray is unable to be initiated manually or automatically, and the LPCS pump will not operate from the Main Control Room, if the pump is started locally, it will operate on minimum flow.

**ANSWER: D**

**IDNO: 588**

NRC KA:	RO:	SRO:
209001K2.03	2.9	3.1
209001 K6.02	3.8	3.9

**LP #**

**OBJ #**

**REFERENCES** ARP-P601-21A-H08  
828E535AA SHT 3,4,6,  
ESK5CSL01  
ESK6CSL01  
CFR 41.7  
CFR 41.8

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**QUESTION 53**

The unit was operating at 100% rated power when a steam leak in the Drywell occurred. Plant conditions are as follows:

- Reactor is scrammed (0%) all rods are in
- Drywell pressure is 1.8 psig and steady
- Six (6) Drywell Unit Coolers are running
- RPV level is + 36"
- RPV Pressure is 600 psig (Pressure Band of 500 psig to 800 psig)
- All AOP-0003 (Automatic Isolations) automatic isolations and initiations have been verified.
- Standby Gas Treatment Train "A" is operating
- Standby Gas Treatment Train "B" is back in standby

A valid High-High Annulus Exhaust Radiation signal is received on both Division I and Division II.

Which one of the following statements is true concerning Standby Gas Treatment (SBGT) system?

- A. The "A" SBGT train will remain operating and the "B" SBGT train will remain in standby.
- B. The "A" SBGT train will shutdown, then both SBGT trains will re-initiate.
- C. The "B" SBGT train will automatically restart from standby.
- D. Both SBGT trains will shutdown and isolate awaiting further operator action.

**ANSWER: A.**

**IDNO:** 671

NRC KA:	RO:	SRO:
261000 K1.01	3.4	3.6

**LP #** **OBJ #**

**REFERENCES** ESK06GTS01 CFR41.13  
ESK06GTS02  
SOP-0043  
SOP-0059  
ARP-P863-71A-C07  
ARP-P863-71A-G07  
ARP-P863-73A-C04  
ARP-P863-73A-D05  
ARP-P863-73A-E05  
ARP-P863-73A-F04

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**QUESTION 54**

The plant is operating at 100 % power. Condensate Pump CNM –P1B has tripped on over-current.

The pressure at the suction of the Reactor Feed Pumps has dropped to 200 psig for 18 seconds.

Which one of the following would be the response of the Reactor Feed Water System?

- A. The Feed Reg Valves will throttle back to increase suction pressure resulting in a low Reactor Level.
- B. The “A” Reactor Feed Pump will trip and cause Reactor Feed Pump suction pressure rise.
- C. The “A and B” Reactor Feed Pumps will trip and cause a Reactor scram on low Reactor Level.
- D. All three Reactor Feed Pumps will trip causing Reactor Level to lower and result in a Reactor scram.

**ANSWER: C**

**IDNO: 595**

NRC KA:	RO:	SRO:
259001A3.10	3.4	3.4
259001 A3.07	3.2	3.2

**LP #**

**OBJ #**

**REFERENCES** ARP-P680-03A-A01 CFR 41.4

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**QUESTION 55**

The plant is operating at 100 % power when B21-AOVF028B, an outboard MSIV fails closed due to a rupture of the valve actuator air supply.

Which one of the following describes the response of the reactor?

ASSUME NO OPERATOR ACTION.

- A. RPV pressure will increase and stabilize at a higher pressure.  
Reactor power will increase and stabilize at a higher power.  
RPV water level will decrease and then return to normal level.
- B. RPV pressure will increase and then decrease following the scram.  
Reactor power will increase and cause a reactor scram on power.  
RPV water level will decrease and then stabilize at a lower level.
- C. RPV pressure will decrease and stabilize at a lower pressure.  
Reactor power will decrease and stabilize at a lower power.  
RPV water level will increase and then return to normal level.
- D. RPV pressure will decrease and stabilize at a lower pressure.  
Reactor power will increase and return to the original power.  
RPV water level will increase and then return to normal level.

**ANSWER: B**

**IDNO:** 599

NRC KA:	RO:	SRO:
295007 AK1.03	3.8	3.9

**LP #**

**OBJ #**

**REFERENCES** USAR 15.2.4.1.2.2

CFR 41.5  
CFR 41.14

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**QUESTION 56**

The Unit Operator notices the AUX BLDG FL DRAIN SUMP LEVEL EXTREME HIGH/LOW ANNUNCIATOR (P870-51A-G3) is in alarm.

The Auxiliary Building SNEO has reported the sump level in the HPCS Pump Room is overflowing onto the floor.

Which one of the following describes the expected equipment operation and procedural requirements?

- A. Both sump pumps should be operating and the Control Room Supervisor should be entering EOP-0003 for Secondary Containment Control.
- B. Only one of the sump pumps should be operating and the Auxiliary Building Operator should be locating the source of the leakage.
- C. Both sump pumps should be operating and the Control Room Supervisor should evacuate the Auxiliary Building.
- D. Only one of the sump pumps should be operating and the Control Room Supervisor should be entering EOP-0003 for Secondary Containment Control.

**ANSWER: A**

**IDNO:** 606

NRC KA:	RO:	SRO:
295036 EK3.04	3.4	3.8
295036 EK2.01	3.1	3.2

**LP #**                      **OBJ #**

**REFERENCES**    EOP-0003  
                        ARP-P870-51A-G03  
                        CFR 41.4



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**QUESTION 57**

The plant has scrammed due to a loss of offsite power.

HPCS and RCIC WILL NOT start.

Approximately 5 minutes after RPV water level decreases below – 143 inches, the “DIV 2 ADS LOGIC TIMER INITIATED” annunciator illuminates.

The Unit Operator is directed to “INHIBIT ADS” per EOP-0001.

Later the Unit Operator Arms and Depresses the ADS B MANUAL INITIATION pushbuttons.

What is the response of the ADS System in this situation?

ADS will initiate:

- A. immediately, if any DIV II low pressure ECCS subsystem pressure permissive is satisfied.
- B. in 105 seconds, if any DIV II low pressure ECCS subsystem pressure permissive is satisfied.
- C. immediately, regardless of low pressure ECCS subsystem status.
- D. in 105 seconds, regardless of low pressure ECCS subsystem status.

**ANSWER: A**

**IDNO:** 617

NRC KA:	RO:	SRO:
218000 A4.02	4.2	4.2
218000 K4.01	3.7	3.9

**LP #**

**OBJ #**

**REFERENCES** ARP-P601-19A-A10 CFR 41.7

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**QUESTION 58**

The plant has scrammed.

Reactor level has dropped to – 50 inches and is recovering.

Reactor pressure is being controlled with Turbine Bypass Valves.

Which one of the following describes the response of the Control Room Ventilation System?

- A. Normal outside air intakes close, the air inside the Control Room is just recirculated until the ventilation system is reset.
- B. Outside air intakes remain open with the charcoal filter train drawing from the control room and exhasts to the outside atmosphere.
- C. Normal outside air intakes close, remote outside air is supplied to the control room.
- D. Outside air is filtered through the charcoal filtration trains before it is supplied to the control room.

**ANSWER: D**

**IDNO:** 619

NRC KA:	RO:	SRO:
290003 A3.01	3.3	3.5
290003 K1.03	2.8	2.9

**LP #** HLO-049 **OBJ #** 11

**REFERENCES** TS 3.3.7.1 CFR 41.4

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**QUESTION 59**

One result of the RPV Level 1 LOCA signal is the shedding of loads, and the subsequent sequencing back on of required loads. The purpose for this automatic action can be summarized by:

- A. Sequencing safety related loads minimizes the time the diesel generator runs in an unloaded condition.
- B. Shedding loads allows time for the diesel generator to warm up prior to placing loads on the bus.
- C. Sequencing safety related loads ensures that starting current loads do not overload the diesel generator.
- D. Shedding loads ensures that non essential loads do not operate in an unmonitored condition for long periods of time.

**ANSWER: C**

**IDNO: 635**

NRC KA:	RO:	SRO:
2.1.28	3.2	3.3
264000 K5.06	3.4	3.5

**LP #**

**OBJ #**

**REFERENCES TS 3.8.1**

**CFR 41.7**

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**QUESTION 60**

A Loss of Coolant Accident has occurred. The core has been uncovered and reactor water level cannot be determined.

The following plant parameters exist:

Reactor Pressure: 150 psig  
Containment Pressure: + 8.5 psig  
Drywell Pressure: + 16.5 psig  
Drywell Hydrogen Concentration: 4.5%  
Containment Hydrogen Concentration: 5.5%

Which one of the following describes the methods to be used to control Hydrogen Concentrations in the Containment and Drywell?

- A. Hydrogen Recombiners, Igniters, and Mixing Systems
- B. Hydrogen Igniters, and Normal CTMT Vent and Purge
- C. Normal CTMT Vent and Purge
- D. Hydrogen Recombiners, and Igniters

**ANSWER: D.**

**IDNO:** 652

NRC KA:	RO:	SRO:
500000 EA1.03		3.2
2.4.14	3	3.9
500000 EK2.05	3.2	3.3

**LP #** **OBJ #**

**REFERENCES** EOP-2, H2 Control CFR 41.10  
CFR 43.5

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**QUESTION 61**

The plant is operating at 100% power.

Standby Gas Treatment Filter Train "A" is being operated for surveillance testing.

The Auxiliary Building Operator reports smoke coming from the "A" Standby Gas Treatment Filter Train and the filter train case is glowing red.

Which one of the following describes the method to combat a fire in the Standby Gas Treatment Filter Train?

- A. The Fire Protection System will initiate the automatic deluge system and fill the filter train with water.
- B. The Fire Protection System will automatically open, however, the isolation valves must be opened manually to admit water to the filter train.
- C. The Fire Protection system Deluge Valve will have to be manually initiated via the pull station to admit water to the filter train.
- D. The Fire Protection System at the filter train must be manually valved into the deluge system to admit water to the filter train.

**ANSWER: D.**

**IDNO:** 654

NRC KA:	RO:	SRO:
600000 AK1.02	2.9	3.1
600000 AA1.05	3	3.1

**LP #** **OBJ #**

**REFERENCES** SOP-0037

CFR 41.10  
CFR 43.5

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**QUESTION 62**

The plant is operating at 100% power with a severe thunderstorm in progress.

The National Weather Service has issued a Tornado Watch for West Feliciana Parish.

The Operating Shift has Minimum shift Staffing per Technical Specifications.

A fire breaks out in the Standby Cooling Tower Switchgear Room "A", and all operators are dispatched to support extinguishing the fire. An operator is stationed at the Division I and II Diesel Generators per Standing Order #154.

Which one of the following describes actions to be taken by the Operations Shift Superintendent with regard to using the Diesel Operator to fight the fire?

- A. The OSS may revise the Standing Order and dispatch the operator to assist with the fire.
- B. There is NO deviation allowed from the Standing Order.
- C. The OSS may deviate from the Standing Order, provided he notify the General Manager, Plant Operations as soon as possible.
- D. After notification of the NRC Operations Center, the OSS may deviate from the Standing Order.

**ANSWER: A.**

**IDNO:** 661

NRC KA:	RO:	SRO:
2.1.15	2.3	3

**LP #**                      **OBJ #**

**REFERENCES**    ADM-0022                      CFR 41.10  
                         AOP-0029                      CFR 43.5  
                         Stand. Order 154  
                         OSP-0003

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**QUESTION 63**

The plant has experienced a Loss of Coolant Accident due to a complete break of the Recirculation System piping.

Which one of the following describes the initial response of Drywell and Containment Pressure?

- A. Drywell pressure will rise to a maximum value clearing all Drywell to Containment Vents releasing steam directly into the Containment pressurizing Containment to a maximum value.
- B. Drywell pressure will rise to a maximum value clearing all Drywell to Containment Vents causing a rise in Containment Pressure followed by a lowering of Drywell pressure and recovering of the Drywell vents.
- C. Drywell pressure will rise to greater than the ECCS and ADS initiation setpoints causing ECCS and ADS depressurization of the reactor to the Suppression Pool, resulting in a slight rise of Containment Pressure.
- D. Drywell pressure will rise to greater than the ECCS initiation setpoints causing ECCS injection and collapse of the steam bubble, removing the driving head of Reactor pressure, resulting in a turn of Drywell pressure and a slight rise in Containment Pressure.

**ANSWER: B.**

**IDNO:** 663

**LP #** HLO-013 **OBJ #** 3d

NRC KA:	RO:	SRO:
295024 EA2.09		4.1
295024 EA2.01		4.4
295024 EA2.03		3.8
295024 EK3.06	4	4.1

**REFERENCES** USAR 6.2.1.1.3.1.5.2 CFR 41.9  
USAR Table 6.2-7  
USAR Table 6.2-11

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**QUESTION    64**

The plant is shutdown, mode 5, with refueling operations in progress. While transferring an irradiated spent fuel bundle from the IFTS transfer canal to its storage location in the Spent Fuel Pool the bundle is inadvertently dropped. Prior to dropping the fuel bundle, Fuel Building Exhaust Filter Train A (HVF-FLT2A) was in service to support refueling operations.

Shortly after the bundle is dropped, the refueling team in the Fuel Building reports that there are gas bubbles rising from the Spent Fuel Pool in the vicinity of the dropped bundle and the following annunciators are received in the Main Control Room on panel P863:

- DIV 1 FUEL BLDG EXH PAM GASEOUS RADN ALARM (H13-P863/75A/H01)
- DIV 2 FUEL BLDG EXHAUST RADN ALARM (H13-P863/75A/H03)

Which one (1) of the following correctly describes the lineup of Fuel Building Ventilation after receipt of the annunciators listed above?

- A. Supply air is drawn into the Fuel Building via normal supply fans HVF-FN1A/1B and is exhausted from the Fuel Building via charcoal filter trains HVF-FLT2A AND HVF-FLT2B.
- B. Supply air is drawn into the Fuel Building via the Fuel Receiving Area and is exhausted from the Fuel Building via charcoal filter trains HVF-FLT2A AND HVF-FLT2B.
- C. Supply air is drawn into the Fuel Building via the normal supply fans HVF-FN1A/1B and is exhausted from the Fuel Building via charcoal filter train HVF-FLT2A ONLY.
- D. Fuel Building is completely isolated

**ANSWER:    B**

**IDNO:**            677

NRC KA:	RO:	SRO:
295023 EA1.01	3.3	3.5

**LP #        HLO-048                    OBJ #        5**

**REFERENCES**    AOP-0027                    LOTM 60  
                      SOP-0062  
                      FHO-0001



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**QUESTION 65**

The plant is operating at 100% of rated power with the following conditions:

- A half scram is in on the "B" RPS trip system due to MSIV closure testing

The power supply for LS N683C (Level 8 RPS) fails.

Which one of the following correctly describes the response of the Reactor Protection System and the reason for the response.

- A. The plant will scram due to deenergization of the Level 8 trip unit (N683C), since the deenergization of the trip unit generates a half scram signal on RPS "A"
- B. The plant will remain operating with a half scram on "B" RPS since failure of the power supply for N683C forced it downscale precluding the possibility of receiving a Level 8 signal.
- C. The plant will scram when the trip unit N683C deenergizes and fails upscale generating a level 8 signal on RPS "A"
- D. The plant will remain operating with a half scram on RPS "B" since the trip unit N683C provides an input to RPS "B".

**ANSWER: A**

**IDNO: 678**

NRC KA:	RO:	SRO:
216000 K2.01		2.8

**LP #**

**OBJ #**

**REFERENCES**

**LOTM 3**

**REFERENCES**      AOP-0014 Att. 2

NRC KA:	RO:	SRO:
262002 A3.01	2.8	3.1

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**QUESTION 68**

The plant is in the process of starting up per GOP-0001 with the following plant conditions.

- Reactor Power is 7%
- Main Turbine is Off line
- Reactor pressure is 920 psig being controlled by the Bypass Valves
- CCP P1B is tagged out for pump maintenance
- CCS P1A is tagged out for motor bearing replacement

A loss of NPS-SWG1A occurs.

Which one of the following correctly describes the actions to be taken?

- A. Attempt to start at least one CCS Pump, if flow cannot be re-established manually scram the reactor.
- B. Halt the plant startup until power can be restored to NPS-SWG-1A.
- C. Manually scram the reactor and trip/isolate both Recirc Pumps
- D. Manually scram the reactor and initiate Standby Service Water.

**ANSWER: C**

**IDNO: 681**

NRC KA:	RO:	SRO:
400000 K2.01	2.9	3

**LP # OBJ #**

**REFERENCES SOP-0011**

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**QUESTION 69**

The plant is operating at 100% rated power. HPCS is being run from CST to CST for quarterly surveillance testing.

An I&C technician in the field inadvertently isolates instrument air to instrument rack JTB-RAK17 which provides instrument air to the following valves:

- 1CNS-LV103 (Hotwell Level Makeup Valve)
- 1CNS-LV104 (Hotwell Emergency Makeup Valve)
- 1CNS-LV105 (Hotwell Drawoff Valve)

Assuming NO operator action, which one of the following correctly describes the system and plant response to this action?

- A. 1CNS-LV104 and 1CNS-LV103 fail closed, 1CNS-LV105 fails open. Hotwell Level will fall causing the HPCS suction to swap to the Suppression Pool on low Hotwell Level and the Condensate Pumps to eventually trip due a loss of suction.
- B. 1CNS-LV104 and 1CNS-LV105 fail closed, 1CNS-LV103 fails open. CST Level will fall causing the HPCS suction to swap to the Suppression Pool on low CST level. Main Condenser vacuum will fall due to rising level in the Hotwell.
- C. 1CNS-LV103, 1CNS-LV104 and 1CNS-LV105 will fail closed. CST Level will remain constant and HPCS will remain in operation CST to CST.
- D. 1CNS-LV103, 1CNS-LV104 and 1CNS-LV105 fail open. CST Level will rise causing the HPCS suction to swap to the Suppression Pool on High CST level.

**ANSWER: B.**

**IDNO:** 682

NRC KA:	RO:	SRO:
256000 A4.03	3.2	3.1

**LP #** **OBJ #**

**REFERENCES** SOP-0008 LOTM 32  
AOP-0008

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**QUESTION 70**

The plant is operating in mode 1 at 100% of rated power. STP-053-3001 (Jet Pump Operability) has just been completed. Upon review of the STP the CRS has discovered that Jet Pump # 7 is inoperable.

The CRS enters T.S. 3.4.3 Action A, requiring the plant to be in Hot Shutdown within 12 hours.

Which one of the following correctly describes the basis behind this required tech spec action?

- A. A failed jet pump increases the probability of instability events at lower power levels during low flow conditions.
- B. With a failed jet pump, neutron flux distribution across the core changes due to the change in core flow, thereby making the APRM indications unreliable.
- C. A failed jet pump increases the blowdown area and reduces the capability of reflooding to two thirds (2/3) core height following a LOCA.
- D. A failed jet pump causes the APRM Flow Biased scram and rod block setpoints to drift due to the increase or decrease in flow in the affected loop.

**ANSWER: C.**

**IDNO: 683**

NRC KA:	RO:	SRO:
290002 A2.01	3.7	4

**LP #**

**OBJ #**

**REFERENCES T.S. 3.4.3 Bases**

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**QUESTION 71**

The plant is operating in Mode 1 with the following conditions existing:

- Reactor Power is 100% of rated
- Core Flow is 90.3% of rated
- RPV Water Level is + 36 inches

The ATC prints out a copy of the "Daily Core Performance Log" for the previous days shift (attached).

Based upon the information contained in the periodic performance log, which one of the following correctly describes the action(s) to be taken?

- A. Restore MCPR to within the limits within two (2) hours.
- B. No action is required, all thermal limits are within the limits specified within Technical Specifications.
- C. Restore MCPR to within the limits within two (2) hours and insert all insertable control rods.
- D. Reduce power to less than 25% of rated within four (4) hours.

**ANSWER: A**

**IDNO: 684**

NRC KA:	RO:	SRO:
2.1.19	3	3

**LP #**

**OBJ #**

**REFERENCES** T.S. 2.1  
T.S. 2.2  
T.S. 3.2.2  
COLR Figures 16/17

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**QUESTION 72**

The National Oceanic and Atmospheric Administration (NOAA)/National Weather Service (NWS) has contacted the Main Control Room at River Bend Stationl

The NOAA has issued a Hurricane Warning affecting West Feliciana Parish in approximately 20 hours.

Which one of the following identifies a duty that a SNEO assigned to the shift would be expected to perform within the next eight (6) hours?

- A. Review AOP-0004 (Loss of Offsite Power) and AOP-0050 (Station Blackout)
- B. Assist in relocating the Main Generator Hydrogen trailer to an offsite location.
- C. Tag out the elevators in all buildings within the protected area.
- D. No special actions are required until the threat of a hurricane is imminent (less than 4 hours)

**ANSWER: B.**

**IDNO:** 685

NRC KA:	RO:	SRO:
2.4.35	3.3	3.5

**LP #**                      **OBJ #**

**REFERENCES** AOP-0029



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**QUESTION 73**

Which one of the following maintains a negative pressure in the annulus following a LOCA?

- A. SBT system starts and takes a suction on the Annulus Pressure Control System.
- B. Annulus mixing fans start and discharge to the Annulus Pressure Control System.
- C. The SBT System starts and takes a suction from Annulus Mixing
- D. SBT system starts and takes a suction directly from the Annulus.

**ANSWER: C.**

**IDNO: 82**

NRC KA:	RO:	SRO:
290001 K1.04	3.7	3.9

**LP # HLO-038 OBJ # 2d**

**REFERENCES** SOP-0059 LEVEL 2  
SOP-0043

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**QUESTION    74**

During the implementation of the emergency plan, you have a need for a direct computer link with off site agencies.

Which of the following off site agencies DO NOT have a direct ESP\_COM computer link with River Bend Station?

- A. Nuclear Regulatory Commission.
- B. State of Louisiana.
- C. Parishes within the 10 mile EPZ.
- D. State of Mississippi.

**ANSWER:    A**

**IDNO:            185**

NRC KA:	RO:	SRO:
2.4.43	2.8	3.5

**LP #                                      OBJ #**

**REFERENCES**

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SENIOR REACTOR OPERATOR**

**QUESTION     75**

WHICH ONE (1) of the following sets of conditions would result in the Automatic Depressurization System (ADS) safety relief valves opening? Assume all ECCS pumps designated as running generate from 150 to 160 psig discharge pressure.

	Reactor Level/Minutes at this level	Drywell Pressure	ECCS pumps Running
A.	-135/6	2.1	RHR A, LPCS
B.	-140/5.75	1.5	RHR B, LPCS
C.	-130/5	2.1	RHR B, RHR C
D.	-145/3.75	1.8	RHR A, LPCS

**ANSWER:     D**

**IDNO:**            342

NRC KA:	RO:	SRO:
218000 K5.01	3.8	3.8
295024 EK2.08	4	4.1

**LP #**

**OBJ #**

**REFERENCES**

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 76**

EOP 3, Secondary Containment and Radioactivity Release Control, must be entered if the Secondary Containment differential pressure is above the maximum normal operating differential pressure.

Which one of the following is the reason for this entry condition?

- A. A significant steam leak into the secondary containment is indicated.
- B. A significant water leak from primary system may be discharging radioactivity directly to the secondary containment.
- C. A potential for the loss of secondary containment is indicated that could result in uncontrolled radioactive releases.
- D. An increase in the unmonitored ground level radioactive releases due to leakage through secondary containment is indicated.

**ANSWER: C.**

**IDNO:** 377

NRC KA:	RO:	SRO:
295035 EK1.01	3.9	4.2
295035 EA2.02	2.8	4.1

**LP #** HLO-515      **OBJ #** 5

**REFERENCES** EPSTG\*0002

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 77**

Concerning the Containment Hydrogen Deflagration Overpressure Limit (HDOL). Which one of the following statements is true?

- A. As containment pressure increases, the maximum allowed hydrogen concentration decreases due to the decreased capabilities of the Hydrogen Recombiners with an increase in pressure.
- B. As containment pressure increases, the maximum allowed hydrogen concentration decreases because the deflagration pressure of hydrogen decreases.
- C. As containment pressure increases, the maximum allowed hydrogen concentration increases because it takes a higher concentration of hydrogen to burn at higher pressures.
- D. As containment pressure increases, the maximum allowed hydrogen concentration decreases to ensure that a hydrogen deflagration at the limit combined with current pressure will not exceed containment overpressure failure limits.

**ANSWER: D.**

**IDNO:** 674

NRC KA:	RO:	SRO:
500000 EK3.01	3.3	3.9

**LP #** HLO-513 **OBJ #**

**REFERENCES** EPSTG-0002, App. A  
EOP-1 Figure 5

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 78**

With the plant at 100% power, a loss of VBN-PNL01B1 has resulted in a loss of power to the Feedwater Level Control System giving a Feed Reg Valve control signal failure.

The power loss also caused both Reactor Recirc pumps to shift from fast speed to slow speed and the B Recirc Flow control valve to lockup. Which plant response would result from these failures? (Assume no operator actions.)

- A. The "B" Feed Reg Valve would fail closed and the "A" and "C" Feed Reg Valves would AUTO OPEN to compensate. Reactor power will stabilize at a lower power level with both Recirc pumps in slow speed.
- B. All 3 Feed Reg valves will fail open. RPV level will raise to 51" which will initiate a reactor scram, Turbine trip, and Feedwater pump trip.
- C. All 3 Feed Reg valves will fail closed. Reactor power will lower when Recirc pumps down shift and RPV level will lower to 9.7" which will initiate a reactor scram. HPCS and RCIC will initiate at Level 2 and restore RPV level .
- D. All 3 Feed Reg valves will fail "as is". Reactor power will lower when Recirc pumps down shift and RPV level will raise to 51" which will initiate reactor scram, Turbine trip, and Feedwater pump trip.

**ANSWER: D.**

**IDNO:** 421

NRC KA:	RO:	SRO:
259002 K6.02	3.3	3.4
263000 K3.03	3.4	3.8
259002 K4.13	3.5	3.6

**LP #** HLO-532      **OBJ #** 7

**REFERENCES** AOP-0042      LEVEL 4  
ARP-680-3-A06

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SENIOR REACTOR OPERATOR**

**QUESTION    79**

The plant is operating at power and a fuel handling team is working in the Fuel Building, when an irradiated fuel bundle is dropped and is lying on the bottom of the spent fuel pool.

Which of the following actions should be taken?

- A. Evacuate the Fuel Building
- B. Start the second charcoal filter train of the Fuel Building HVAC.
- C. Manually scram the reactor.
- D. Direct the team to attempt to recover the bundle with the bridge grapple.

**ANSWER:    A**

**IDNO:**            431

NRC KA:	RO:	SRO:
2.2.32	3.5	3.3

**LP #        HLO-535                    OBJ #        4**

**REFERENCES    AOP-0027**

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION     80**

Which of the following would be an indication of a DECREASE in the efficiency of the Offgas system catalytic recombiners?

- A. Main Condenser vacuum will decrease.
- B. Offgas recombiner temperatures will increase.
- C. Offgas system total flow volume will increase.
- D. Offgas system discharge radiation levels due to Nitrogen-16 will decrease.

**ANSWER:     C.**

**IDNO:**            480

NRC KA:	RO:	SRO:
271000 A108	3.1	3.1
271000 K4.01	2.9	3.3

**LP #     HLO-047            OBJ #     11**

**REFERENCES**



**U.S. NUCLEAR REGULATORY COMMISSION  
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**QUESTION 81**

Given the following conditions:

- The Main Control Room has been evacuated due to a fire
- All AOP-0031 immediate operator actions are complete, however the shutdown status of the reactor could not be determined prior to evacuation
- Control of the plant has been established at the Remote Shutdown Panel
- RPV Water Level is +40 inches being maintained by HPCS and RCIC
- RPV Pressure is being maintained between 926 psig and 1064 psig with SRVs
- SRV B21-F051C is open
- SRV B21-F051G is being cycled to maintain pressure within the pressure band
- The reactor was scrammed 12 minutes ago

Which one of the following describes the correct action to be taken by the CRS?

- A. Carry out the actions of AOP-0031 (Shutdown From Outside the Main Control Room) ONLY.
- B. Enter EOP-0001A, RPV Control - ATWS and continue to carry out the actions of AOP-0031.
- C. Enter EOP-0001, RPV Control and continue to carry out the actions of AOP-0031.
- D. Enter EOP-0001, RPV Control and exit AOP-0031.

**ANSWER: B**

**IDNO: 675**

NRC KA:	RO:	SRO:
295016 AA1.08	4	4
295016 AA1.01	3.8	3.9

**LP # HLO-066 OBJ # 12**

**REFERENCES AOP-0031**

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 82**

Given the following conditions:

- The plant is in Mode 5
- The RPV Head is removed and refueling is in progress
- The water level in the refueling cavity is decreasing due to a leak

Which of the following describes the first indications that the Main Control Room will have of the leak?

- A. The level decrease in the cavity will be seen immediately on the Wide Range level indication (recorder and meter).
- B. The level decrease in the cavity will indicate on the Narrow Range (recorder and meter) as soon as level reaches the top of the main steam lines.
- C. The level decrease in the cavity will be seen immediately on the Upset Range level indication (recorder).
- D. The level decrease in the cavity will indicate on the Shutdown Range (meter) before level reaches the reactor vessel flange.

**ANSWER: D**

**IDNO:** 516

NRC KA:	RO:	SRO:
295009 AA.201	4.2	4.2

**LP #** HLO-056 **OBJ #** 06

**REFERENCES**

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 83**

The plant is operating at 100 % power.

The air supply fails to both Annulus Pressure Control Systems (APCS) isolation dampers, HVR-AOD23A/B, APCS FAN A/B SUCTION.

How will the plant/system respond?

- A. The APCS continues to maintain a negative pressure of 3.0 inches W.G.
- B. The Annulus Mixing and the Standby Gas Treatment System start automatically to maintain negative pressure of at least 0.5 inches W.G.
- C. The Standby Gas Treatment System must be started manually to maintain negative pressure of at least 0.5 inches W.G.
- D. The APCS continues to operate and the Standby Gas Treatment System start automatically to maintain a negative pressure of 3.0 inches W.G.

**ANSWER: B**

**IDNO:** 618

NRC KA:	RO:	SRO:
288000 A3.01	3.8	3.8

**LP #** HLO-038      **OBJ #** 5

**REFERENCES** ARP-P863-72A-C01      CFR 41.13  
CFR 41.4

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 84**

The plant is operating during an emergency. The shift determines that conditons are such that there is no appropriate action to be taken which would be in compliance with the station operating license.

Whose permission at a MINIMUM is required to take the required actions to maintain the plant in a safe condition and when must the NRC be notified of such actions?

- A. Control Room Supervisor; notify the NRC within one (1) hour.
- B. General Manager, Plant Operations; notify the NRC within thirty (30) days in a written report.
- C. Control Room Surpervisor; notify the NRC within four (4) hours.
- D. Operations Shift Superintendent; notify the NRC within thirty (30) days in a written report.

**ANSWER: A**

**IDNO: 649**

NRC KA:	RO:	SRO:
2.4.40		4

**LP # OBJ #**

**REFERENCES** 10CFR50.54 CFR 43.3  
RBNP-004 CFR43.5

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 85**

The plant is operating at 100% power.

Maintenance has been performed on the RCIC Turbine. Mechanical Maintenance has requested that RCIC be operated for an hour before any test data is taken to allow RCIC to fully heat up.

Which one of the following describes the requirements to allow prolonged operation of RCIC with regard to Suppression Pool operation.

- A. Monitor temperature and level of the Suppression Pool every 30 minutes and verify EOP entry conditions.
- B. Operate two loops of RHR Suppression Pool Cooling and monitor Suppression Pool Temperature every 15 minutes.
- C. Operate Suppression Pool Cleanup to ensure mixing of the Suppression Pool and monitor Suppression Pool Temperature every 5 minutes.
- D. Operate a loop of RHR Suppression Pool Cooling and monitor Suppression Pool Temperature every 5 minutes.

**ANSWER: D**

**IDNO:** 653

**LP #** **OBJ #**

**REFERENCES** T.S. 3.6.2.1 CFR 41.10  
SR 3.6.2.1.1 CFR 43.5  
SOP-0035

NRC KA:	RO:	SRO:
295013 AK3.01		3.8
2.1.11		3.8
2.4.21		4.3
2.4.4		4.3

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 86**

The plant is operating at 95% power starting up to 100% rated power. A failure of the air supply to the "A" Heater Drain Recirc controller results in a loss of feedwater heating and entry into AOP-0007.

The Reactor Engineer is contacted and runs a Thermal Limits Calculation and determines that MCPR is 1.12

Which one of the following describes the correct actions to be taken for this condition?

- A. No action is required.
- B. Restore MCPR to within the limits within one (1) hour and notify the plant manager within 24 hours.
- C. Restore MCPR to within the limits and insert all insertable control rods within two (2) hours
- D. Restore MCPR to within the limits within two (2) hours and continue the plant startup, otherwise be in Hot Shutdown within six (6) hours.

**ANSWER: C.**

**IDNO: 676**

NRC KA:	RO:	SRO:
2.2.22	3.4	4.1

**LP #**

**OBJ #**

**REFERENCES** T.S. 2.1.1.2  
T.S. 2.2.2

CFR 41.10  
CFR 43.2

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 87**

The plant has experienced an ATWS condition.

The following parameters exist at the present time:

Reactor Mode Switch is in Shutdown

Reactor Pressure is 700 psig

Reactor Water Level is - 110 inches

Reactor Power is < 1 %

Suppression Pool Temperature is 20 degrees fahrenheit

MSIVs are closed.

IRMs and SRMs are inserted.

Under which one of the following conditions would it be appropriate to exit EOP-1A – RPV Control - ATWS?

- A. Standby Liquid Control has injected Hot Shutdown Boron Weight into the reactor
- B. The Reactor Engineer has performed shutdown margin determinations and has determined that adequate shutdown margin exists for all conditions.
- C. Standby Liquid Control has injected Cold Shutdown Boron Weight into the reactor with an additional 25 % injected to allow for imperfect mixing and leakage.
- D. Chemistry and the STA have determined that the combination of Boron and Control Rods has brought the reactor subcritical for all conditions.

**ANSWER: B**

**IDNO:** 686

NRC KA:	RO:	SRO:
295006 K1.02		3.7

**LP #**                      **OBJ #**

**REFERENCES** EPSTG-0002  
EOP-0001A

## REFERENCES



**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 89**

While conducting refueling operations, the following has occurred:

- A fuel bundle was dropped during withdrawal from the core.
- The bundle is resting about 30 degrees off vertical
- Bubbles are observed rising from the fuel bundle.
- RMS-RE5A is in ALERT reading 4.23 E-3 microcuries/ml

Which one of the following identifies the correct actions to be taken?

- A. Stop all refueling operations, declare an ALERT per the Emergency Plan and enter EOP-0003.
- B. Retrieve the bundle and place it in the nearest safe position and declare a NOUE per the Emergency Plan
- C. Stop all refueling operations, declare a SAE (Site Area Emergency) and enter EOP-0003
- D. Retrieve the bundle, place it in a safe location. No further actions are required until Reactor Engineering gives permission to resume refueling operations.

**ANSWER: A.**

**IDNO: 688**

NRC KA:	RO:	SRO:
295023 A2.05		4.6

**LP # OBJ #**

**REFERENCES** EIP-2-001  
EOP-0003

**U.S. NUCLEAR REGULATORY COMMISSION  
WRITTEN EXAMINATION OCTOBER 2000  
SENIOR REACTOR OPERATOR**

**QUESTION 90**

Which one of the following describes why Emergency Depressurization is directed when Primary Containment temperature cannot be maintained below 185 degrees fahrenheit?

- A. To prevent exceeding the Suppression Pool Boundary design load if SRVs are opened.
- B. To reduce as much as possible continued temperature increase and thereby maintain equipment operability as long as possible.
- C. To prevent formation of steam from the Suppression Pool and therefore the direct pressurization of the Containment.
- D. 185 degrees fahrenheit corresponds to the saturation pressure above which the Containment Pressure Limit would be exceeded.

**ANSWER: B.**

**IDNO: 690**

NRC KA:	RO:	SRO:
295011 K1.01		4.1

**LP #**

**OBJ #**

**REFERENCES EPSTG-0002**

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 91**

Given the following conditions:

The plant had been operating at 100% power

- SRV B21-F051D comes open.

Which of the following describes an immediate operator action required by this condition?

- A. Place the SRV hand switch for B21-F051D in the OFF position.
- B. Initiate Suppression Pool Cooling per SOP-0031, Residual Heat Removal
- C. Declare a NOUE, per EIP-2-001, Classification of Emergencies
- D. Place the SRV hand switch for B21-F051D in the OPEN position.

**ANSWER: D.**

**IDNO:** 691

NRC KA:	RO:	SRO:
239002 A2.03		4.2

**LP #** HLO-007      **OBJ #** 3

**REFERENCES** AOP-0035

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 92**

A loss of condenser vacuum has occurred, vacuum is currently 9.5" Hg. Which of the following automatic actions should have occurred?

- A. Turbine trip, bypass valve closure and MSIV isolation.
- B. Turbine trip and bypass valve closure.
- C. Turbine trip only.
- D. Turbine trip and MSIV isolation.

**ANSWER: C.**

**IDNO:** 692

NRC KA:	RO:	SRO:
241000 K5.05		3.4

**LP #** HLO-524      **OBJ #** 01

**REFERENCES** AOP-0005  
AOP-0002

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 93**

The UO is at P877 preparing to parallel the Division I EDG with its respective bus and load to support the monthly run. You note the following indications:

- V1IN-1SYDA01 (Incoming Voltage): 120 VAC
- V1RUN-1SYDA01 (Running Voltage): 120 VAC
- SY-1-1SYDA01 (Stby Bus A Synchroscope): Rotating slowly in the SLOW direction

Which one of the following describes the required actions to be taken by the UO to ensure that the two AC sources are paralleled without incident?

- A. Raise EDG output voltage to ensure that the EDG output (Incoming Voltage) is slightly higher than bus voltage (Running Voltage).
- B. Lower EDG output voltage to ensure that the EDG output voltage (Incoming Voltage) is slightly lower than bus voltage (Running Voltage)
- C. Raise EDG speed (frequency) to ensure that the synchroscope (Stby Bus A Synchroscope) is rotating slowly in the FAST direction.
- D. No further adjustments are necessary prior to closing the EDG output breaker.

**ANSWER: C.**

**IDNO:** 693

NRC KA:	RO:	SRO:
262001 K5.01		3.4

**LP #** **OBJ #**

**REFERENCES** SOP-0053

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 94**

The plant is operating a 90% with a power ascension to 100% in progress.

- Offgas Post Treat Radiation Monitor "B" is failed upscale, I&C is troubleshooting

Offgas Post Treat Radiation Monitor "A" fails downscale.

Which one of the following describes the correct action for the CRS to direct next.

- A. No action is required if Offgas Pre Treat Radiation Monitors "A" and "B" are in service.
- B. Contact Radiation Protection to sample the Offgas Post Treat radiation level once every four (4) hours.
- C. Enter AOP-0005, for loss of main condenser vacuum
- D. Reduce power to less than 5% within six (6) hours, place at least one mechanical vacuum pump in service and remove the SJAE from service.

**ANSWER: C.**

**IDNO:** 694

NRC KA:	RO:	SRO:
272000 K3.05		3.7

**LP #**

**OBJ #**

**REFERENCES** AOP-0005

LOTM 66



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SENIOR REACTOR OPERATOR**

**QUESTION 96**

The HPCS system is running taking a suction from the CST and returning to the CST. A Suppression Pool high level occurs. Which one of the following describes the flow path of the HPCS system?

- A. HPCS pump suction from the CST, discharge to the suppression pool through the min flow line.
- B. HPCS pump suction from the CST, discharge to the CST through the test return line.
- C. HPCS pump suction from the suppression pool, discharge to the suppression pool through the min flow line.
- D. HPCS pump suction from the suppression pool, discharge to the CST through the test return line

**ANSWER: C**

**IDNO:** 696

NRC KA:	RO:	SRO:
2.1.31		3.9

**LP #** HLO-019 **OBJ #** 9

**REFERENCES** SOP-0030 CFR 41.4



**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 97**

Which one of the conditions listed below requires entry into EOP-0003 for Secondary Containment and Radioactive Release Control?

- A. Offgas Pre treatment Radiation Monitor reading greater than 5 E5 cpm.
- B. Main Steam Line Radiation Monitor reading greater than 1.5 times normal full power background readings.
- C. Radwaste Building Ventilation Exhaust Monitor RMS-RE6A (Channel No. 2006) reading 6.5 E-4 microcuries/ml.
- D. Fuel Receiving Area High Radiation Alarm.

**ANSWER: C**

**IDNO:** 697

NRC KA:	RO:	SRO:
2.3.11		3.2

**LP #**

**OBJ #**

**REFERENCES** EOP-0003  
EIP-2-001

CFR 41.10  
CFR 43.5

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 99**

The following are current plant conditions:

The plant has experienced a Loss of Coolant Accident concurrent with an ATWS.  
Two personnel are unaccounted for in the Auxiliary Building.

The Emergency Director has directed the Search and Rescue Team to enter the building and the following information is available:

- Both team members are volunteers and have no current quarterly exposure.
- Emergency Exposure Limits have NOT been authorized.
- All persons have NRC form 4 on file.

What is the MAXIMUM TEDE, according to 10 CFR 20, each member of the Search and Rescue Team is allowed to receive on this entry?

- a. 75 rem
- b. 25 rem
- c. 50 rem
- d. 5 rem

**ANSWER: D**

**IDNO:** 699

NRC KA:	RO:	SRO:
2.4.12		3.9

**LP #**

**OBJ #**

**REFERENCES** 10CFR20.1201

CFR 43.2

**U.S. NUCLEAR REGULATORY COMMISSION  
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SENIOR REACTOR OPERATOR**

**QUESTION 100**

The following conditions exist:

- The plant has experienced a fuel leak as indicated by Offgas radiation level and chemistry samples
- MSIV handswitches were taken to CLOSE.
- Neither MSIV in the "A" line closed, all others closed.
- B21\* MOVF098A breaker tripped while attempting to close the valve.
- The reactor is shutdown, all control rods are fully inserted
- RPV level dropped to +5 inches on narrow range and recovering.
- Reactor pressure is 900 psig and slowly lowering.
- There is an unisolatable steam leak in the turbine building outside the steam tunnel.
- Various turbine building area radiation monitors indicate increasing levels.
- A GENERAL EMERGENCY has been declared based EAL 2.5.

Based upon the conditions given, which of the following EOPs must be entered?

- A. Only EOP 1 RPV Control.
- B. EOP 1 RPV Control and EOP 2 Primary Containment Control.
- C. EOP 1 RPV Control and EOP 3 Secondary Containment and Radioactive Release Control.
- D. EOP 2 Primary Containment Control and EOP 3 Secondary Containment and Radioactive Release Control.

**ANSWER: A**

**IDNO: 183**

NRC KA:	RO:	SRO:
2.4.1	4.3	4.6
2.4.48		3.8

**LP # OBJ #**

**REFERENCES** EOP-0001 CFR 41.10  
EOP-0002 CFR 43.5  
EOP-0003