

**U.S. NUCLEAR REGULATORY COMMISSION
WRITTEN EXAMINATION OCTOBER 2000
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

LP # HLO-511 OBJ # 6

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

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Control Rods are being withdrawn for power ascension.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 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

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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 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

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

REFERENCES EOP-0001 LEVEL 3
Caution 1

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

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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

LP # HLO-512 OBJ # 5

REFERENCES EPSTG*0002 LEVEL 3

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

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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 20

A startup of the Main Turbine is being performed. The Main Turbine is at 60 percent of rated speed, when a loss of 125 VDC Trip Circuit Power is experienced. WHICH ONE (1) of the following describes the required operator action(s)?

- a. Enter AOP-0002, Main Turbine and Generator Trips, due to trip of the Turbine.
- b. Verify that 24 VDC ETS power is available and continue the startup of the Main Turbine IAW SOP-0080, otherwise manually trip the Main Turbine.
- c. Allow the Main Turbine to accelerate to greater than 90 percent of rated speed, at which time the 125 VDC Trip Circuit is no longer required because the PMG is supplying the trip circuitry.
- d. The start-up of the Main Turbine may continue, but at least one 125 VDC bus must be restored prior to synchronizing the generator to the grid.

ANSWER: A.

IDNO: 356

NRC KA:	RO:	SRO:
245000 K6.06	3	3.2
245000 A2.01	3.7	3.9

LP # STM-110 **OBJ #** 26

REFERENCES AOP-0002 LEVEL 3

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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.

IDNO: 412

NRC KA:	RO:	SRO:
2.2.12	3	4

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

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

REFERENCES AOP-0024 LEVEL 3

NRC KA:	RO:	SRO:
202002 A2.01	3.4	3.4
295001 AK2.02	3.2	3.3
295001 AK3.06	2.9	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 5.5×10^4 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 1.0×10^5 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 1.0×10^5 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 1.0×10^5 cps and then will not be allowed until associated IRM power is at or above Range 8.

ANSWER: D.

IDNO: 666

LP # STM-503 **OBJ #**

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

REFERENCES

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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 fahrenheit
- 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

LP # HLO-016 OBJ # 6

REFERENCES EOP-0005, Encl. 15

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

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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

LP # STM-503 **OBJ #**

REFERENCES

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

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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

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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
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
WRITTEN EXAMINATION OCTOBER 2000
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
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
WRITTEN EXAMINATION OCTOBER 2000
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

LP # HLO-514 **OBJ #** 05

REFERENCES EOP-0002
EPSTG-0002

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

**U.S. NUCLEAR REGULATORY COMMISSION
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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
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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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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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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

LP # HLO-515 **OBJ #** 4

REFERENCES EOP-0003
EOP-001A

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

**U.S. NUCLEAR REGULATORY COMMISSION
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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
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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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

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

REFERENCES SOP-0074
 REP-0037
 TS 3.3.1.1.2
 CFR 41.6

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

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
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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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REACTOR OPERATOR**

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

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

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

LP #

OBJ #

REFERENCES USAR 15.2.4.1.2.2

CFR 41.5
CFR 41.14

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

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

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

**U.S. NUCLEAR REGULATORY COMMISSION
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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

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

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

LP # OBJ #

REFERENCES EOP-2, H2 Control CFR 41.10
CFR 43.5

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

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

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

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

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

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

QUESTION 73

Given the following plant conditions:

- The Refuel Platform is over the core.
- The Mode Switch is in REFUEL.

Which of the following will cause a control rod block?

- A. Withdraw a control rod.
- B. Loading the Auxiliary Platform hoist.
- C. Loading the Refuel Platform main hoist.
- D. Loading the Refuel Platform monorail hoist.

ANSWER: C

IDNO: 4

LP # HLO-022 OBJ # 2

REFERENCES FHP-0003 LEVEL 3

NRC KA:	RO:	SRO:
234000 K4.01	3.3	4.1

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

QUESTION 74

Following a Loss of Coolant Accident the following plant parameters exist:

- Reactor pressure is 450 psig
- Vessel level is -95 inches
- Drywell pressure is 1.8 psid
- Containment pressure is normal and steady.

Which one of the following describes the Low Pressure Coolant Injection mode of the Residual Heat Removal system?

- A. Pumps have started, but are not injecting because the injection valves, F042A, B, and C have not opened.
- B. Pumps have started, injection valves F042A, B, and C have opened, but reactor pressure is too high for injection.
- C. Pumps have not started, but injection valves F042A, B and C have opened.
- D. Pumps have started, injection valves F042A, B, and C have opened, and injection has started.

ANSWER: B.

IDNO: 145

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

NRC KA:	RO:	SRO:
203000 A1.01	4.2	4.3
203000 K1.17	4	4
203000 A1.02	3.9	4
203000 K4.01	4.2	4.2

REFERENCES SOP-0031

LEVEL 2

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

QUESTION 75

The plant has experienced a transient requiring a scram with a failure of the scram functions to work (ATWS). Plant conditions are as follows:

- Reactor Power is 4%
- Suppression Pool temperature is 110 degrees fahrenheit
- A loss of ENS-SWG 1A has occurred with a failure of the Division I EDG to start
- A loss of instrument bus SCM-PNL01B has occurred
- Pressure control is being maintained with the Turbine Bypass Valves between 920 - 1060 psig
- All SRVs are closed

Considering the above conditions, which one of the following statements is correct.

- A. Boron injection is required and can be accomplished by starting and injecting with SLC Pump B.
- B. Boron injection is not required because reactor power is less than 5%
- C. Boron injection is required but must be accomplished via alternate methods due a loss of SLC Pump "A" and SLC "B" Squib Valve.
- D. Boron injection is not required because Suppression Pool temperature is not above 110 degrees fahrenheit.

ANSWER: A

IDNO: 672

LP # HLO-016 OBJ # 6

REFERENCES EOP-0001A

NRC KA:	RO:	SRO:
211000 A4.02	4.2	4.2

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REACTOR OPERATOR**

QUESTION 76

The Instrument Air System to the primary containment has been isolated by closing IAS-MOV106.

The plant is 2 days into a 7 day LCO (3.6.1.8 B) due to both divisions of PVLCS being inoperable.

Assuming all other air systems are in service. How does this affect the ADS valves?

- A. No effect since the ADS valves are supplied with operating air from the Service Air System
- B. The valves can only be cycled 2½ times.
- C. No effect since the ADS valves are supplied with operating air from the SVV air compressors.
- D. The valves will not operate due a loss of operating air from PVLCS and IAS.

ANSWER: C.

IDNO: 250

NRC KA:	RO:	SRO:
218000 A2.03	3.4	3.6
218000 K1.06	3.9	3.9

LP # HLO-064 OBJ # 5

REFERENCES

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

QUESTION 77

An MSIV closure resulted in a reactor scram. The pressure transient caused a small steam leak in the drywell. The following conditions exist:

- Reactor pressure is at 900 psig.
- Reactor Level is at -150 inches wide range
- Drywell pressure is 2.1 psid
- Containment pressure is 0.3 psig
- Lowest recorded ENS*SWG1A/1B Bus voltage was 3952 volts.

Which one of the following would be in service as indicated?
(NO OPERATOR ACTION TAKEN)

- A. DIV I D/G running supplying their respective buses.
- B. DIV II Stby. Service Water with flow through the "B" Containment Unit Cooler.
- C. Drywell units coolers running with no cooling flow.
- D. RHR "A" injecting to the RPV.

ANSWER: B

IDNO: 261

NRC KA:	RO:	SRO:
262001 K1.01	3.8	4.3
262001 A2.02	3.6	3.9

LP # HLO-037 **OBJ #** 4

REFERENCES SOP-0053 LEVEL 4
ARP-877-32-H03

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

QUESTION 78

A plant startup is in progress. Reactor power is being held at 1% power for the 900 psig Drywell walkdown. The following conditions exist:

- RPV water level is +36 inches on the narrow range
- Master Feedwater Level Controller Tape Set is +36 inches
- Startup Feedwater Level Controller Tape Set is +36 inches

The Startup Feedwater Reg. Valve drifts fully open.

Which of the following actions/signals will occur as a result of this failure?

(NOTE: Assume no operator action.)

- A. Reactor scrams on Level 8.
- B. Reactor feedwater pumps trip on high reactor level.
- C. Reactor water level remains unchanged due to compensation by the Long Cycle Cleanup Level Controller (CNM-104).
- D. Reactor water level stabilizes +42 inches on the narrow range

ANSWER: B

IDNO: 348

LP # STM-107 **OBJ #** 10

REFERENCES AOP-0006 LEVEL 3
SOP-0009

NRC KA:	RO:	SRO:
259002 K3.02	3.7	3.7
259002 K3.01	3.8	3.8
259002 A4.11	3.5	3.8

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

QUESTION 79

A loss of power has just occurred to one of the solenoids for an Main Steam Isolation Valve (MSIV).

Which of the following describes the response of the MSIV and the reason for that response?

The MSIV will:

- A. close because the solenoids energize to align the air supply to open the MSIV.
- B. remain open because the other solenoid continues to supply air to the MSIV.
- C. close because the solenoids are in series and either one deenergizing will vent the air supply to the MSIV.
- D. remain open because the instrument air accumulator for that MSIV continues to supply air to the actuator.

ANSWER: B

IDNO: 494

NRC KA:	RO:	SRO:
239001 K2.01	3.2	3.3
239001 K5.06	2.8	2.9

LP # HLO-007 **OBJ #** 03

REFERENCES

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

QUESTION 80

Given the following conditions:

- Drywell temperature and pressure are increasing due to a leak
- Drywell pressure is 1.82 psig
- Suppression Pool temperature is 101 degrees fahrenheit
- All expected automatic actions have occurred
- EOP-2, "Primary Containment Control", was entered for high drywell temperature and high Suppression Pool temperature.
- Enclosure 20 for restoration of drywell cooling is in progress
- RHR "A" and RHR "B" are in suppression pool cooling

Once the interlocks have been defeated, which of the following will be providing cooling to the drywell?

- A. Drywell cooler fans and normal service water.
- B. Drywell cooler fans and chilled water.
- C. Drywell cooler fans and standby service water.
- D. Drywell cooler fans ONLY.

ANSWER: C.

IDNO: 531

NRC KA:	RO:	SRO:
295012 K2.02	3.6	3.7
295012 K1.01	3.3	3.5

LP # HLO-038 **OBJ #** 05

REFERENCES EOP-0002, Encl. 20
SOP-0031

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

QUESTION 81

The plant was operating at 100 % power, when a Main Turbine trip caused a reactor scram and lift of two (2) Safety Relief Valve. Reactor level increased to +56 inches on narrow range. Plant conditions are as follows:

- Reactor is shutdown with all rods in
- RPV water level is +5 inches on the narrow range indication
- RFP "C" is running controlling RPV water level

Which one of the following describes the final status of the Reactor Recirculation System?

- A. Both Recirculation Pumps are in slow speed operation with the Recirc Flow Control Valves for both loops at minimum position.
- B. Both Recirculation Pumps are in slow speed operation with the Recirc Flow Control Valves remaining at the pre-transient positions.
- C. Both Recirculation Pumps are OFF with the Recirc Flow Control Valves for both loops in the minimum position.
- D. Both Recirculation Pumps are OFF with the Recirc Flow Control Valves remaining at the pre-transient positions.

ANSWER: A

IDNO: 541

NRC KA:	RO:	SRO:
202001 K4.16	3.3	3.6
259002 K1.15	3.2	3.2

LP # STM-053 OBJ # 2B

REFERENCES AOP-0024
ARP-P601-19A-H8
ARP-P601-19A-H11
CFR 41.5
CFR 41.6
CFR 43.6

**U.S. NUCLEAR REGULATORY COMMISSION
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QUESTION 82

The plant is operating at 100 % power. The CCP line inside Containment going to the RWCU Non-Regenerative Heat Exchangers has ruptured. An operator in the area has manually isolated CCP to the Non-Regenerative Heat Exchangers.

Which one of the following describes the plant response with NO further operator actions?

- A. The RWCU Filter Demins will isolate and go into hold due to Low CCP Flow through the Non-Regenerative Heat Exchangers.
- B. The RWCU Filter Demins bypass valve will open and the Filter Demins will go into Hold due to High Filter Demin Inlet temperature.
- C. The RWCU pumps will immediately trip on High Filter Demin Inlet Temperature and G33*MOV F004, RWCU PUMPS OUTBD SUCTION VALVE will isolate to protect the Filter Demins.
- D. G33*MOV F004, RWCU PUMPS OUTBD SUCTION VALVE will isolate on High Filter Demin Inlet temperature causing the RWCU pumps to trip on low flow.

ANSWER: D

IDNO: 579

NRC KA:	RO:	SRO:
204000 K4.04	3.5	3.6
204000 A3.03	3.6	3.6

LP # HLO-006 OBJ #

REFERENCES ARP-P608-01A-B01
ARP-P608-01A-A01
CFR 41.4
SOP-0009
AOP-0011

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

QUESTION 83

The plant is operating at 100 % power.

A leak in the RWCU pump room caused an isolation of the RWCU System.

G33*MOV F040, RWCU RETURN TO FW failed to close.

Which one of the following actions is **REQUIRED** to be taken?
(Tech Specs attached, if needed.)

- A. The penetration is allowed to remain unisolated if the remainder of isolation valves in the rest of the RWCU system have isolated.
- B. Verify another valve in the associated penetration is closed and is also de-activated.
- C. The penetration is allowed to be unisolated during present conditions as long as the RWCU pumps have tripped.
- D. The plant must shutdown to cold shutdown and shutdown the RWCU system.

ANSWER: B

IDNO: 598

NRC KA:	RO:	SRO:
290001 A2.06	3.7	4
290001 A4.10	3.4	3.3

LP # **OBJ #**

REFERENCES TS 3.6.1.3
TR 3.6.1.3-1
CFR 41.9

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

QUESTION 85

The plant is operating at 100 % power.

A fire erupts in the Division I Diesel Generator room causing the sprinkler system to initiate.

Fire Water header pressure has dropped to 115 psig.

Which one of the following actions would be expected to occur?

- A. The Motor Driven Fire Pump will auto start and the Diesel Driven Fire Pump “A” and “B” will start immediately if the Motor Driven Fire Pump fails to start.
- B. The Motor Driven Fire Pump will auto start, if header pressure is still at 115 psig after 15 seconds AND the Motor Driven Fire Pump failed to start, then the Diesel Driven Fire Pump “A” will start.
- C. The Diesel Driven Fire Pump “A” will auto start, if fire water header pressure remains at 115 psig for 10 seconds, whether the Motor Driven Fire Pump starts or NOT.
- D. The Diesel Driven Fire Pump “A” will auto start, if fire water header pressure remains below 140 psig for 10 seconds and the Motor Driven Fire Pump is running.

ANSWER: D

IDNO: 610

NRC KA:	RO:	SRO:
286000 K4.03	3.3	3.4
286000 A4.05	3.3	3.3

LP #

OBJ #

REFERENCES SOP-0037
CFR 41.4

**U.S. NUCLEAR REGULATORY COMMISSION
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QUESTION 88

EOP-2 requires containment to be vented before containment pressure reaches 30 psig. Which one of the following describes the flow path for emergency venting of the containment?

- A. Hydrogen purge discharges through the Drywell/Containment purge system filter train #6 to the main stack.
- B. Drywell/Containment purge system takes a suction on containment and discharges through filter train #6 to the main stack.
- C. Drywell/Containment purge fan takes a suction on containment and discharges through the purge exhaust fans to the main stack.
- D. Hydrogen purge discharges to the annulus and the annulus mixing system is in operation discharging to SGTS.

ANSWER: D

IDNO: 118

NRC KA:	RO:	SRO:
295024 EA1.19	3.3	3.4
261000 A4.04	3.3	

LP # HLO-516 **OBJ #** 21

REFERENCES EOP-0002 CP-8 LEVEL 3
EOP-0005 ENCL 21

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

QUESTION 89

During power ascension the following plant conditions are noted to occur over a 3 minute period.

Reactor pressure decreased to 820 psig, now stable.
Reactor Water Level +32" and rising.
Reactor power decreased 5%, now stable at 55%
Generator output decreased to 550 Mwe from 600 Mwe.

Which of the following is required?

- A. Scram and shut the MSIVs.
- B. Shut the MSIVs only.
- C. Increase power with recirculation flow.
- D. Insert a manual scram only.

ANSWER: A.

IDNO: 232

NRC KA:	RO:	SRO:
223002 A2.09	3.6	3.7
216000 K4.04		3.7

LP # HLO-007 OBJ # 9

REFERENCES AOP-0003
 AOP-0001
 ADM-0022

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

QUESTION 92

Which one of the following fire extinguishing agents utilizes a "free radical process" in which the chemical reaction of fuel and oxygen is inhibited thus rapidly stopping the combustion process.

- A. Chemical Firefighting Foam
- B. Halon
- C. Carbon Dioxide
- D. Water

ANSWER: B.

IDNO: 702

NRC KA:	RO:	SRO:
286000 K5.02	2.6	

LP #

OBJ #

REFERENCES

LOTM 73

**U.S. NUCLEAR REGULATORY COMMISSION
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QUESTION 94

The plant is operating at 100% power. The Control Room Operator places the Outboard MSIV Positive Leakage Control System switch to OPERATE.

Which of the following will prevent the Outboard MSIV Positive Leakage Control System from initiating?

- A. The post LOCA 20 minute timer has not timed out.
- B. The required main steam line pressure and reactor pressure requirements have not been met.
- C. A LOCA signal on either high drywell pressure or low reactor water level is not present.
- D. All Main Steam Isolation Valves have not been fully closed.

ANSWER: B

IDNO: 190

LP # LOTM-8 **OBJ #** 4

REFERENCES ARP-601-17-G05
ARP-601-17-G06
SOP-0034

NRC KA:	RO:	SRO:
239001 K1.13	2.6	2.8
239003 K1.01	3.3	3.4
239003 K4.03	2.9	3.2

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

QUESTION 95

WHICH ONE (1) of the following is the consequence of operating the Division I EDG with a loss of control air pressure?

- A. All non emergency shutdown functions on the Diesel are inhibited. Emergency shutdown functions remain operable.
- B. All shutdown functions on the Diesel are inhibited.
- C. The Diesel engine will shutdown.
- D. The jacket cooling water temperature control valve will fail open.

ANSWER: C

IDNO: 360

NRC KA:	RO:	SRO:
2.1.28	3.2	3.6

LP #

OBJ #

REFERENCES SOP-0053

**U.S. NUCLEAR REGULATORY COMMISSION
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QUESTION 99

Following Classification of an Emergency Event, what are the time interval guidelines for making NOTIFICATIONS to State and Local Authorities of the emergency classification?

Notification must be made:

- A. immediately.
- B. within 15 minutes.
- C. within 4 hours
- D. within 1 hour

ANSWER: B.

IDNO: 441

NRC KA:	RO:	SRO:
294001A116	2.9	4.7
2.4.39	3.3	

LP # ETT-023 **OBJ #** 1

REFERENCES EIP-2-002

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

QUESTION 100

A manual scram from full power was initiated as a result of high drywell pressure due to a leak. All automatic functions and isolations occurred per design, except that not all the control rods inserted fully. Plant conditions are as follows:

- Reactor Power is 10%
- Suppression Pool temperature is 105 degrees and rising
- MSIVs are closed
- SLC Pump "B" is running and injecting (approximately 5 minutes)

As the operator monitors SLC parameters, SLC tank level indicates zero (0) inches.

Which one (1) of the following actions should be taken next?

- A. Start SLC Pump "A".
- B. Re-energize NHS-MCC102A to restore power to the SLC tank level indication.
- C. Initiate actions to inject alternate SLC per Encl. 15.
- D. Install Encl. 16 Bypassing CNTMT Instrument Air Isolation Interlocks

ANSWER: D

IDNO: 416

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

NRC KA:	RO:	SRO:
295037 EA1.04	4.5	4.5
295037EA2.03	4.3	4.4
211000 K5.06	3	3.2
2.4.48	3.5	

REFERENCES EOP-0005, Encl. 16