U. S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date: 11-24-15	Facility / Unit: Browns Ferry Units 1,2,3
Region: ☐ I ■ II ☐ III ☐ IV	Reactor Type: W ☐ CE ☐ BW ☐ GE ■
Start Time:	Finish Time:

Instructions

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

Applicant Certification

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

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

Q 1

Unit 2 is in mode 5 with Refueling in progress, with the following system alignments:

- 2B RHR pump is in shutdown cooling.
- Both 2A and 2B Reactor Recirc pumps are tagged out of service.
- 2A RPS is powered from its alternate source.

Subsequently:

- Reactor Water Level drops to 0 inches and then recovers to + 75 inches.
- The only action taken by the crew was to reset any actuation(s) that may have occurred.

NOTE: RHR Sys II LPCI Inboard Injection Valve, 2-FCV-74-67
RHR Sys II LPCI Outboard Injection Valve, 2-FCV-74-66
RHR Shutdown Cooling Suction Outboard Isolation Valve, 2-FCV-74-47
RHR Shutdown Cooling Suction Inboard Isolation Valve, 2-FCV-74-48

Which ONE of the following describes the **minimum** actions required, in accordance with 2-AOI-74-1, Loss of Shutdown Cooling, prior to restarting the 2B RHR pump to restore Shutdown cooling?

A. CLOSE the 2-FCV-74-67, OPEN the 2-FCV-74-66, then OPEN 2-FCV-74-47 and 2-FCV-74-48.

B. CLOSE the 2-FCV-74-66, OPEN the 2-FCV-74-67, then OPEN 2-FCV-74-47 and 2-FCV-74-48.

C. CLOSE the 2-FCV-74-67, OPEN 2-FCV-74-66, then OPEN 2-FCV-74-48 only.

D. CLOSE the 2-FCV-74-66, OPEN 2-FCV-74-67, then OPEN 2-FCV-74-47 only.

Q 2

Units 1, 2, and 3 are operating at 100% power.

Subsequently:

A loss of all off site power occurs.

The following conditions exist:

- The C Diesel Generator is supplying the C 4KV shutdown board.
- The 3EB Diesel Generator is supplying the 3EB 4KV shutdown board.
- All other Diesel Generators failed to start.

Assume No Operator Actions Have Been Taken

Which ONE of the following completes the statement below?

Unit(s) _____ is (are) in a station black out.

A. 1 only

B. 2 only

C. 1 and 3 only

D. 2 and 3 only

Q 3

Which ONE of the following completes the statements below concerning the 250 VDC Unit batteries and battery chargers?

The Class 1E Unit Batteries have the capacity to compensate for a __ (1) __ Station Blackout event during multi-unit operations without operator action.

In accordance with 1/2-AOI-57-1D, 480V Load Shed, if the load shed logic can **Not** be reset the 2A 250V Battery charger may be returned to service by placing the charger select switch in __ (2) __.

A. (1) 4 hour
   (2) OFF then back to ON

B. (1) 12 hour
   (2) OFF then back to ON

C. (1) 4 hour
   (2) EMERG

D. (1) 12 hour
   (2) EMERG

Q 4

Which ONE of the following completes the statement below?

In the event of a Main Turbine trip without bypass valves from full power, a Reactor Scram is initiated to anticipate the __ (1) __ AND to prevent exceeding the __ (2) __ safety limit.

A. (1) rapid reduction in Reactor water level
   (2) Reactor water level

B. (1) rapid reduction in Reactor water level
   (2) MCPR

C. (1) rapid increase in Reactor pressure
   (2) Reactor water level

D. (1) rapid increase in Reactor pressure
   (2) MCPR

Q 5

Unit 1 is operating at 100% power when the B RPS MG set output breaker trips open.

Which ONE of the following describes required actions to place 1B RPS on alternate power in accordance with 1-AOI-99-1, Loss of Power to One RPS Bus?

A. Verify Circuit Protector 1B1 and 1B2 are Reset,
   Place the RPS bus 1B normal/alt transfer switch to ALT in Battery Board Rm 1

B. Verify Circuit Protector 1B1 and 1B2 are Reset,
   Place the RPS bus 1B normal/alt transfer switch to ALT in Battery Board Rm 2

C. Verify Circuit Protector 1C1 and 1C2 are Reset,
   Place the RPS bus 1B normal/alt transfer switch to ALT in Battery Board Rm 1

D. Verify Circuit Protector 1C1 and 1C2 are Reset,
   Place the RPS bus 1B normal/alt transfer switch to ALT in Battery Board Rm 2

Q 6

The Shift Manager has directed entering 3-AOI-100-2, Control Room Abandonment, due to heavy smoke in the U3 MCR.

Which ONE of the following completes the statements below?

The manual reactor SCRAM performed during 3-AOI-100-2 __ (1) __based on allowing time for operators to prepare for a plant cooldown.

If the Reactor fails to scram, 3-AOI-100-2 will direct __ (2) __.

A. (1) is
   (2) initiating ARI

B. (1) is
   (2) pulling RPS Scram Solenoid Fuses

C. (1) is NOT
   (2) initiating ARI

D. (1) is NOT
   (2) pulling RPS Scram Solenoid Fuses

Q 7

Unit 1 is operating at 100% power.

An RBCCW leak develops causing the 1-FCV-70-48, RBCCW Sectionalizing valve, to close, isolating the leak.

Which ONE of the following components has **Not** lost cooling water?

A. Drywell equipment drain sump

B. Fuel pool cooling heat exchangers

C. Reactor water cleanup pump seal coolers

D. RWCU Non-regenerative heat exchangers

Q 8

A rupture in the control air header has occurred.

- Control air pressure indicates 25 psig and lowering in the Unit 3 Control Room.
- 3-AOI-32-2, Loss of Control Air has been entered.
- Several U3 Control Rods failed to insert during the transient.
- The US directs inserting Control Rods in accordance with 3-EOI Appendix-1D

Which ONE of the following completes the statement below?

In order to insert Control Rods the Unit Operator is required to dispatch personnel to manually _____.

A. **open** the 3-FCV-85-11A, CRD Flow Control Valve, and **open** the 3-PCV-85-27, CRD Cooling Water Pressure Control Valve

B. **close** the 3-FCV-85-11A, CRD Flow Control Valve, and **open** the 3-PCV-85-27, CRD Cooling Water Pressure Control

C. **open** the 3-FCV-85-11A, CRD Flow Control Valve, and **close** the 3-HCV-85-586, Charging Water SOV

D. **close** the 3-FCV-85-11A, CRD Flow Control Valve, and **close** the 3-HCV-85-586, Charging Water SOV

Q 9

Unit 2 is in day 2 of a forced outage with the following conditions:

- Currently in Mode 4
- Moderator Temperature band is 150° F to 180° F
- Both Reactor Recirc pumps are OFF with suction valves open and discharge valves closed
- RHR pump 2A is in Shutdown Cooling

Subsequently:

The 2B Recirc Pump discharge valve is inadvertently opened.

With no other operator actions taken, which ONE of the following completes the statements below 4 hours after the 2B Recirc Pump discharge valve opened?

The RHR outlet temperature from the 2A RHR Heat Exchanger will __ (1) __ and actual moderator temperature will __ (2) __.

A. (1) Remain the same
   (2) Remain the same

B. (1) Lower
   (2) Lower

C. (1) Rise
   (2) Rise

D. (1) Lower
   (2) Rise

Q 10

Unit 1 is loading fuel into the core when the following occurs:

- SRM period lights illuminated.
- Rising count rate on SRM meters.
- Rising power level on IRM recorders.

What **Immediate Operator Actions** are required in accordance with 1-AOI-79-2, Inadvertent Criticality During Incore Fuel Movements?

A. Return fuel bundle to previous Spent Fuel Pool location and evacuate all personnel from Refuel Floor.

B. Remove the fuel bundle from the core and traverse the Refueling Bridge away from the Reactor core.

C. Stop all fuel handling and evacuate all personnel from Refuel Floor.

D. Remove the fuel bundle from the core and if still critical initiate SLC.

Q 11

All three Units are operating at 100% power when a small steam leak develops in Unit 2 Drywell.

The Unit Supervisor directs the Unit Operator to begin venting in accordance with the AOI.

(1) How many SGT train(s) are required to be verified running prior to venting?

(2) When venting is complete, in which Unit's SR-2 should the SGT run time be recorded?

A. (1) 1
   (2) 1

B. (1) 1
   (2) 2

C. (1) 2
   (2) 1

D. (1) 2
   (2) 2

Q 12

Which ONE of the following describes a basis for Alternate Rod Insertion (ARI) due to high Reactor pressure?

A. ARI limits fuel damage due to pellet expansion to less than 1%.

B. ARI reduces the challenge to the integrity of the Reactor Coolant Pressure Boundary.

C. ARI reduces unnecessary safety relief valve operation that challenges SRV and SRV piping integrity.

D. ARI reduces unnecessary safety relief valve operation that results in undesired heatup of the Suppression Pool.

Q 13

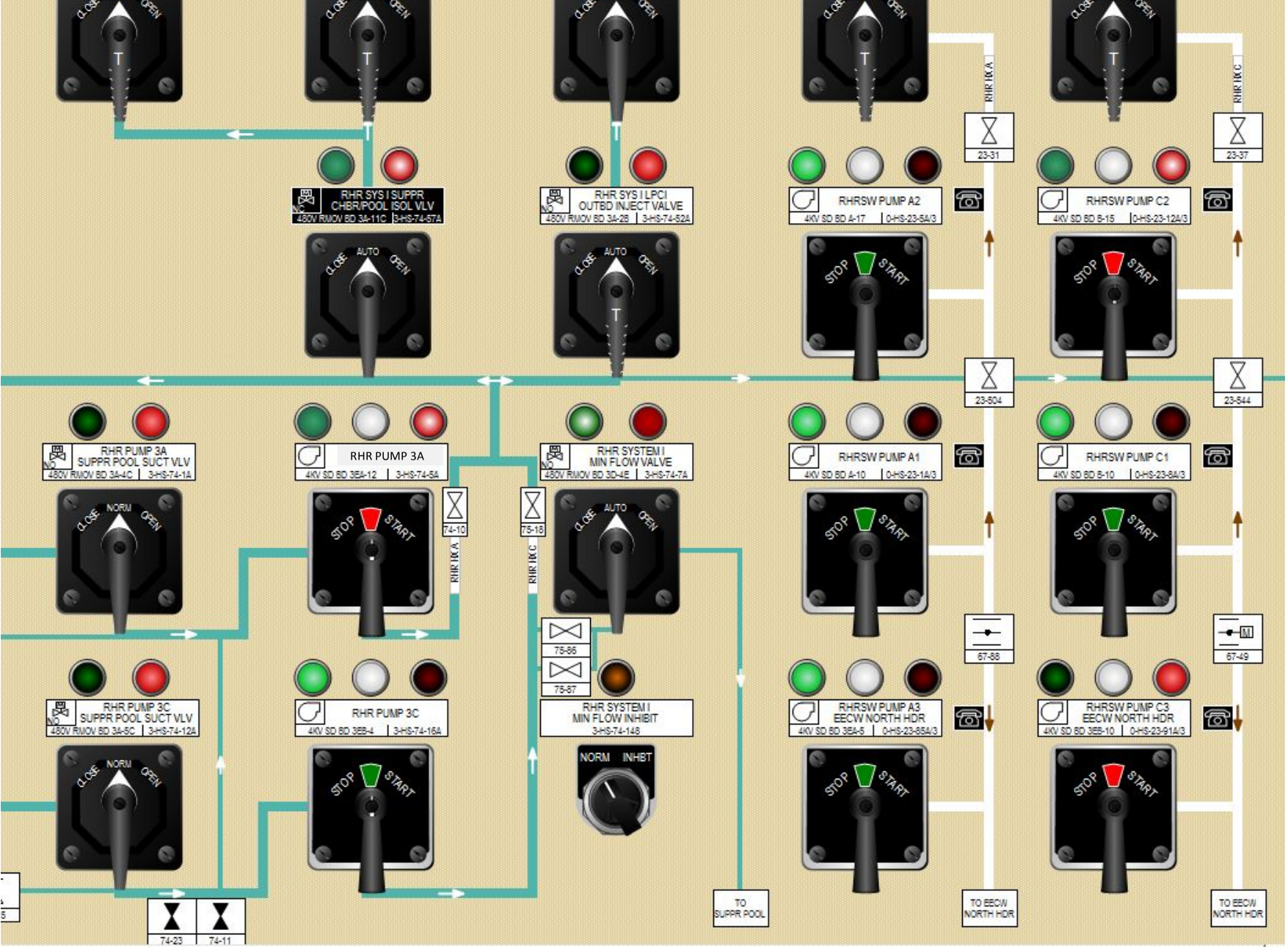
Based on the attached panel display, what changes (if any) are needed to place RHR System in Suppression Pool Cooling in accordance with 3-OI-74, Residual Heat Removal System?

A. No changes required

B. Start RHRSW Pump A2 and secure RHRSW Pump C2

C. Start RHRSW Pump A1 and open 3-FCV-23-34, 3A RHR Hx Outlet Valve

D. Fully open 3-FCV-74-59, RHR System I Suppression Pool Cooling/Test Valve


RHR SYS I SUPPR CHBR/POOL ISOL VLV
480V RMOV BD 3A-11C | 3-HS-74-57A
RHR SYS I LPCI OUTBD INJECT VALVE
480V RMOV BD 3A-2B | 3-HS-74-52A
RHRSW PUMP A2
4KV SD BD A-17 | 0-HS-23-5A/3
RHRSW PUMP C2
4KV SD BD B-15 | 0-HS-23-12A/3
RHR PUMP 3A SUPPR POOL SUCT VLV
480V RMOV BD 3A-4C | 3-HS-74-1A
RHR PUMP 3A
4KV SD BD 3EA-12 | 3-HS-74-5A
RHR SYSTEM I MIN FLOW VALVE
480V RMOV BD 3D-4E | 3-HS-74-7A
RHRSW PUMP A1
4KV SD BD A-10 | 0-HS-23-1A/3
RHRSW PUMP C1
4KV SD BD B-10 | 0-HS-23-8A/3
RHR PUMP 3C SUPPR POOL SUCT VLV
480V RMOV BD 3A-5C | 3-HS-74-12A
RHR PUMP 3C
4KV SD BD 3EB-4 | 3-HS-74-16A
RHR SYSTEM I MIN FLOW INHIBIT
3-HS-74-148
RHRSW PUMP A3 EECW NORTH HDR
4KV SD BD 3EA-5 | 0-HS-23-85A/3
RHRSW PUMP C3 EECW NORTH HDR
4KV SD BD 3EB-10 | 0-HS-23-91A/3
AUTO
NORM
INHBT
STOP
START
OPEN
CLOSE
T
23-31
23-37
23-504
23-544
74-10
75-18
75-86
75-87
67-88
67-49
74-23
74-11
RHR 10C A
RHR 10C C
TO SUPPR POOL
TO EECW NORTH HDR
TO EECW NORTH HDR

Q 14

In accordance with EOI Caution 1, LI-3-55 Reactor Water Level Flood-up Range, indicates above the minimum indicated level (MIL).

DW Temp and Reactor Pressure are in the Action Required region of Curve 8, RPV Saturation Curve.

Which ONE of the following completes the statement below?

LI-3-55 __ (1) __ due to __ (2) __.

A. (1) may **Not** be used
   (2) boiling in the instrument run

B. (1) may be unreliable
   (2) boiling in the instrument run

C. (1) may **Not** be used
   (2) being calibrated for cold conditions

D. (1) may be unreliable
   (2) being calibrated for cold conditions

Q 15

Annunciator 3-9-3B window 15, SUPPR CHAMBER WATER LEVEL ABNORMAL is currently in alarm due to Low SP Water Level.

Which ONE of the following answer choices provides indication supporting a lowering Suppression Pool Level trend?

A. Drywell-to-Suppression Chamber Differential pressure is lowering.

B. 3-9-3C window 9 RCIC PUMP SUCTION PRESS LOW 3-PA-71-21A alarms.

C. 3-9-3E window 11 SUPPR POOL DISCH HDR PRESS LOW 3-PA-74-94 alarms.

D. HPCI Pump Suction valves automatically realign.

Q 16

An ATWS has occurred on Unit 2.

- ATWS actions are complete
- Reactor water level currently indicates +40 inches
- Reactor Power is 46%
- SLC is injecting

Which ONE of the following completes the statements below?

EOI-1A requires operators to stop and prevent all injection except __ (1) __ to mitigate the consequences of the failure-to-scram.

Intentionally lowering Reactor Water Level mitigates the failure to scram by __ (2) __.

A. (1) CRD, and SLC only
(2) reducing natural circulation resulting in increased void fraction

B. (1) CRD, and SLC only
(2) increasing natural circulation resulting in mixing of injected boron

C. (1) RCIC, CRD, and SLC
(2) reducing natural circulation resulting in increased void fraction

D. (1) RCIC, CRD, and SLC
(2) increasing natural circulation resulting in mixing of injected boron

Q 17

In accordance with step ARC-1 and NOTE 1 of EOI-1A, ATWS RPV Control, which ONE of the following conditions would allow exiting EOI-1A and entering EOI-1, RPV Control?

A. All Control Rods inserted to 00 except 18 at notch 02

B. All Control Rods inserted to 00 except 2 at notch 18

C. SLC injected into RPV to a tank level of 60%

D. SLC injected into RPV to a tank level of 40%

Q 18

All three units are operating at 100% power.

A transient occurs on Unit 2 and the following alarms are received:

- 2-9-4C window 27 OG AVG ANNUAL RELEASE LIMIT EXCEEDED
- 2-9-3A window 13 STACK GAS RADIATION HIGH
- 2-9-7A window 3 STACK GAS DILUTION AIR FLOW LOW

The Unit 2 UO reports the following:

- Stack dilution fan 2A tripped and 2B failed to start
- 0-FI-90-271 Stack Gas Flow on Panel 1-9-53 indicates 14,000 scfm

Based on the information provided which ONE of the following identifies the Stack Gas Radiation Monitor(s) with valid indications.

A. None of the Stack Gas Radiation Monitor indications are valid.

B. Only 0-RM-90-306 WRGERMS indication is valid.

C. Only 0-RM-90-147/148 Stack Gas Monitor indications are valid.

D. 0-RM-90-306 WRGERMS and 0-RM-90-147/148 Stack Gas Monitor indications are valid.

Q 19

A fire has occurred in the Unit 3 Reactor Building.

In accordance with 0-AOI-26-1, Fire Response, the reason AUOs are assembled in the Control Room is to…

A. perform required SSI manual actions.

B. complete personnel accountability.

C. retrieve the Control Room Appendix R radios.

D. retrieve necessary SCBA Kits.

Q 20

In accordance with 0-AOI-57-1E, Grid Instability, what is the **maximum** MVAR outgoing limit to maintain the offsite qualification of both 500-Kv and161-Kv offsite power sources?

A. + 50

B. + 100

C. + 150

D. + 300

Q 21

Unit 3 is operating at 100% power when all three Reactor Feed Pump Turbines trip.

The Reactor is manually scrammed and 3-EOI-1 is entered.

As Reactor water level lowers, receipt of which alarm below corresponds to the level at which a Reactor Recirc Pump trip is required?

A. 3-9-5A window 8, REACTOR WATER LEVEL ABNORMAL

B. 3-9-3F window 29, RX WTR LVL LOW LOW HPCI/RCIC INIT

C. 3-9-3C window 28, RX WTR LVL LOW LOW LOW ECCS/ESF INIT

D. 3-9-3C window 3, REACTOR LEVEL LOW ADS BLOWDOWN PERMISSIVE

Q 22

Unit 2 is operating at 100% Power.

Subsequently:
A transient results in the following:

- 2-9-4C window 35 OG POST TRTMT RAD MONITOR Hi-Hi-Hi/INOP alarms and will **NOT** reset.

- The Automatic and Immediate actions of 2-AOI-66-2, Offgas Post-Treatment Radiation HI-HI-HI were completed.

ASSUME NO OTHER OPERATOR ACTIONS ARE PERFORMED.

Which ONE of the following describes the expected system response?

The SJAE in service prior to the event will __ (1) __.

The indication on 0-RM-90-147/148 Stack Gas RAD Monitors one hour after the immediate actions of 2-AOI-66-2 are complete will __ (2) __ they indicated prior to the transient.

A. (1) remain in service
   (2) be lower than

B. (1) remain in service
   (2) remain the same as

C. (1) shutdown
   (2) be lower than

D. (1) shutdown
   (2) remain the same as

Q 23

Due to an error while performing surveillance testing on Unit 2, a Secondary Containment isolation was initiated.

In accordance with 0-OI-65, Standby Gas Treatment System, which ONE of the following completes the statement below?

The SGT Relative Humidity heaters will ___(1)___.

The Refuel Zone Exhaust to SGT dampers 1-FC0-064-0044 & 0045, __ (2) __ auto open.

A. (1) energize
   (2) will

B. (1) energize
   (2) will Not

C. (1) de-energize
   (2) will

D. (1) de-energize
   (2) will Not

Q 24

Unit 1 Suppression Pool Level is + 5.5 inches.

Which ONE of the following completes the statements below?

HPCI Suction __ (1) __ automatically transfer to the Suppression Pool.
RCIC Suction __ (2) __ automatically transfer to the Suppression Pool.

A. (1) will
(2) will

B. (1) will
(2) will **Not**

C. (1) will **Not**
(2) will

D. (1) will **Not**
(2) will **Not**

Q 25

Unit 2 is operating at 100% Power when 2-9-3D window 24 MAIN STEAM LINE LEAK DETECTION TEMP HIGH alarms.

The BOP Operator reports that 2-TIS-1-60A; MN STEAM TUNNEL TEMP indicates170 °F and rising.

Which ONE of the following completes the statements below?

An EOI-3 entry condition __ (1) __ been met.

The MSIV closure setpoint for the Steam Tunnel temperature is __ (2) __ °F.

A. (1) has
   (2) 189

B. (1) has
   (2) 315

C. (1) has Not
   (2) 189

D. (1) has Not
   (2) 315

Q 26

Unit 1 is in Mode 5, Units 2 and 3 are in Mode 1.

A Refueling accident occurs on Unit 1 resulting in the following readings:

1-RM-90-140/142

- Reactor Zone 1-RM-90-142A indicates 65mr/hr
- Reactor Zone 1-RM-90-142B indicates 67mr/hr
- Refuel Zone 1-RM-90-140A indicates 75mr/hr
- Refuel Zone 1-RM-90-140B indicates 78mr/hr

1-RM-90-141/143

- Reactor Zone 1-RM-90-143A indicates 68mr/hr
- Reactor Zone 1-RM-90-143B indicates down scale
- Refuel Zone 1-RM-90-141A indicates 70mr/hr
- Refuel Zone 1-RM-90-141B indicates 69mr/hr

Which ONE of the following identifies the ventilation response?

A. Refuel Zone isolation only

B. Reactor and Refuel Zone isolation

C. Reactor Zone isolation and CREV auto initiation

D. Refuel Zone isolation and CREV auto initiation

Q 27

The Radwaste Operator reports that Unit 1 Reactor Building Floor Drain Sump B level is 50 inches and rising with the B Sump pump running.

Which ONE of the following completes the statements below?

An EOI-3, Secondary Containment Control, entry condition is first met when level rises an additional __ (1) __ inches.

In accordance with the EOI Program Manual Section 0-V-E, EOI-3 Secondary Containment Control Bases, the reason for isolating a system that is discharging into Secondary Containment is to __ (2) __.

A. (1) 16
   (2) terminate the radioactivity release

B. (1) 16
   (2) maintain Reactor Building pressure negative

C. (1) 25
   (2) terminate the radioactivity release

D. (1) 25
   (2) maintain Reactor Building pressure negative

Q 28

A loss of coolant accident occurred on Unit 3
The following conditions exist:

- 3A RHR pump is running in LPCI mode
- Reactor water level has been stabilized at +15 inches
- Drywell spray was initiated using 3B RHR pump
- Drywell Temperature is 250 °F and slowly lowering
- Drywell Pressure is 13 psig and slowly lowering

Subsequently:

- 3-9-3D window 29 RHR/CS DIV I TEMP HIGH alarms
- The Reactor Building AUO reports that the 3A RHR Room Cooler is **NOT** running and would **NOT** start using the local pushbutton

Which ONE of the following completes the statements below?

Place RHR pump __ (1) __ in service in LPCI mode and secure 3A RHR pump.

The lowest temperature at which the RHR Room Cooler will auto start is__ (2) __ if it is not already running.

A. (1) 3C
   (2) 95 °F

B. (1) 3D
   (2) 95 °F

C. (1) 3C
   (2) 148 °F

D. (1) 3D
   (2) 148 °F

Q 29

What is the power supply for RHR SYS II INBD INJECTION VLV, 2-FCV-74-67?

480 V RMOV Board…

A. 2A

B. 2B

C. 2D

D. 2E

Q 30

HPCI is running in pressure control in accordance with 2-EOI Appendix-11C, Alternate RPV Pressure Control Systems HPCI Test Mode when the following event occurs:

- Condensate Storage Tank (CST) level dropped below 6800 gallons.

What is the current status of the HPCI system?

HPCI is…

A. operating in pressure control with suction from the CST.

B. operating in pressure control with suction from the Suppression Pool.

C. operating at shutoff head with suction from the Suppression Pool.

D. tripped on low suction pressure.

Q 31

Unit 1 Core Spray is being shut down following an automatic actuation in accordance with 1-OI-75, Core Spray, section 7.1 Core Spray System Shutdown.

At what flow is the Minimum Flow Valve, 1-FCV-75-9(37) expected to open when the Inboard Injection Valve, 1-FCV-75-25(53) is throttled closed?

A. 900 gpm

B. 1350 gpm

C. 2200 gpm

D. 2600 gpm

Q 32

Given the following conditions:

- A Unit 1 ATWS occurred
- During the performance of 1-EOI-Appendix 3A, SLC INJECTION, the Standby Liquid Control (SLC) pump control switch was placed in the START- A position
- SQUIB VALVE A CONTINUITY blue light is illuminated
- SQUIB VALVE B CONTINUITY blue light is extinguished
- SLC INJECTION FLOW TO REACTOR (Panel 1-9-5B, Window 14) is in alarm

Which ONE of the following completes the statements below?

The SLC Squib valve ___ (1) ___ is OPEN.
The time to inject Hot Shutdown Boron Weight is ___ (2) ___ compared to the time with both squib valves open.

A. (1) A
   (2) the same

B. (1) A
   (2) longer

C. (1) B
   (2) the same

D. (1) B
   (2) longer

Q 33

2-SR-3.1.4.1, SCRAM Insertion Times, is in progress.

- At Panel 2-9-16 the UO performs the actions to test Control Rod 26-43, and returns the SCRAM TEST switch back to the NORMAL position.

What is the status of the scram blue light for control rod 26-43 on the full core display?

A. Illuminated while the SCRAM TEST switch is in the TEST position, but extinguishes **immediately** when placed back in NORMAL (power restored).

B. Illuminated while the SCRAM TEST switch is in the TEST position, but extinguishes when **either** scram valves reclose (limit switch).

C. Illuminated until the SCRAM RESET switch on panel 9-5 is placed in **either** the GRP 2/3 or 1/4 position.

D. Illuminated until the SCRAM RESET switch on panel 9-5 is placed in **both** the GRP 2/3 and GRP 1/4 positions.

Q 34

A reactor plant startup is being conducted on Unit 2 in accordance with GOI-100-1A, Unit Startup and Power Operation.

- The reactor is critical and SRM/IRM overlap data has just been completed.
- All SRMs are reading between 5.0 X 10^3 and 1.0 X 10^4 cps.
- All IRMs are mid scale on range 1.
- The operator has inadvertently selected both the SRMs and the IRMs for withdraw.

Which ONE of the following Control Rod Blocks will be the **first** automatic action to occur as the detectors are withdrawn?

A. SRM Detector Wrong position

B. IRM Detector Wrong position

C. SRM Downscale

D. IRM Downscale

Q 35

What are the power supplies to the SRM Channels/detectors?

SRM Channels/Detectors _____.

A. A & B are powered from the A channel ± 24VDC System and C & D are powered from the B channel ± 24VDC System

B. A & C are powered from the A channel ± 24VDC System and B & D are powered from the B channel ± 24VDC System

C. A & B are powered from Division I, 250 VDC System and C & D are powered from Division II, 250 VDC System

D. A & C are powered from Division I, 250 VDC System and B & D are powered from Division II, 250 VDC System

Q 36

Unit 2 is operating at power.

Given that Core Flow is 65%, APRM 1 will display which approximate Rod Block setpoint?

A. 102

B. 108

C. 113

D. 119

Q 37

How many LPRM detectors are assigned to each APRM channel and how many LPRM detectors are in each LPRM string?

A. 21; 3

B. 21; 4

C. 43; 3

D. 43; 4

Q 38

What Reactor Core Isolation Cooling (RCIC) design feature provides for the prevention of water hammer?

A. Suction head pressure provided by the CST

B. Minimum flow valve automatic operation

C. System snubbers

D. Low pressure isolation

Q 39

During a Unit 1 ATWS, the UO places ADS LOGIC INHIBIT switches 1-XS-1-159A and 1-XS-1-161A in inhibit then reports:

- 1-9-5 window 18 ADS LOGIC BUS A INHIBITED failed to alarm.
- 1-9-5 window 31 ADS LOGIC BUS B INHIBITED is in alarm.

Which ONE of the following completes the statement below?

In accordance with 1-ARP-9-3C window 18 the UO will direct an AUO to _____.

A. open the ADS System Logic Bus A breaker on 250V RMOV board 1B

B. pull 250V Logic A fuses on Panel 1-9-30 in the Auxiliary Instrument room

C. place all ADS transfer switches in emergency at Panel 1-25-32, Backup Control Panel

D. pull all ADS Solenoid power fuses at Panel 1-25-32, Backup Control Panel

Q 40

Which ONE of the following completes the statements below?

Reactor Water Level Instruments,__ (1) __ provide the Reactor Vessel water level Low-Low-Low initiation signal to ADS logic.

RHR or Core Spray pumps __ (2) __ required to be running to initiate the ADS timers.

NOTE: LIS-3-184 is Reactor Water Level A
LIS-3-185 is Reactor Water Level B
LIS-3-58A through D is Reactor Water Level A through D

A. (1) LIS-3-58A through D
(2) are

B. (1) LIS-3-58A through D
(2) are Not

C. (1) LIS-3-184 and LIS-3-185
(2) are

D. (1) LIS-3-184 and LIS-3-185
(2) are Not

Q 41

What design feature allows testing of MSIV Reactor Water Level Instrumentation associated with Primary Containment Isolation System (PCIS) without causing a device actuation?

A. 1 out of 2 taken twice logic

B. 2 out of 3 logic

C. 2 out of 4 voter logic

D. 2 out of 2 taken once logic

Q 42

How are the ADS MSRVs affected by a loss of Drywell Control Air (DWCA)?

ADS MSRVs will…

A. Not operate in the Manual mode.

B. operate a **minimum** of three times in the Manual mode.

C. operate a **minimum** of five times in the Manual mode.

D. operate indefinitely in the Manual mode.

Q 43

Unit 3 is operating at 100% power, with the following feedwater alignment:

- Reactor Water Level Master Controller in **MAN**
- A RFPT Speed Controller in **AUTO** at 5000 RPM
- B RFPT Speed Controller in **AUTO** at 4995 RPM
- C RFPT Speed Controller in **MAN** at 5005 RPM

How will Reactor Feed Pumps respond when the Reactor Water Level Master Controller raise pushbutton is depressed?

A. A, B and C RFPT speeds increase.

B. A, B and C RFPT speeds remain the same.

C. A and B RFPT speeds increase; RFPT C speed remains the same.

D. A and B RFPT speeds remain the same; RFPT C speed increases.

Q 44

Which ONE of the following (if any) identifies the suction source(s) that can be aligned for the Standby Gas Treatment Fans with respect to the Primary Containment System?

A. None

B. Drywell ONLY

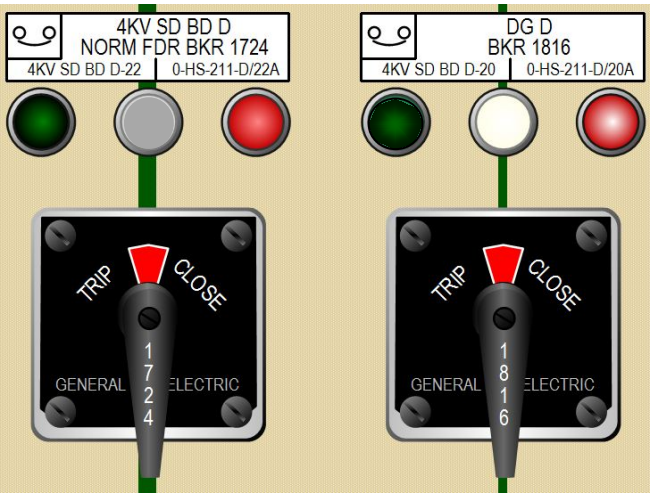
C. Suppression Chamber ONLY

D. Drywell and Suppression Chamber

Q 45

Unit 2 is performing 0-SR-3.8.1.1(D), Diesel Generator D Monthly Operability; the Diesel has been loaded for 30 minutes.

The following indications have **just occurred**.



Which ONE of the following completes the statements below?

The white light above BKR 1816 is a __ (1) __.

Based on these conditions the first expected response is __ (2) __.

A. (1) disagreement indication
(2) DG D Breaker 1816 will trip open

B. (1) disagreement indication
(2) 4KV SD D Normal FDR BKR 1724 will trip open

C. (1) Diesel Generator Overload indication
(2) DG D Breaker 1816 will trip open

D. (1) Diesel Generator Overload indication
(2) 4KV SD D Normal FDR BKR 1724 will trip open

Q 46

All three Units are operating at 100% power.

- 240V Lighting Board 2A is tagged out of service for scheduled work.
- An electrical fault causes 240 V Lighting Board 3B to deenergize.

Which ONE of the following completes the statements below?

The Plant Preferred MG will start __ (1) __ and energize __ (2) __on all 3 units.

A. (1) immediately
   (2) Panel 9-9 cabinet 4

B. (1) immediately
   (2) Panel 9-9 cabinet 5

C. (1) after a 6 second time delay
   (2) Panel 9-9 cabinet 4

D. (1) after a 6 second time delay
   (2) Panel 9-9 cabinet 5

Q 47

Unit 1 is operating at 100% Power.

1-9-8B window 35 UNIT PFD SUPPLY ABNORMAL alarms

The Control Bay AUO reports the following lights illuminated at the Unit 1 Unit Preferred System Inverter:

- 1-IL-252-0001L (Red Lamp) Inverter Fuse Blown
- 1-IL-252-0001D (Red Lamp) Alternate Source Supplying Load

ASSUME NO OPERATOR ACTIONS HAVE BEEN PERFORMED.

Which ONE of the following completes the statement below?

The Unit 1 Unit Preferred loads are being supplied through the_____.

A. Unit Preferred Inverter Static Switch

B. Alternate supply to 1-PNL-9-9 cabinet 6 only

C. UNIT PFD XFMR1 TO BATTERY BD 1 ALT FDR, 0-BKR-280-001/1002

D. UNIT PFD MMG SET 2 TO BATT BD 1 EMERG FDR, 0-BKR-001/1003

Q 48

All three Units are operating at 100% power when the following alarm is received:

- Panel 1/2-9-23B, Window 17 DIESEL GEN B BAT CHGR OR EXH FAN ABN

What local indication does the AUO have to diagnose that the cause of the alarm is the 125 VDC Battery Charger?

A. Local relay targets on the front of the charger.

B. B Diesel Generator room Emergency lights illuminated.

C. Voltage meter on the front of the battery charger.

D. Central Diesel Information Center Alarm Panels.

Q 49

All three Units are operating at 100% power.

Subsequently,

4KV SD BUS 2 de-energizes.

Which ONE of the following completes the statements below?

The “D” and __ (1) __ Diesel Generators will auto start.

In accordance with 0-OI-82, Standby Diesel Generator System, the Diesel Generator Maximum Continuous steady-state active power output (KW) is limited to __ (2) __.

A. (1) B
   (2) 2600 kW

B. (1) B
   (2) 2860 kW

C. (1) C
   (2) 2600 kW

D. (1) C
   (2) 2860 kW

Q 50

Which ONE of the following completes the statement below?

When Control Air is lost, the Drywell Control Air System…

A. loses its only backup source of pneumatics.

B. loses one of two backup sources of pneumatics.

C. slowly depressurizes.

D. remains pressurized due to installed accumulators.

Q 51

The G Control Air Compressor is in service with the other Control Air Compressors A, B, C, and D in Standby in accordance with 0-OI-32, Control Air System.

Subsequently, the G Control Air compressor trips.

How do the other Control Air Compressors respond as pressure lowers to 90 psig?

A. Only those compressors which are selected as lead start.

B. All compressors start on a common setpoint simultaneously.

C. The compressors which are selected as lead start followed by the lag compressors with a 2 psig offset between them.

D. All control air compressors start one at a time with a 2 psig offset between them.

Q 52

All three units are operating at 100% power.
The A3 RHRSW pump is tagged for motor replacement.

Subsequently:

The C-3 EECW pump trips and the AUO reports that the pump is hot to the touch.

In accordance with 0-OI-67, Emergency Equipment Cooling Water System, which ONE of the following completes the statements below?

RHRSW pump __ (1) __ can be aligned to EECW in place of the C-3 RHRSW pump.

This pump __ (2) __ the same AUTO start signals as the C-3 RHRSW pump.

A. (1) C-1
   (2) has

B. (1) C-1
   (2) does Not have

C. (1) C-2
   (2) has

D. (1) C-2
   (2) does Not have

Q 53

Which way does 1-FCV-70-1, RBCCW Surge Tank fill valve, fail and where do you send someone to control level in the RBCCW Surge Tank?

A. Open; Reactor Building EL 639 foot.

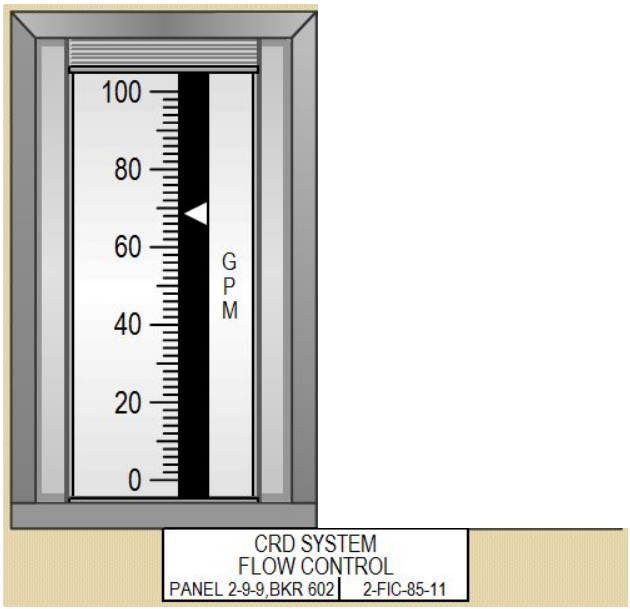
B. Open; Reactor Building EL 593 foot.

C. Closed; Reactor Building EL 639 foot.

D. Closed; Reactor Building EL 593 foot.

Q 54

Unit 2 is operating at 100 % power with the following indication:



Which ONE of the following completes the statements below?

In accordance with 2-OI-85, Control Rod Drive System, The Control Rod Drive system flow __ (1) __ in the normal band.

The next time the UO adjusts CRD system flow, Calculated Thermal Power __ (2) __ be affected.

A. (1) is
(2) will

B. (1) is
(2) will Not

C. (1) is Not
(2) will

D. (1) is Not
(2) will Not

Q 55

How much flow is provided to the CRD to get the collet fingers released from the notch in the index tube during a normal control rod withdrawal?

Which direction does the Unit Operator throttle the PCV-85-23, CRD Drive Water pressure control valve to raise Drive Water differential pressure?

A. (1) 2 gpm
   (2) open

B. (1) 2 gpm
   (2) closed

C. (1) 4 gpm
   (2) open

D. (1) 4 gpm
   (2) closed

Q 56

Unit 3 is operating at 100% power when the following occurs:

- The 3C RFPT tripped
- Reactor Water level lowered to + 25 inches on the Normal Range instruments.

What is the expected response of the Reactor Recirc System?

Recirc Pumps' speeds lower to achieve…

A. 480 rpm.

B. 1130 rpm.

C. a core flow of 60 Mlbm/hr.

D. a steam flow of 10.9 Mlbm/hr.

Q 57

As Reactor Power rises past 25%, what provides a signal to the Rod Block Monitor (RBM) to begin enforcing Control Rod Blocks?

A. Local Power Range Monitor

B. Average Power Range Monitor

C. Total Steam Flow

D. Total Feedwater Flow

Q 58

Unit 3 is operating at 100% Rx Power with the following indications and alarms present:

- DRYWELL DP AIR COMP DISCH AIR TEMP HIGH, Panel 9-3B window 33
- DRYWELL TO SUPPR CHAMBER DIFF PRESS ABNORMAL, Panel 9-3B window 26
- DRYWELL TO SUPPR CHAMBER DIFF PRESS, 3-PDS-64-137C is reading 1.41 psid
- DRYWELL TEMPERATURE, 3-TE-64-52C is reading 135 °F
- Drywell DP Compressor is running

Which ONE of the actions below describes the highest priority?

A. Stop the DP Air Compressor

B. Bypass the DP Air compressor TCV

C. Open the DP Air Compressor Bypass Valve

D. Blow down RCW to the DP Air Compressor after cooler

Q 59

During Refueling Operations with the Reactor mode switch in the refuel position, the following events occur:

- A fuel bundle is pulled to full up from its spent fuel pool location.
- The bridge is then driven over the core to its new location and the Refueling Bridge operator starts lowering the fuel bundle into the core.
- **NO** Rod Block alarm is received during this evolution.

Based on the events that just occurred what action is **immediately required** by Tech Specs?

A. Suspend in-vessel fuel movement.

B. Insert a control rod withdrawal block only.

C. Verify all control rods are fully inserted only.

D. Place the reactor mode switch in the shutdown position.

Q 60

The following plant conditions exist on Unit 2:

- Main Turbine Shell Warming is in progress
- The UO is pulling Control Rods in accordance with 3-GOI-100-1, Unit Startup

3-OI-47, Turbine-Generator System section 5.2 Turbine Shell Warming cautions the Operators that a Reactor Scram may result when Main Turbine First stage pressure exceeds _____ psig.

A. 105

B. 115

C. 147

D. 165

Q 61

The Unit 1 Main Generator synchronization is in the progress IAW 1-GOI-100-A, Unit Startup.

The following indications are observed on panel 1-9-8:

- VOLTAGE REGULATOR MAN/AUTO in MAN
- GEN SYNC REF VOLTAGE, 1-E-57-54 is reading 27 V
- SYSTEM SYNC REF VOLTAGE is reading 28 V
- SYNCHROSCOPE 1-XI-57-55 is stopped at the 6:00 position

In accordance with 1-OI-47 before the Generator PCB 214 is closed, the operator must go to __ (1) __ on the Voltage Regulator Lower/Raise Adjust Switch to match voltages.

The operator must also go to __ (2) __ on the Turbine Generator Synch Speed INC/DEC Adjust Switch until the Synchroscope is moving slowly in the clockwise direction.

A. (1) raise
   (2) INC

B. (1) raise
   (2) DEC

C. (1) lower
   (2) INC

D. (1) lower
   (2) DEC

Q 62

What is the effect on the Reactor Feedwater System from a loss of **120V I&C Bus A**?

A. RPFT 2B Woodward Governor loses power.

B. RFP 2C Minimum Flow Valve fails open.

C. RFW Start-up Level Control PDS controls are rendered inoperative.

D. RFPT/RFP 2A Vibration Monitoring Equipment loses indication.

Q 63

The Waste Collector Tank **normally** receives discharge from which system drains?

A. Floor

B. Laundry

C. Laboratory

D. Equipment

Q 64

What is the power supply to the Stack-Gas Radiation Monitor (0-RM-90-147 & 148) scintillation detectors?

A. Unit 1 (±) 24 VDC Neutron Monitoring Battery System

B. Unit 2 (±) 24 VDC Neutron Monitoring Battery System

C. Unit 1 120 VAC Reactor Protection System

D. Unit 2 120 VAC Reactor Protection System

Q 65

A fire has been reported in Unit 2 Auxiliary Instrument Room and the CO_2 System failed to automatically or manually initiate.

The Unit Supervisor has ordered the AUO to manually initiate CO_2 using the Pilot Control Valve Station(s).

How will the CO_2 System respond when the pilot valve lever is placed in the OPEN position?

CO_2 will be dispensed ___ (1) ___ and the evacuation alarm ___ (2) ___ sound.

A. (1) immediately
   (2) will

B. (1) immediately
   (2) will Not

C. (1) after 60 sec time delay
   (2) will

D. (1) after 60 sec time delay
   (2) will Not

Q 66

What is the frequency of panel walk downs in accordance with OPDP-1, Conduct of Operations?

The Unit Operator is to perform a panel walk down a minimum of once _____.

A. per hour

B. every 2 hours

C. every 4 hours

D. every 6 hours

Q 67

In accordance with 2-GOI-100-1A, Unit Startup and Power Operation, there are Initial Steps that contain an (R) before that step, what requirement is imposed?

The step…

A. requires Radiation Protection notification only.

B. requires holding for Radiation Protection, (RP Hold Point).

C. indicates a restriction on Reactor Power, prior to proceeding.

D. is required and shall not be omitted, unless permitted in the step.

Q 68

In accordance with ODM-4.5, Operator Aids and Operator Information System, how does the Unit Operator determine during the panel walk down, that a system is aligned correctly?

The normally running pumps shall have a ___ (1) ___red lens cover.

The normally closed valves shall have a ___ (2) ___ green lens cover.

A. (1) clear
   (2) clear

B. (1) diffused
   (2) diffused

C. (1) diffused
   (2) clear

D. (1) clear
   (2) diffused

Q 69

Unit 1 is performing a startup in accordance with 1-GOI-100-1A, Unit Startup.

During control rod notch withdrawal, prior to criticality, SRM PERIOD, (1-9-5A, Window 20), alarms and **seals in**.

What action(s) is/are required by 1-GOI-100-1A?

A. **PAUSE** Control Rod withdrawal until a stable period of greater than 100 seconds is observed.

B. **REINSERT** the last Control Rod withdrawn to obtain a stable period greater than 60 seconds.

C. **INSERT** Control Rods and **ENSURE** the Reactor is brought subcritical.

D. **SHUTDOWN** the Reactor until a thorough assessment has been performed.

Q 70

Which ONE of the following completes the statement below?

In accordance with NPG-SPP-07.3.4, Protected Equipment, when unscheduled work requires protecting equipment, it is required to be posted as Protected Equipment unless the expected unavailability time is less than __ (1) __.

A. the duration of the current shift

B. the duration of the following shift

C. 12 hours

D. 24 hours

Q 71

Which ONE of the following meets the requirements to be considered a "Complex Infrequently Performed Test or Evolution" (CIPTE) per NPG-SPP-06.9.1, Conduct of Testing?

A. Switching Order to remove the West Point 500KV line

B. 0-SR-3.8.1.9(A) Diesel Generator A Emergency Unit 1 Load Acceptance Test

C. 1-SR-3.5.1.7(COMP), HPCI Comprehensive Pump Test (IST Data)

D. 1-SR-3.5.1.6(RHR I) Quarterly RHR System Rated Flow Test Loop I

Q 72

Which ONE of the following completes the statement below?

The Wide Range Gaseous Effluent Radiation Monitor System (WRGERMS) consists of__ (1) __ ranges, AND can be monitored remotely from__ (2) __.

A. (1) two
   (2) all three Units Control Room

B. (1) two
   (2) the Unit 2 Control Room

C. (1) three
   (2) all three Units Control Room

D. (1) three
   (2) the Unit 2 Control Room

Q 73

Which ONE of the following completes the statements below in accordance with RCI-9.1, Radiation Work Permits?

During an emergency situation, the Shift Manager has authorized immediate entry for Maintenance personnel into a High Radiation Area for which an RWP is not current.

Radiation Protection __ (1) __ be required to escort personnel entering the area.

When the area has been exited and the emergency situation is over, an RWP __ (2) __ required to be completed for this entry.

A. (1) will
   (2) is

B. (1) will
   (2) is Not

C. (1) will Not
   (2) is

D. (1) will Not
   (2) is Not

Q 74

Which of the following is an **ENTRY CONDITION** into the Emergency Operating Instructions (EOI) and what is the overall mitigating strategy as directed by that EOI?

A. RPV Pressure above 1050 psig; Maintain adequate core cooling.

B. Suppression Pool Level above (-) 1 inch; Maintain the integrity of Primary Containment.

C. Rx power >5% or unknown; Expedite plant cooldown to place the reactor in the lowest energy state.

D. Spent Fuel Pool Temperature above 100 ºF; Maintain the continued operability of equipment needed to carry out the EOIs.

Q 75

Unit 1 is operating at 100% power.

Which ONE of the following completes the statement below?

When assessing the EOI Exclusion Plot Status Boxes on the Safety Parameter Display System (SPDS):

__ (1) __ is expected to be colored “red” because current plant operation __ (2) __ within the “Safe” region of the curve.

A. (1) Curve 6, Press Suppr Press
   (2) is

B. (1) Curve 6, Press Suppr Press
   (2) is Not

C. (1) Curve 5, DW Spray Init Limit
   (2) is

D. (1) Curve 5, DW Spray Init Limit
   (2) is Not

Test: _____

Class: _____

Instructor: _____

LXR•TEST™ Response Form LXR-20020 Side 1

Name: _____

Signature: _____

Date: _____

READ CAREFULLY!

OK NOT OK

- Use black ink only.
- Mark responses darkly and fill completely.
- Erase unwanted marks clearly.
- Do NOT make any stray marks on the page.
- No credit will be given for improper marks.
- If Side 2 is used, fill in ID on both sides.

DOCKET NUMBER

Version

C 1 C 2 C 3 C 4 V

SECTION 1

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

SECTION 2

1 2 3

4 5 6

7 8 9

10 11 12

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