Final Submittal
(Blue Paper)

FINAL RO

WRITTEN EXAMINATION

AND REFERENCES

U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date: 11/10/2008	Facility/Unit: Brunswick / 1 & 2
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

As administered RO exam

Brunswick NRC RO Exam November 2008

Name: ANSWER KEY - RO Date: 11/10/08

1.	A	**C**	C	D	26.	A	B	**D**	D	51.	A	**C**	C	D
2.	A	B	**D**	D	27.	A	**C**	C	D	52.	A	B	C	**D**
3.	A	**C**	C	D	28.	**B**	B	C	D	53.	**B**	B	C	D
4.	A	B	**D**	D	29.	A	B	**D**	D	54.	A	**C**	C	D
5.	**B**	B	C	D	30.	A	B	C	**D**	55.	A	**C**	C	D
6.	A	B	C	**D**	31.	A	B	C	**D**	56.	A	B	C	**D**
7.	**B**	B	C	D	32.	A	B	C	**D**	57.	A	B	**D**	D
8.	A	B	C	**D**	33.	A	B	**D**	D	58.	A	B	C	**D**
9.	**B**	B	C	D	34.	**B**	B	C	D	59.	**B**	B	C	D
10.	A	B	C	**D**	35.	A	B	**D**	D	60.	**B**	B	C	D
11.	A	B	C	**D**	36.	A	**C**	C	D	61.	A	B	**D**	D
12.	**B**	B	C	D	37.	A	B	**D**	D	62.	**B**	B	C	D
13.	A	B	**D**	D	38.	**B**	B	C	D	63.	A	B	C	**D**
14.	A	B	**D**	D	39.	A	**C**	C	D	64.	A	B	**D**	D
15.	A	**C**	C	D	40.	A	B	**D**	D	65.	**B**	B	C	D
16.	A	**C**	C	D	41.	A	B	C	**D**	66.	A	B	**D**	D
17.	A	B	**D**	D	42.	A	B	C	**D**	67.	A	B	**D**	D
18.	**B**	B	C	D	43.	A	B	**D**	D	68.	A	B	C	**D**
19.	**B**	B	C	D	44.	**B**	B	C	D	69.	**B**	B	C	D
20.	A	B	**D**	D	45.	**B**	B	C	D	70.	A	**C**	C	D
21.	A	**C**	C	D	46.	A	B	**D**	D	71.	A	**C**	C	D
22.	A	B	**D**	D	47.	A	B	C	**D**	72.	A	**C**	C	D
23.	A	B	**D**	D	48.	A	B	**D**	D	73.	A	B	C	**D**
24.	A	B	**D**	D	49.	A	B	C	**D**	74.	A	**C**	C	D
25.	A	**C**	C	D	50.	A	B	**D**	D	75.	A	B	C	**D**

1. Which one of the following identifies the component manipulations that will raise CRD drive water header differential pressure indication at Panel P603?

   A. throttle open Flow Control Valve C11-F002 or
      throttle open Drive Pressure Valve C11-PCV-F003

   B. throttle open Flow Control Valve C11-F002 or
      throttle closed Drive Pressure Valve C11-PCV-F003

   C. throttle closed Flow Control Valve C11-F002 or
      throttle open Drive Pressure Valve C11-PCV-F003

   D. throttle closed Flow Control Valve C11-F002 or
      throttle closed Drive Pressure Valve C11-PCV-F003

2. Unit Two is operating at rated pressure. While placing the 2B Recirculation Pump in service a complete failure of the #1 seal occurs.

   #1 seal cavity pressure is 1000 psig.

   Which one of the following identifies the expected system indications for this failure?

   A. #2 seal cavity pressure is 500 psig;
      PUMP B SEAL STAGING FLOW HI/LO annunciator in alarm

   B. #2 seal cavity pressure is 500 psig;
      OUTER SEAL LEAKAGE FLOW DETECTION HI annunciator in alarm

   C. #2 seal cavity pressure is 1000 psig;
      PUMP B SEAL STAGING FLOW HI/LO annunciator in alarm

   D. #2 seal cavity pressure is 1000 psig;
      OUTER SEAL LEAKAGE FLOW DETECTION HI annunciator in alarm

3. Given the following plant conditions on Unit One:

Reactor water level	-25 inches
Reactor pressure	55 psig
Vessel Injection	4500 gpm from RHR

(reference provided)

In accordance with 0OI-37.4, Reactor Vessel Control Procedure Basis Document, which one of the following identifies the current status of Adequate Core Cooling and the operational implications of these conditions?

A. Adequate Core Cooling is met;
Clad temperatures are expected to remain between 1500° F and 1800° F.

B. Adequate Core Cooling is met;
Clad temperatures are expected to remain $\leq$1500° F

C. Adequate Core Cooling is NOT met;
Clad temperatures are expected to exceed 1800° F

D. Adequate Core Cooling is NOT met;
Clad temperatures are expected to remain $\leq$1800° F

4. Which one of the following pumps is powered from 4KV E-Bus E2?

   A. 1A RHR Pump

   B. 2C RHR Pump

   C. 1D RHR SW Booster Pump

   D. 2B RHR SW Booster Pump

5. During accident conditions, suppression pool level has dropped below -6.5 feet.

   Which one of the following identifies the required action for HPCI, including the basis for the action, in accordance with PCCP and 0OI-37.8, Primary Containment Control Procedure Basis Document?

   A. Terminate HPCI irrespective of adequate core cooling to prevent primary containment overpressurization.

   B. Terminate HPCI irrespective of adequate core cooling to prevent exceeding Heat Capacity Temperature Limit.

   C. Maintain HPCI operation if required to maintain adequate core cooling because core cooling takes priority over primary containment integrity.

   D. Maintain HPCI operation if required to maintain adequate core cooling because the turbine exhaust flowrate is within the capacity of containment vent system.

6. Unit Two plant conditions following an automatic initiation of ADS are as follows:

Reactor level	-20 inches
Reactor Pressure	400 psig and lowering
Core Spray pumps	2A and 2B pumps running
ADS SRV's	7 ADS valves OPEN with control switches in AUTO

A dual unit loss of off-site power occurs and all DGs tie onto their respective E buses.

Which one of the following predicts how the ADS valves will respond during the loss of offsite power and subsequent re-energization of power to the E-busses?

A. remain open when the LOOP initially occurs;
remain open after the E-Busses are re-energized.

B. close when the LOOP initially occurs;
remain closed after the E-Busses are re-energized.

C. close when the LOOP initially occurs;
re-open 83 seconds after the Core Spray pumps restart.

D. close when the LOOP initially occurs;
re-open immediately after the Core Spray pumps restart.

7. Following a DBA LOCA on Unit Two, plant conditions are as follows:

Reactor water level	55 inches and rising
Reactor pressure	150 psig
Torus temperature	220° F
Suppression Chamber pressure	10.5 psig
Torus level	-43 inches
2A Core Spray pump flow	5000 gpm
2B Core Spray pump flow	2000 gpm
2A RHR pump flow	8000 gpm
2B RHR pump flow	6000 gpm

(reference provided)

Which one of the following identifies the ECCS pump(s) that is/are operating within the associated NPSH limit(s)?

A. 2B CS Pump ONLY

B. All CS and RHR pumps

C. 2A CS and 2B CS ONLY

D. 2B CS, 2A RHR and 2B RHR ONLY

8. Which one of the following methods is available to determine level in the SLC Tank following a loss of all air systems?

   A. Direct the AO to valve in the local sight glass to obtain the level.

   B. Have the AO read the level gauge on the local instrument rack.

   C. Use the indication on the Level / Power Control ERFIS Screen.

   D. Direct the AO to measure the distance from the surface of the liquid to the top of the SLC Tank.

9. 0PT-01.1.6, Reactor Protection System Manual Scram Test, is in progress. The Reactor Scram System A pushbutton has been depressed.

   Which one of the following choices completes the statement below?

   The alarm(s) that will occur is/are _____.

   The RPS channel(s) that is/are de-energized is/are _____.

   A. REACTOR MANUAL SCRAM SYS A only
      A3 only

   B. REACTOR MANUAL SCRAM SYS A only
      A1, A2 and A3

   C. REACTOR MANUAL SCRAM SYS A and REACTOR AUTO SCRAM SYS A
      A3 only

   D. REACTOR MANUAL SCRAM SYS A and REACTOR AUTO SCRAM SYS A
      A1, A2 and A3

10. Which one of the following identifies the parameter that provides a direct input into the RPS logic (i.e., does not actuate a turbine trip logic first)?

    A. Control Valve Position LVDT

    B. EHC Low Header Discharge Pressure

    C. ETS (Emergency Trip System) Pressure

    D. RETS (Relayed Emergency Trip Supply) Pressure

11. TIP traces are in progress with all TIP drawer Mode Switches in Auto.

    A small steam leak in containment causes drywell pressure to rise to 2.7 psig.

    Which one of the following predicts the final TIP ball valve position indication(s) and also identifies all available location(s) for verifying their position?

    A. Red light indication illuminated on the Back Panel P607 ONLY.

    B. White Valve Light illuminated on each TIP drawer at Back Panel P607 ONLY.

    C. Red light indication illuminated on both the P601 Panel and the Back Panel P607.

    D. Green light indication illuminated on the P601 Panel and a white Valve Light illuminated on each TIP drawer at Back Panel P607.

12. Unit One is commencing a startup with all SRM's fully inserted and reading approximately 1 x 10^5 cps. The IRM's are reading the following:

IRM A	20 on Range 1	IRM E	21 on Range 1
IRM B	28 on Range 1	IRM F	19 on Range 1
IRM C	21 on Range 2	IRM G	23 on Range 2
IRM D	25 on Range 1	IRM H	20 on Range 1

The operator takes the range switch for IRM B from Range 1 to Range 3.

Which one of the following identifies the status of the IRM B downscale white light at P601 and also identifies the annunciator alarm(s) status for this condition?

A. White light illuminated;
ROD OUT BLOCK alarm only.

B. White light illuminated;
Both ROD OUT BLOCK and REACTOR AUTO SCRAM SYS B alarms.

C. White light extinguished;
ROD OUT BLOCK alarm only.

D. White light extinguished;
Both ROD OUT BLOCK and REACTOR AUTO SCRAM SYS B alarms.

13. A reactor startup is in progress following a mid cycle forced outage in accordance with 0GP-02, Approach to Criticality and Pressurization of the Reactor.

The operator notes the following SRM readings:

SRM Channel A	6.0×10^5 cps
SRM Channel B	1.0×10^5 cps
SRM Channel C	7.0×10^4 cps
SRM Channel D	8.0×10^4 cps

All IRMs are on Range 4.

Which one of the following alarms will occur?

A. ROD OUT BLOCK Alarm only

B. SRM UPSCALE / INOP Alarm only

C. SRM UPSCALE / INOP and ROD OUT BLOCK Alarms

D. ROD OUT BLOCK and NEUTRON MON SYS TRIP Alarms

14. Unit Two is operating at 100% rated power.

Which one of the following plant transients will cause the APRM ODA displays to automatically shift to the stability screen?

A. FW-V120, FW Htrs 4 & 5 Byp Vlv, is inadvertantly opened

B. Control Rod drifting into the core

C. "A" Recirculation Pump Trip

D. Inadvertant HPCI injection

15. Unit Two is at rated power when a faulty CST level instrument initiates a false low CST level input to the RCIC logic. RCIC SUCT XFER CST LO LVL annunciator is received.

Which one of the following identifies the correct RCIC system suction valves response?

Suppression Pool Suction Valves, E51-F029 and E51-F031, _____;
CST Suction Valve, E51-F010, _____.

A. immediately auto open;
begins to close when both suppression pool suction valves are not full closed.

B. immediately auto open;
begins to close after both suppression pool suction valves are full open.

C. begin to open when CST suction valve is not full open;
immediately auto closes.

D. begin to open only after the CST suction valve is full closed;
immediatley auto closes.

16. Following a small steam line break in the drywell, plant conditions are as follows:

Drywell Pressure	20.8 psig
Drywell Average Air Temp.	292° F
Torus Pressure	19.0 psig
Reactor Pressure	675 psig
Reactor Water Level	100 inches
HPCI System	Unavailable
RCIC System	Started at LL2 and injecting

Which one of the following identifies the current status of the ADS Initiation Timer and what operator action must be taken in accordance with PCCP?

ADS Initiation Timer _____ started;
Before Drywell Average Air temperature reaches 300° F, _____.

A. has;
Drywell Spray is required

B. has not;
Drywell Spray is required

C. has;
Emergency Depressurization is required

D. has not;
Emergency Depressurization is required

17. Unit Two is operating at full power.

2B RHR and 2B RHR SW pumps have been placed in Suppression Pool Cooling to lower torus temperature.

A subsequent LOCA causes reactor water level to drop rapidly.

Plant conditions are as follows:

Drywell Pressure	18.1 psig
Torus Pressure	13.7 psig
Reactor Pressure	885 psig
Reactor water level	36 inches
E11-F048B	Closed

Which one of the following describes the effect these conditions will have on the status of Suppression Pool Cooling?

A. 2B RHR and 2B RHR SW pumps remain running
E11-F048B will auto open

B. 2B RHR and 2B RHR SW pumps remain running
E11-F048B will remain closed

C. ONLY the 2B RHR SW Pump will trip
E11-F048B will auto open

D. ONLY the 2B RHR SW Pump will trip
E11-F048B will remain closed

18. During an ATWS, circuit alterations are performed per EOP-SEP-10, Circuit Alteration Procedure, to prevent a Group I Isolation from occurring.

    Which one of the following Group I Isolation signals is defeated by this circuit alteration and how is the alteration physically accomplished?

    A. Low Reactor Water Level;
       Installing jumpers

    B. Low Condenser Vacuum;
       Installing jumpers

    C. Low Reactor Water Level;
       Bypass Switch

    D. Low Condenser Vacuum;
       Bypass Switch

19. Unit One is performing 0GP-02, Approach to Criticality and Pressurization of the Reactor, with the following plant conditions:

    MSIVs are open
    Inboard Drain Isolation valve, B21-F016, is open
    Outboard Drain Isolation valve, B21-F019, is open

    Which one of the following identifies the plant response to opening the feeder breaker to 1A RPS MG set?

    A. The AC solenoids on the Inboard MSIVs and the DC solenoids on the Outboard MSIVs de-energize. The B21-F016 closes.

    B. The AC solenoids on the Inboard MSIVs and the DC solenoids on the Outboard MSIVs de-energize. The B21-F019 closes.

    C. The DC solenoids on the Inboard MSIVs and the AC solenoids on the Outboard MSIVs de-energize. The B21-F016 closes.

    D. The DC solenoids on the Inboard MSIVs and the AC solenoids on the Outboard MSIVs de-energize. The B21-F019 closes.

20. On Unit Two, the SRO directs the RO to place drywell sprays in service per 0EOP-01-SEP-02, Drywell Spray Procedure.

    During the execution of SEP-02, SW-V111, Conv SW to Vital Header Vlv, trips on magnetics and remains in the full closed position.

    Which one of the following describes the impact this failure will have on RHR/Drywell Spray system and also identifies the required operator actions in accordance with SEP-02?

    A. loss of cooling water to RHR Room Coolers only;
       Open SW-V117, Nuc SW to Vital Header Vlv.

    B. loss of cooling water to RHR Room Coolers only;
       Open SW-V118, Vital Header Crosstie Vlv.

    C. loss of cooling water to RHR Room Coolers and RHR Pump Seal Coolers;
       Open SW-V117, Nuc SW to Vital Header Vlv.

    D. loss of cooling water to RHR Room Coolers and RHR Pump Seal Coolers;
       Open SW-V118, Vital Header Crosstie Vlv.

21. Following a dual unit Loss Of Offsite Power, which one of the following is the first makeup source to be used for filling the fuel pool in accordance with 0AOP-38.0, Loss of Fuel Pool Cooling?

    A. Demin water header stations

    B. Fire Protection Hose Stations

    C. Condensate transfer pumps

    D. Emergency Diesel Makeup Pump via hoses

22. A reactor scram has occurred with the following plant conditions:

Reactor Pressure	1100 psig
Drywell Pressure	2.5 psig
EHC Pumps	Tripped

Which one of the following systems is available and allowed for use in accordance with RVCP to stabilize pressure below 1050 psig?

A. HPCI

B. RCIC

C. Main Steam Line Drains

D. Main Turbine Bypass Valves

23. Which one of the following describes the effect that a loss of E8 will have on the Unit Two Safety Relief Valve (SRV) system?

A. Inability to manually operate SRV's from the RTGB

B. Inability to manually operate SRV's from the RSDP

C. Loss of SRV position indication on the RTGB

D. Loss of SRV position indication on the RSDP

24. Unit Two is in power ascension following a refueling outage.

    Reactor power is currently 22%.
    The generator has been synchronized with the grid.
    Load Limit is set to 110%
    GP-04, Increasing Turbine Load to Rated Power, directs increasing turbine Load Set to 100%.

    (reference provided)

    If the RO adjusts Turbine Load Set to 90%, which one of the following predicts how the plant will respond as reactor power is raised?

    A. When turbine load exceeds 90%, reactor pressure will increase and cause a reactor scram.

    B. When reactor power reaches 100% then turbine load will be 100%.

    C. When turbine load exceeds 90%, bypass valves will open to control turbine inlet pressure.

    D. When turbine load reaches 90%, bypass valves will open causing a Group I Isolation.

25. With Unit Two operated at rated power, the 2A Feedwater Heater level reaches the Hi Hi Level setpoint due to a failed Feedwater Heater level control valve.

Which one of the following choices completes the statement below?

The Moisture Removal Valves will open to drain the extraction steam lines to the _____ and final feedwater temperature to the reactor will _____.

A. Condenser;
Increase

B. Condenser;
Decrease

C. Heater Drain Deaerator;
Increase

D. Heater Drain Deaerator;
Decrease

26. Reactor pressurization is in progress per 0GP-02, Approach to Criticality and Pressurization of the Reactor.

The feedwater system is aligned as follows:

RFP A is in Service
RFP A Recirc Valve (FW-FV-V46) is open
Reactor Pressure is 400 psig
SULCV (FW-LV-3269) in Auto
Feedwater Heater 4A and 4B inlet isolation valves are closed
FW-FV-177, Feedwater Recirc Valve, throttled open with 0.5 Mlbm/hr.

Which one of the following choices predicts the automatic response of the SULCV and also completes the caution statement in accordance with GP-02?

If the operator throttles FW-FV-177 in the open direction, the SULCV will automatically throttle in the _____ direction. Opening the FW-FV-177 more than the _____ may cause feedwater line depressurization and loss of flow to the reactor vessel.

A. open
RFP A Recirc Valve

B. closed
RFP A Recirc Valve

C. open
SULCV

D. closed
SULCV

27. Unit Two is operating at rated power with the following containment parameters:

Drywell Pressure	0.8 psig
Torus Pressure	1.2 psig

Torus venting is placed in service per 2OP-10, Standby Gas Treatment System Operating Procedure.

Which one of the following identifies the SBGT alignment and also identifies how containment pressure will initially respond as the torus is being vented?

A. Align flow through both SBGT trains;
Drywell Pressure will lower at the same rate as Torus Pressure.

B. Align flow through both SBGT trains;
Drywell Pressure will remain steady.

C. Align flow through one SBGT train only;
Drywell Pressure will lower at the same rate as Torus Pressure.

D. Align flow through one SBGT train only;
Drywell Pressure will remain steady.

28. Unit Two is operating at rated power with UPS in its normal alignment. Subsequently, offsite power is lost. DG3 and DG4 are unavailable. No electrical buses have been cross-tied.

Which one of the following choices completes the statements below?

The UPS Primary Inverter is currently being fed from DC Switchboard _____.
If the Primary Inverter fails, _____.

A. 2A.
UPS loads will be de-energized.

B. 2B.
UPS loads will be de-energized.

C. 2A.
UPS will auto transfer to an alternate source.

D. 2B.
UPS will auto transfer to an alternate source.

29. Unit One is operating at full power with the following plant conditions:

Suppression Pool	96° F due to HPCI Surveillance
RHR	B Loop in SPC (B/D pumps running)
RHR SW	B Loop in service (B/D pumps running)

A Loss of Offsite Power (LOOP) occurs on both Units and DG2 fails to start.

Which one of the following identifies the impact of the LOOP on the 1-E11-F024B and the 1D RHR Pump and also identifies the required action in accordance with 0AOP-36.1, Loss of any 4160V Buses or 480V E-Buses, to support EOP actions?

A. 1-E11-F024B Valve only has lost power.
Crosstie E2 to E4.

B. 1-E11-F024B Valve only has lost power.
Crosstie E1 to E2.

C. 1-E11-F024B Valve and the 1D RHR pump have lost power.
Crosstie E2 to E4.

D. 1-E11-F024B Valve and the 1D RHR pump have lost power.
Crosstie E1 to E2.

30. Unit Two is operating at 30% reactor power when a complete loss of the Vital UPS System occurs.

    Which one of the following describes how this loss will affect RFPT operation?

    A. RTGB trip pushbutton function is lost.

    B. overspeed trip circuit will lose power causing RFPT Trip.

    C. vibration instrumentation will lose power causing RFPT Trip.

    D. RFPT woodward control trip circuits will be powered from their redundant power supplies.

31. Which one of the following choices completes the statements below regarding how a total loss of UPS will affect the Digital Feedwater Level Control System Controllers.

Level Setpoint adjustment is _____.

Level Setdown_____ occur following a reactor scram.

A. available;
will

B. available;
will not

C. not available;
will

D. not available;
will not

32. Which one of the following is the power supply to the Outboard MSIV's DC solenoids on Unit One?

A. Div 1 Switchboard 21A.

B. Div 2 Switchboard 22B.

C. Div 1 Switchboard 1A.

D. Div 2 Switchboard 1B.

33. Unit Two experiences a Loss of Off-Site Power (LOOP) with DG4 under clearance.

Which one of the following predicts the NSW and CSW pump response when the DG3 ties to bus E3?

A. NSW pump 2A and CSW pump 2A start immediately.

B. NSW pump 2A and CSW pump 2A start after a 5 second time delay.

C. NSW pump 2A starts immediately and CSW pump 2A does not start.

D. NSW pump 2A starts after a 5 second time delay and CSW pump 2A does not start.

34. Unit Two is operating at rated power with the A SJAE train in service at Full Load.

A clearance tagging error results in the closure of the SJE-V15, Recombiner Preheater Steam Supply Valve followed by the following alarm:

RECOMBINER INLET TEMPERATURE LOW

Which one of the following describes the effect these conditions will have on Main Condenser vacuum and downstream Hydrogen concentrations?

Main Condenser vacuum will _____.

Hydrogen concentrations will _____.

A. remain steady;
increase

B. remain steady;
decrease

C. degrade;
increase

D. degrade;
decrease

35. Which one of the following identifies the power supplies for the Electric Driven Fire Pump?

    The normal power supply is from:

    A. E2, with an automatic transfer to E4 on loss of power

    B. E4, with an automatic transfer to E2 on loss of power

    C. E2, must be manually transfered to E4 on loss of power

    D. E4, must be manually transfered to E2 on loss of power

36. A plant transient and subsequent safety relief valve malfunction results in reactor steam dome pressure reaching 1300 psig.

Which one of the following choices completes the following statements?

Reactor vessel design pressure _____ been exceeded.

Tech Spec 2.1.2, Reactor Coolant System Pressure Safety Limit _____ been exceeded.

A. has;
has

B. has;
has not

C. has not;
has

D. has not;
has not

37. Unit Two is operating at 19% power with the turbine on the turning gear when the following indications are observed:

SJAE Trains	Both in half load
AOG System Outlet Flow	80 scfm and slowly rising
Condenser Vacuum	Slowly lowering
Steam Seal header pressure	0 psig

Which one of the following identifies the required operator action in acordance with 0AOP-37, Low Condenser Vacuum?

A. Place B SJAE in full load

B. Start the mechanical vacuum pump

C. Throttle open MVD-S2, Steam Seal Bypass Valve

D. Throttle open the SJAE Condensate Recirculation Valve, CO-FV-49

38. A LOCA occurs on Unit One concurrent with a LOOP on both Units.

A DG3 lockout occurs due to a protective relay actuation.

Which one of the following is the response of the Unit One Low Pressure ECCS systems?

There will be injection from _____ of Core Spray.

There will be injection from two RHR pumps in _____.

A. both loops
only one loop

B. only one loop
only one loop

C. both loops
both loops

D. only one loop
both loops

39. Which one of the following is the effect of a loss of the 24 VDC power supply located in RPS Analog Trip Cabinet A1?

A. A1 remains energized from B1

B. A1 remains energizes from A2

C. A1 loses power and trip functions occur

D. A1 loses power and trip functions do not occur

40. Which one of the following identifies the reason that the Turbine Bypass Valves will open following a main turbine trip from full power?

A. Prevent overspeeding of the main turbine during the coastdown.

B. Prevent over pressurization of the MSR cross-over piping.

C. Prevent over pressurization of the reactor vessel.

D. Prevent rupture of the LP Turbine rupture discs.

41. Which one of the following Scram Immediate Operator actions has a different setpoint between Unit One and Unit Two?

A. Tripping of the main turbine.

B. Tripping of the first feed pump.

C. Master level controller setpoint setdown.

D. Placing the reactor mode switch to Shutdown.

42. Unit One was operating at full power when a scram ocurred due to a loss of drywell cooling with the following plant conditions.

Reactor water level	155 inches (slowly lowering)
Drywell pressure	2.1 psig (slowly rising)
High Level Trip A	Amber light extinguished
High Level Trip B	Amber light illuminated
High Level Trip C	Amber light illuminated

Which one of the following is the status of the reactor feed pumps and HPCI system?

The Reactor feed pump turbines:

A. are running and HPCI is injecting to the vessel.

B. are tripped, but HPCI is still injecting to the vessel.

C. are running, but HPCI is tripped.

D. and HPCI are both tripped.

43. Unit One is at rated power when a scram signal is received.

Reactor water level drops and RWCU isolates.

Which one of the following level indicators, if any, was indicating on scale and available for use when RWCU isolated?

A. Fuel Zone (N036/N037) instruments only

B. Wide range (N026A/B) instruments only

C. Both Fuel Zone (N036/N037) and Wide Range (N026A/B) instruments

D. Neither Fuel Zone (N036/N037) nor Wide Range (N026A/B) instruments were available.

44. Unit Two was operating at 100% power when a steam line break caused drywell pressure to rise.

Which one of the following identifies the norrmal temperature relationship between compensated and uncompensated level instrument legs and also identifies the level instruments that will first be affected as drywell temperature rises due to the steam leak?

A. The compensated level instrument legs are at a higher temperature than the uncompensated legs, the compensated level instrument legs will boil first.

B. The uncompensated level instrument legs are at a higher temperature than the compensated legs, the uncompensated level instrument legs will boil first.

C. Both instrument legs are at the same temperature. The compensated level instrument legs will boil first.

D. Both instrument legs are at the same temperature. The uncompensated level instrument legs will boil first.

45. A turbine trip and reactor scram occurs on Unit One. The following indications are on the full core display:

Green Lights Lit	136 rods
Red lights Lit	one rod

Which one of the following choices completes the statements below?

RWM Shutdown Confirmation Screen will display _____.

The reactor _____ remain shutdown under all conditions without boron.

A. Shutdown: NO
will

B. Shutdown: NO
will not

C. Shutdown: YES
will

D. Shutdown: YES
will not

46. While reducing reactor pressure to place Shutdown Cooling in service in accordance with 0AOP-32.0, Plant Shutdown from Outside Control Room, the following reactor pressure readings were recorded at the indicated times:

1200	1000 psig
1300	425 psig
1400	100 psig
1500	25 psig

(reference provided)

Which one of the following choices completes the following statement?

The reactor cooldown rate specified in 0AOP-32.0:

A. has not been exceeded

B. was exceeded between 1200 and 1300

C. was exceeded between 1300 and 1400

D. was exceeded between 1400 and 1500

47. Unit Two is operating at rated power when the TCC-TV-607, MG Set Oil Cooler 2A Temperature Control Valve, fails to the closed position.

Which one of the following describes how this loss of cooling will affect the Recirculation MG Sets?

When the high lube oil temperature in the fluid drive reaches:

A. 190° F the scoop tube will lock and the drive motor breaker remains closed.

B. 190° F the drive motor breaker will trip and the scoop tube will lock.

C. 210° F the scoop tube will lock and the drive motor breaker remains closed.

D. 210° F the drive motor breaker will trip and the scoop tube will lock.

48. Which one of the following identifies the signal(s) that will initiate the Backup Nitrogen System, including the reason for the Backup Nitrogen System?

A. Low Reactor Building Instrument Air header or Core Spray LOCA signal.
Ensures operability of ADS valves and Inboard MSIV's.

B. Core Spray LOCA signal ONLY.
Ensures operability of ADS valves and Inboard MSIV's.

C. Low Reactor Building Instrument Air header or Core Spray LOCA signal.
Ensures operability of ADS valves and the Hardened Wetwell Vent Valves.

D. Core Spray LOCA signal ONLY.
Ensures operability of ADS valves and the Hardened Wetwell Vent Valves.

49. Unit One shutdown is in progress with the following plant conditions:

RWCU is in service.
Recirc Pump B is running.
SDC A Loop has been lost.
Feed and bleed has been established.
Reactor Coolant Temperature is 190° F and lowering slowly.

Given this condition in progress, which one of the following identifies the PREFERRED indication to use to determine vessel metal temperature response in accordance with 1PT-01.7, Heatup/Cooldown Monitoring, including the reason?

A. Bottom head metal temperature;
metal temperature response leads the coolant temperature response during a cooldown.

B. Bottom head metal temperature;
coolant temperature response leads the metal temperature response during a cooldown.

C. Bottom drain coolant temperature;
metal temperature response leads the coolant temperature response during a cooldown.

D. Bottom drain coolant temperature;
coolant temperature response leads the metal temperature response during a cooldown.

50. Which one of the following is the primary containment pressure limit and the required action before this limit is reached in accordance with PCCP?

A. 62 psig
Vent primary containment irrespective of offsite release rate

B. 62 psig
Vent primary containment only if offsite release rate do not exceed ODCM limits

C. 70 psig
Vent primary containment irrespective of offsite release rate

D. 70 psig
Vent primary containment only if offsite release rate do not exceed ODCM limits

51. Unit Two is operating at rated power with EHC Pressure Regulator B out of service.

Pressure Regulator A output fails low.

(Reference provided)

Which one of the following identifies how reactor pressure will respond and also identifies the availability of the bypass valves following the reactor scram?

A. Reactor pressure will decrease and a scram will occur on a Group I Isolation. Bypass valves are not available using the Bypass Valve Jack.

B. Reactor pressure will increase and a scram will occur on high pressure. Bypass valves will still be available using the Bypass Valve Jack.

C. Reactor pressure will decrease and a scram will occur on a Group I Isolation. Bypass valves will still be available using the Bypass Valve Jack.

D. Reactor pressure will increase and a scram will occur on high pressure. Bypass valves are not available using the Bypass Valve Jack.

52. Unit One failed to scram with the following plant conditions:

Reactor Power	3%
RPV Water Level	-55 inches (N036)
RPV Pressure	800 psig
Suppression Pool	115° F

Which one of the following actions, if any, is required to open suppression pool cooling valves (E11-F024 and E11-F028)?

A. Place the Think Switch to Manual only.

B. No overrides are necessary.

C. Place the Think Switch to Manual first and then bypass the 2/3rd core height interlock.

D. Bypass the 2/3rd core height interlock first and then place the Think Switch to Manual.

53. Unit Two is operating at power with a leaking SRV. The ERFIS indication for the Suppression Pool Temperature has just turned RED.

Which one of the following identifies the temperature when ERFIS first turns RED and also identifies which procedure that must be entered?

A. 95° F
PCCP

B. 105° F
PCCP

C. 95° F
0AOP-14.0, Abnormal Primary Containment Conditions

D. 105° F
0AOP-14.0, Abnormal Primary Containment Conditions

54. Conditions on Unit Two have degraded to where the Drywell Air Temperature is 340° F.

Which one of the following identifies the components whose enviromental qualification is affected by this temperature in accordance with 0OI-37.8, Primary Containment Control Procedure Basis Document?

A. Inboard MSIV solenoids

B. SRV solenoids

C. Torus to Drywell Vacuum Breakers

D. CAC 4409 and 4410 Hydrogen Analyzers

55. Which one of the following is the suppression pool level when a manual reactor scram is first required including the required action in accordance with PCCP?

A. -5.5 feet
Anticipation of Emergency Depressurization is required.

B. -5.5 feet
Emergency Depressurization is required

C. -6.5 feet
Anticipation of Emergency Depressurization is required.

D. -6.5 feet
Emergency Depressurization is required

56. During a low reactor water level emergency on Unit One, the Reactor Vessel Control Procedure directs the operator to enter the Steam Cooling Procedure.

Which one of the following describes the reason Steam Cooling Procedure is performed?

The Steam Cooling Procedure utilizes steam cooling heat transfer _____ injection to maximize the time peak clad temperatures in the uncovered portion of the core do not exceed _____°F.

A. with
1500

B. with
1800

C. without
1500

D. without
1800

57. Which one of the following statements identifies the reason SCCP directs emergency depressurization based on temperature in accordance with 0OI-37.9, Secondary Containment Control Procedure Basis Document?

The reason the emergency depressurization is performed due to secondary containment temperature is to:

A. preserve personnel access into the reactor building.

B. ensure ODCM site boundary dose limits are not exceeded.

C. prevent damage to equipment required for safe shutdown.

D. prevent an unmonitored release.

58. During the execution of emergency operating procedures, the operator has restarted Reactor Building HVAC per 0EOP-01-SEP-04, Reactor Building HVAC Restart Procedure.

Which one of the following subsequent conditions would cause the Reactor Building Supply and Exhaust Isolation Dampers to reclose?

A. Reactor water level lowers below LL2.

B. Drywell pressure rises above 1.7 psig.

C. PROCESS OFF-GAS VENT PIPE RAD HI-HI alarm is received.

D. REACTOR BUILDING VENT EXHAUST TEMP HI alarm is received.

59. The unit is in an ATWS with the following conditions:

SLC Tank	30% and lowering
Reactor Water Level	Being maintained 60 to 90 inches
Reactor Power	APRMs downscale

Which one of the following choices completes the statement below in accordance with LPC?

Hot Shutdown Boron Injection Weight _____ been injected and RPV water level _____ required to be raised at this tank level.

A. has
is

B. has
is not

C. has not
is

D. has not
is not

60. Unit Two is operating under accident conditions with the following plant conditions due to a steam leak on HPCI:

Reactor Water Level	-20 inches
Reactor Pressure	900 psig
Injection sources available	HPCI only
Offsite Release	Alert declared
HPCI Room Temperatures	140° F
Suppression Pool Temperature	130° F

Which one of the following identifies the required HPCI operation action in accordance with RRCP and also identifies the reason for taking the action?

A. HPCI should be left running
It is required to be operated by the EOP's

B. HPCI should be isolated
It should have isolated on room high temperature

C. HPCI should be left running
Steam leak detection was overridden per RVCP

D. HPCI should be isolated
To prevent damage to the HPCI pump due to high suppression pool temperatures

61. During normal full power operation of Unit Two the following alarms and indications are noted:

SERVICE AIR PRESS LOW alarm	Sealed In
RB INSTR AIR RECEIVER 2A PRESS LOW	Not in Alarm
RB INSTR AIR RECEIVER 2B PRESS LOW	Not in Alarm
Instrument Air header pressure	100 psig
Service Air header pressure	100 psig

Which one of the following actions is required in accordance with 0AOP-20, Pneumatic System Failures?

A. Start SBGT.

B. Close the manual Noninterruptible Isolation Valves.

C. Close the Service Air isolation valves, PV-706-1 and PV-706-2.

D. Close the Reactor Building Isolation Dampers.

62. Which one of the following identifies the exact location of the RBCCW liquid process radiation detector (D12-RM-K606) and the function(s) it provides?

A. RBCCW pump suction header;
alarm function only

B. RBCCW pump suction header;
alarm and isolation function

C. Upstream of RCC-V28, Drywell Cooling Water Header Isolation Valve;
alarm function only

D. Upstream of RCC-V28, Drywell Cooling Water Header Isolation Valve;
alarm and isolation function

63. The SS has determined that the control room personnel must don SCBAs (Scott AP50) due to smoke in the control room from a plant fire on site.

Which one of the following is an indication that a SCBA is low on air?

A. Air regulator bypass valve fails open.

B. Air regulator bypass valve fails closed.

C. Audible high pitched beep emitting from face piece.

D. Vibralert alarm in the regulator that vibrates the face piece.

64. Generator MVARs are indicating 0 MVARs.

Which one of the following identifies the actions required to restore MVARs to the limits specified in OP-27, Generator and Excitation System Operating Procedure?

Coordinate with the Load Dispatcher to either:

A. Raise the auto voltage regulator or place a capacitor bank in service

B. Lower the auto voltage regulator or place a capacitor bank in service

C. Raise the auto voltage regulator or remove a capacitor bank from service

D. Lower the auto voltage regulator or remove a capacitor bank from service

65. A grid disturbance occurs with the following Unit Two plant parameters:

Generator Load	980 MWe
Generator Reactive Load	160 MVARs, out
Generator Gas Pressure	50 psig

(Reference provided)

Which one of the following identifies all of the available options that will place the Unit within the Estimated Capability Curve?

A. Raise Gas Pressure or lower MWe.

B. Raise Gas Pressure or raise MVARs.

C. Raise Gas Pressure only.

D. Lower MWe only.

66. Which one of the following identifies two activities when two-handed operations are allowed, without prior SCO approval, in accordance 0OI-01.02, Shift Routines and Operating Practices?

A. Continuous rod movement
Inserting a manual scram.

B. Dual purge fan start is desired for primary containment ventilation for personnel entry
Placing RHR in suppression pool cooling.

C. Synchronizing the DG to its bus
Continuous rod movement.

D. Dual purge fan start is desired for primary containment ventilation for personnel entry
Inserting a manual scram.

67. Initial reactor power is at 80%.

Which one of the following identifies two situations that require a PA announcement in accordance with 0AP-50, Site Command, Control, and Communications Procedure, or 0OI-01.02, Shift Routines and Operating Practices?

A. Placing Hydrogen Water Chemistry in service
Fire in the Service Water Building

B. Power reduction to 76%
Fire in the DG2 cell

C. AOP-22, Grid Instability entry
Starting 2B Condensate Pump

D. Power increase to 90%
Opening the Reactor Feed Pump recirc valve

68. While reviewing Display 820, Powerplex Heat Bal/Core Mon Results, the Reactor Operator notes that one of the Feedwater flow values is cyan (blue).

Which one of the following identifies the meaning of this color coding in accordance with 0OI-72, Plant Process Computer System Operating System?

The process parameter:

A. is displaying bad data.

B. is displaying expired data.

C. is exceeding a high alarm limit.

D. has a substitute value inserted.

69. An ATWS has occurred on Unit One with the following plant conditions:

Reactor Water Level	130 inches (stable)
Injection Systems	CRD
Reactor Power	APRM downscale lights are illuminated
Control Rods	19 rods failed to insert
SRVs	All closed
Suppression Pool Temp.	92° F

Which one of the following choices completes the statement below in accordance with LPC?

Reactor Recirculation pumps _____ required to be tripped and the SLC Pumps _____ required to be started.

A. are not
are not

B. are not
are

C. are
are not

D. are
are

70. Given the following alarm criteria:

a trip setpoint that is important to reactor safety, or
a condition requiring prompt action by the operator, or
a condition that requires additional manning at the control panels

Which one of the following identifies the annunciator window designation for this criteria in accordance with 0OI-01.08, Control of Equipment and System Status?

A. Red background with blue bar

B. Red Background with red bar

C. Red Background with yellow bar

D. Amber background with yellow bar

71. Which one of the following identifies the Unit differences for the CREV system control and indications at the RTGB?

A. Unit One has indication and controls
Unit Two has no indication or control

B. Unit One has indication only
Unit Two has indication and controls

C. Unit One has no indication or control
Unit Two has indication and controls

D. Unit One has indication and controls
Unit Two has indication only

72. Considering a 31 day surveillance frequency, which one of the following is last day that the surveillance can be performed and still meet the requirements of Technical Specifications?

The last day the surveillance must be performed by is within _____ of the previous performance of the surveillance.

A. 32 days

B. 38 days

C. 45 days

D. 62 days

73. During performance of 2OI-03.02, Control Operator Daily Surveillance Report, the following SJAE Off-Gas Radiation Monitor readings are recorded:

D12-RM-K601A	110 mr/hr
D12-RM-K601B	50 mr/hr

A local survey instrument positioned at the alternate channel check survey point for SJAE Radiation Monitor B Reads 80 mr/hr.

(reference provided)

Which one of the following characterizes this deviation and also identifies the required action, if any, in accordance with 2OI-03.02.

A. The deviation is conservative
The channel check criteria is met and no other actions are required.

B. The deviation is conservative
Initiate a W/R to evaluate the deviation.

C. The deviation is non-conservative
Declare SJAE Radiation Monitor A inoperable.

D. The deviation is non-conservative
Declare SJAE Radiation Monitor B inoperable.

74. A valve lineup is to be performed in an area that has the following conditions:

Area temperature	115° F
Area radiation	40 mr/hr

Independent verification of this valve lineup is expected to take 0.5 hour.

Which one of the following choices completes the statement below in accordance with OPS-NGGC-1303, Independent Verification?

Independent verification of this lineup, based on the above conditions, may be waived because of _____.

A. both extreme temperature and excessive dose

B. excessive dose only

C. extreme temperature only

D. either extreme temperature or excessive dose

75. Which one of the following requires Health Physics Window notification prior to starting the evolution in accordance with 1OP-14.0, Reactor Water Cleanup System Operating Procedure?

A. RWCU Reject Operation For Vessel Chemistry to radwaste

B. Precoat of a RWCU filter

C. Backwash of a RWCU filter only

D. Transfer of the Backwash Receiving Tank to radwaste only

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Name: _____ Date: _____

1.	A	B	C	D	26.	A	B	C	D	51.	A	B	C	D
2.	A	B	C	D	27.	A	B	C	D	52.	A	B	C	D
3.	A	B	C	D	28.	A	B	C	D	53.	A	B	C	D
4.	A	B	C	D	29.	A	B	C	D	54.	A	B	C	D
5.	A	B	C	D	30.	A	B	C	D	55.	A	B	C	D
6.	A	B	C	D	31.	A	B	C	D	56.	A	B	C	D
7.	A	B	C	D	32.	A	B	C	D	57.	A	B	C	D
8.	A	B	C	D	33.	A	B	C	D	58.	A	B	C	D
9.	A	B	C	D	34.	A	B	C	D	59.	A	B	C	D
10.	A	B	C	D	35.	A	B	C	D	60.	A	B	C	D
11.	A	B	C	D	36.	A	B	C	D	61.	A	B	C	D
12.	A	B	C	D	37.	A	B	C	D	62.	A	B	C	D
13.	A	B	C	D	38.	A	B	C	D	63.	A	B	C	D
14.	A	B	C	D	39.	A	B	C	D	64.	A	B	C	D
15.	A	B	C	D	40.	A	B	C	D	65.	A	B	C	D
16.	A	B	C	D	41.	A	B	C	D	66.	A	B	C	D
17.	A	B	C	D	42.	A	B	C	D	67.	A	B	C	D
18.	A	B	C	D	43.	A	B	C	D	68.	A	B	C	D
19.	A	B	C	D	44.	A	B	C	D	69.	A	B	C	D
20.	A	B	C	D	45.	A	B	C	D	70.	A	B	C	D
21.	A	B	C	D	46.	A	B	C	D	71.	A	B	C	D
22.	A	B	C	D	47.	A	B	C	D	72.	A	B	C	D
23.	A	B	C	D	48.	A	B	C	D	73.	A	B	C	D
24.	A	B	C	D	49.	A	B	C	D	74.	A	B	C	D
25.	A	B	C	D	50.	A	B	C	D	75.	A	B	C	D