U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit: Watts Bar Nuclear Plant
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

1. Given the following plant conditions:

   - A reactor trip occurs on Unit 1.
   - Off-Site power is lost.
   - The crew enters ES-0.1, "Reactor Trip Response."

   Upon entering ES-0.1, Step 3 directs the operators to monitor for RCS temperature trending to 557°F.

   Which ONE of the following identifies the temperature indication the operators will use for monitoring and why?

   A. Tcold, to check for natural circulation established.

   B. Tcold, to ensure RCS heat removal is controlled.

   C. Tavg, to check for natural circulation established.

   D. Tavg, to ensure RCS heat removal is controlled.

2. Consider the following Unit 1 conditions:

   - A safety injection has occurred.
   - RCS pressure is 1720 psig and still dropping.
   - Pressurizer level initially dropped and is now rising.
   - All reactor coolant pumps are in operation.

   Which one of the following identifies the leak location?

   A. Pressurizer safety valve

   B. Reactor Vessel Head vent line

   C. Cold Leg Accumulator #1 check valve weld

   D. Loop 2 Hot Leg temperature instrument well

3. Given the following plant conditions:

   - Unit 1 is at 100% power.
   - The following equipment is out of service and tagged.
     - CCP Pump 1A-A
     - Thermal Barrier Booster Pump 1A
   - A LOCA occurs
     - RCS pressure stabilized at 1605 psig.
     - Containment pressure has increased to 1.6 psig and slowly rising.
     - E-1, "Loss of Reactor or Secondary Coolant," is in progress.

   Which ONE of the following identifies a condition that would require the RCPs to be removed from service?

   A. Thermal Barrier Booster Pump 1B trips.

   B. Containment Pressure increases to 2.1 psig.

   C. BIT flow is verified.

   D. RCS pressure drops to 1480 psig.

4. Unit 1 is operating at 100% power with CSST 'C' out of service:

   - A LOCA occurs and the RCS pressure is currently at 250 psig and dropping.

   Which ONE of the following identifies the status of the RHR pumps?

   A. Both RHR pumps are currently injecting.

   B. Only RHR pump 1B-B is currently injecting.

   C. Only RHR pump 1A-A is currently injecting.

   D. Neither RHR pump is currently injecting.

5. Given the following:

   - The Unit is at 100% power with 1-FCV-62-73, Letdown Orifice Valve B, in service.
   - The running charging pump trips.

   Which ONE of the following identifies how the CVCS letdown valves are closed?

   Note:
   1-FCV-62-69 and 1-FCV-62-70 - RCS Letdown from Loop 3 in CNTMT

   A. Manually close 1-FCV-62-69 and 1-FCV-62-70 which will allow 1-FCV-62-73 to be closed manually.

   B. Manually close 1-FCV-62-69 and 1-FCV-62-70 which will allow 1-FCV-62-73 to close automatically.

   C. Manually close 1-FCV-62-73 which will allow 1-FCV-62-69 and 1-FCV-62-70 to be closed manually.

   D. Manually close 1-FCV-62-73 which will allow 1-FCV-62-69 and 1-FCV-62-70 to close automatically.

6. Given the following plant conditions:

- The reactor was shutdown 3 weeks ago for a forced outage.
- The RCS has been drained to elevation 719' to support maintenance.
- 2 S/G Hot Leg Manways have been removed.
- No nozzle dams are installed.
- RCS temperature is 140°F.
- A non-recoverable loss of RHR cooling has occurred.
- The operating crew has implemented AOI-14, "Loss of RHR Cooling."

Which ONE of the following identifies...

(1) the approximate amount of time for core boiling to begin

and

(2) the 'feed and bleed' method that would be used in accordance with AOI-14?

REFERENCE PROVIDED

A. (1) 13 minutes
(2) Gravity feed to the RCS

B. (1) 13 minutes
(2) Normal Charging to the RCS

C. (1) 16 minutes
(2) Gravity feed to the RCS

D. (1) 16 minutes
(1) Normal Charging to the RCS

7. Unit 1 is operating at 100% power with the following conditions:

   - 1-SI-99-10-B, "62 Day Functional Test of SSPS Train B and Reactor Trip Breaker B," is in progress.
   - Reactor Trip Breaker (RTB) B is currently open with its bypass breaker BYB closed.
   - The Reactor Trip Breaker A (RTA) 125v DC control power supply breaker on 125v DC Battery Board 1 trips open.
   - A turbine trip occurs but the reactor fails to automatically trip due to failure of SSPS Train A.

   Which ONE of the following identifies...

   (1) how the reactor will respond to placing the Reactor Trip Switches on 1-M-4 and 1-M-6 to the TRIP position

   and

   (2) the indications available on RTA and BYB indicating lights after the reactor is manually tripped?

   A. (1) The reactor would trip from actuation of either of the reactor trip switches.
      (2) Neither RTA or BYB would have an indicating light lit.

   B. (1) The reactor would trip from actuation of either of the reactor trip switches.
      (2) BYB would have the GREEN indicating light lit but RTA will **NOT** have an indicating light lit.

   C. (1) The reactor would trip from actuation of the reactor trip switch on 1-M-6 only
      (2) Neither RTA or BYB would have indicating light lit.

   D. (1) The reactor would trip from actuation of the reactor trip switch on 1-M-6 only.
      (2) BYB would have the GREEN indicating light lit but RTA will **NOT** have an indicating light lit.

8. Given the following:

- A steam generator tube rupture has occurred on S/G #4 .
- Both manual reactor trip and safety injection signals have been initiated.
- A coincidental loss of support systems has caused the RCPs to be stopped.
- The crew has implemented E-3, "Steam Generator Tube Rupture," and is currently cooling down to the target core exit temperature.

Which ONE of the following identifies...

(1) the flow rate through the RCS Loop 4 relative to flow rate through the intact RCS Loops

and

(2) why a Pressurized Thermal Shock (PTS) RED path could be reached based on Tcold in the ruptured loop?

	(1)	(2)
A.	lower than	because of the reverse flow in the loop
B.	lower than	because of the ECCS flow being injected
C.	the same as	because of the reverse flow in the loop
D.	the same as	because of the ECCS flow being injected

9. Plant conditions are as follows:

   - A reactor startup is in progress following a five week Refueling Outage.
   - MTC is at the maximum value allowed by Technical Specifications without requiring Rod Withdrawal Limits to be established.
   - The reactor is critical with:
     - NI-135 - $1x10^{-2}$% power and stable.
     - NI-136 - $1x10^{-2}$% power and stable.

   - Subsequently, a steam line break of 3% of rated steam flow occurs.

   Assuming no operator actions, which ONE of the following describes the response of the reactor?

   A. The reactor will go subcritical.

   B. The reactor will remain at the current power level.

   C. Reactor power will stabilize at the Point of Adding Heat.

   D. Reactor power will rise and stabilize at approximately 3% power.

10. Given the following plant conditions:

    - Unit 1 was operating at 100% power when the 1B MFP tripped.
    - The operating crew stabilized the unit in accordance with AOI-16, "Loss of Normal Feedwater."
    - The plant responded as expected and all AOI-16 actions have been completed, with the exception of repairing the 1B MFP.

    Later in the shift, 6.9kV Unit Board 1D trips and locks out.

    Which ONE of the following identifies the required action to be taken as a result of the loss of the unit board?

    A. If turbine load is greater than 900 MWe, then reduce turbine load to 900 MWe by lowering the EHC Reference Control, in accordance with AOI-37, "Turbine Runback Response."

    B. If turbine load is 800 MWe or greater, then reduce turbine load to within MFWP capability by lowering the EHC Reference Control, in accordance with AOI-16.

    C. If turbine load is greater than 900 MWe, then reduce turbine load to 900 MWe with the Valve Position Limiter, in accordance with AOI-37, "Turbine Runback Response."

    D. If turbine load is 800 MWe or greater, then reduce turbine load to within MFWP capability with the Valve Position Limiter in accordance with AOI-16.

11. Which ONE of the following is a purpose of depressurizing all intact steam generators (S/Gs) to 300 psig during the performance of ECA-0.0, "Loss of Shutdown Power?"

    A. Reduces differential pressure across S/G U-tubes to minimize RCS inventory loss in the event of a tube rupture.

    B. Reduces differential pressure across RCP seals to minimize leakage and loss of RCS inventory.

    C. Maximizes natural circulation flow before reflux cooling begins as the RCS becomes saturated.

    D. Maximizes natural circulation flow to allow reactor vessel head to cool since CRDM cooling fans are unavailable.

12. Given the following:

- Unit 1 is operating at 14% power.
- The loss of a 120v AC vital Instrument Power Board results in the operators initiating action to decrease reactor power to within the capability of the AFW system.
- During the power decrease the OAC manually trips the reactor using handswitch 1-RT-1, Reactor Trip, after an automatic trip signal failed.

A loss of which ONE of the following 120v AC Vital Instrument Power Boards required the reactor power decrease to within AFW capability and how many Immediate Operator Actions (IOAs) would be required by the first Emergency Operating Procedure performed in responding to the event?

	BOARD	IOAs
A.	1-II	2
B.	1-II	4
C.	1-IV	2
D.	1-IV	4

13. Given the following:

- During performance of Operator Rounds, the Control Building AUO reports 125V Vital Battery Board I voltage is reading 127 volts and has dropped since the beginning of the shift.

Which ONE of the following identifies ...

(1) the current status of the battery board relative to the board voltage,

and

(2) the spare charger that can be aligned to supply the 125V Vital Battery Board I?

	Status	Spare Charger
A.	Operable	125V Vital Battery Charger 6-S
B.	Operable	125V Vital Battery Charger 7-S
C.	Inoperable	125V Vital Battery Charger 6-S
D.	Inoperable	125V Vital Battery Charger 7-S

14. With Unit 1 operating at 100% power the following occurs:

- ERCW supply header 1A ruptures in the yard.
- AOI-13, "Loss of Essential Raw Cooling Water," is implemented to isolate the leak.

When the appropriate section of the AOI is complete, which ONE of the following identifies...

(1) the ERCW supply header that will be supplying water to Auxiliary Building components that are supplied from the 1A Supply Header

and

(2) how the cooling on the A Train diesel generators (DGs) is affected?

A. (1) ERCW Supply Header 2A
(2) Only DG 1A-A will be supplied from its alternate supply

B. (1) ERCW Supply Header 2A
(2) Both DG 1A-A and 2A-A will be supplied from their alternate supplies.

C. (1) ERCW Supply Header 2B
(2) Only DG 1A-A will be supplied from its alternate supply

D. (1) ERCW Supply Header 2B
(2) Both DG 1A-A and 2A-A will be supplied from their alternate supplies

15. Given the following plant conditions:

- With Unit 1 operating at 100% power, control air pressure begins to drop.

Which ONE of the following identifies...

(1) the reason 1-FCV-32-80, "AUX AIR TO RX BLDG TR A" will automatically isolate as the air pressure decreases

and

(2) the component that will be unable to be operated following the isolation?

A. (1) To maintain Aux Air pressure and to prevent containment overpressure.
(2) 1-PCV-68-340B, Loop 2 Pressurizer Spray valve

B. (1) To maintain Aux Air pressure and to prevent containment overpressure.
(2) 1-PCV-68-340D, Loop 1 Pressurizer Spray valve

C. (1) To ensure containment is isolated in the event of an air line break outside containment
(2) 1-PCV-68-340B, Loop 2 Pressurizer Spray valve

D. (1) To ensure containment is isolated in the event of an air line break outside containment
(2) 1-PCV-68-340D, Loop 1 Pressurizer Spray valve

16. Given the following plant conditions:

- Reactor Trip and Safety Injection have occurred on Unit 1.
- The crew has transitioned to ECA-1.2, "LOCA Outside Containment."
- The leak has NOT been identified and the crew is preparing to isolate Cold Leg Injection.

Which ONE of the following identifies how Cold Leg Injection is isolated, and how to determine if the leak has been stopped in accordance with ECA-1.2?

1-FCV-63-93 and FCV-63-94, Cold Leg Injection Valves are closed ____(1)____ and the leak isolation is verified by ____(2)____ response.

	(1)	(2)
A.	simultaneously	pressurizer level
B.	simultaneously	RCS pressure
C.	one at a time	pressurizer level
D.	one at a time	RCS pressure

17. Given the following:

- A reactor trip occurred on Unit 1 and no AFW supply could be established due to equipment failures.
- A transition to FR-H.1 "Loss of Secondary Heat Sink," was required.
- The crew is establishing Main Feedwater flow using the Standby Main Feed Pump.

Which one of the following identifies the condensate pumps that would be in service to support the supply of feedwater using the Standby Main Feed Pump in accordance with FR-H.1?

A. Hotwell pumps, only

B. Hotwell pumps and Cond Demin Booster pumps, only

C. Hotwell pumps and Condensate Booster pumps, only

D. Hotwell pumps, Cond Demin Booster pumps, and Condensate Booster pumps

18. Given the following conditions:

- With Unit 1 initially operating at full power a large break LOCA occurred.
- Containment pressure peaked at 7.3 psig and is currently 3.2 psig and slowly dropping.
- Neither RHR pump could be started.
- Both Containment Spray Pumps are running.
- RWST level = 66%.
- Containment sump level = 24%.
- The crew has transitioned to ECA-1.1, "Loss of RHR Sump Recirculation," and is at the table in Step 4 to determine the proper containment spray pump alignment and operation.

Which ONE of the following will result in the proper alignment of the containment spray pumps under existing plant conditions?

A. Stop and 'Pull To Lock' both Containment Spray Pumps and close their discharge valves.

B. Stop both Containment Spray Pumps and close their discharge valves, align suction to the containment sump and place their handswitches in A-AUTO.

C. Stop and 'Pull To Lock' one Containment Spray Pump, close its discharge valve. Allow the remaining containment spray pump to continue to run taking suction from the RWST.

D. Continue to run both containment spray pumps until RWST level is less than or equal to 8%, then stop and 'Pull To Lock' both containment spray pumps and close their discharge valves.

19. Which ONE of the following identifies...

(1) a condition that requires entry into the Emergency Operating Procedure network

and

(2) the Immediate Operator Actions required upon entry?

A. (1) Shutdown Bank A control rod D2 drops while Unit 1 is operating at 100% power.
(2) Ensure Reactor and Turbine are tripped, only.

B. (1) Shutdown Bank A control rod D2 drops while Unit 1 is operating at 100% power.
(2) Ensure Reactor and Turbine are tripped, at least one 6.9Kv shutdown board is energized, and determine if a Safety Injection is required.

C. (1) Shutdown Bank A control rods D2 and B12 drop while Unit 1 is operating at 30% power.
(2) Ensure Reactor and Turbine are tripped, only.

D. (1) Shutdown Bank A control rods D2 and B12 drop while Unit 1 is operating at 30% power.
(2) Ensure Reactor and Turbine are tripped, at least one 6.9Kv shutdown board is energized, and determine if a Safety Injection is required.

20. Given the following:

- Unit 1 trips from 100% power.
- Shutdown Bank A rod M2 sticks at its fully withdrawn position.
- Control Bank C rod K10 sticks at 70 steps withdrawn.
- All other Shutdown and Control rods are completely inserted.

Which ONE of the following identifies how the shutdown margin calculation (SDM) to verify adequate boron concentration to meet the SDM requirement is affected during the performance of 1-SI-0-10, "Shutdown Margin," hand calculations?

A. The stuck rods do not affect the way the SDM is calculated after the trip because after the trip the calculation is done using refueling boron concentration which has enough conservatism to account for the Maximum Stuck Rod Worth.

B. Because the Maximum Stuck Rod Worth is already included in the SDM calculation, the worth of rod M2 does not affect the SDM calculation but the actual worth of rod K10 being stuck at 70 steps withdrawn is required to be determined and included in the calculation.

C. The Maximum Stuck Rod Worth is required to be multiplied by two because there are two rods that are stuck during the performance of the SDM calculation.

D. Because the Maximum Stuck Rod Worth is already included in the SDM calculation, the worth of rod M2 does not affect the SDM calculation but due to rod K10 being stuck at 70 steps withdrawn, a 600 pcm reduction is required in the SDM calculation.

21. Which ONE of the following identifies...

(1) the 120v AC Vital Power supply to Source Range Monitor NI-132

and

(2) the 1-M-13 switch that would be repositioned to restore a loss audible count rate signal inside containment while the plant was in Mode 6 with both SRMs indicating 20 CPS in accordance with AOI-4, "Nuclear Instrumentation Malfunctions,"?

	Power Supply	1-M-13 switch
A.	120v AC Vital Board 1-II	'AMPLIFIER SELECT'
B.	120v AC Vital Board 1-II	'CHANNEL SELECTOR'
C.	120v AC Vital Board 1-IV	'AMPLIFIER SELECT'
D.	120v AC Vital Board 1-IV	'CHANNEL SELECTOR'

22. Given the following:

    - Unit 1 is at 30% power when Intermediate Range Monitor NI-135 fails due to one blown fuse.

    Which ONE of the following NI-135 drawer indications identifies a condition where the IR high flux reactor trip signal could **NOT** be manually bypassed using the Level Trip Switch and list the Tech Spec LCO(s) that would be currently applicable due to the blown fuse?

    Note:
    LCO 3.3.1, Reactor Trip System (RTS) Instrumentation
    LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation

    A. Control Power light is DARK;
    LCO 3.3.3, only

    B. Control Power light is DARK;
    LCO 3.3.1 and LCO 3.3.3

    C. Instrument Power light is DARK;
    LCO 3.3.3, only

    D. Instrument Power light is DARK;
    LCO 3.3.1 and LCO 3.3.3

23. Unit 1 is in a refueling outage with core reload in progress, when the following occurs:

    0905 - The Main Control Room is notified of an alarm sounding in the Incore Instrument Room.
    0907 - An AUO and RADPRO are dispatched to the room.
    0912 - Annunciator window 128-A, "SFP LEVEL HI/LO" alarms.
    0915 - Annunciator window 174-A, "1-RR-90-1 AREA RAD HI" alarms.
    0915 - CRO reports:
    1-RM-90-59, UPPER CONTAINMENT, count rate rising.
    All other Rad monitors with input to window 174-A are normal.

    Which ONE of the following events would cause the above conditions and the required location of the fuel transfer cart prior to initiating closure of 1-ISV-78-600, Fuel Transfer Tube Isolation?

    A. Leakage on the Reactor Cavity Seal;
    Reactor side

    B. Leakage on the Reactor Cavity Seal;
    Spent Fuel Pit side

    C. RCS leak on an Incore Detector 5 path transfer device;
    Reactor side

    D. RCS leak on an Incore Detector 5 path transfer device;
    Spent Fuel Pit side

24. Given the following:

- Unit 1 is operating at 100% power when a small SGTL is determined to exist.
- AOI-33, "Steam Generator Tube Leak," is entered and Appendix A, "Steam Generator Tube Leak Monitoring," is being implemented.
- CRO reports the following radiation monitors rising concurrently:
  1-RM-90-106, Lower Containment Rad Monitor
  1-RM-90-119, Condenser Vacuum Pump Exhaust
  1-RM-90-120/121, Steam Generator Blowdown

Which ONE of the following identifies...

(1) a condition resulting in the increased radiation indications

and

(2) the action required in response to the indications in accordance with AOI-33?

A. (1) Developing fuel defect
   (2) Recalculate threshold value for 1-RM-90-119.

B. (1) Developing fuel defect
   (2) Use 1-RM-90-120/121 to quantify SGTL.

C. (1) Increased SG tube leakage
   (2) Recalculate threshold value for 1-RM-90-119.

D. (1) Increased SG tube leakage
   (2) Use 1-RM-90-120/121 to quantify SGTL.

25. Unit 1 is operating at 100% power when the following occurs:

    - Annunciator Window 174-B, "1-RR-90-1 AREA RAD HI" alarms.

    Which ONE of the following identifies...

    (1) the location(s) where a rate meter is located that will indicate the radiation level being sensed by the Area Radiation Monitor (ARM) causing the alarm

    and

    (2) what type alarm(s) is/are available locally at the ARM?

    A. (1) In the Main Control Room, only;
       (2) An audible alarm, only

    B. (1) In the Main Control Room, only;
       (2) Both an audible alarm and an indicating light

    C. (1) Both in the Main Control Room and locally at the monitor;
       (2) An audible alarm, only

    D. (1) Both in the Main Control Room and locally at the monitor;
       (2) Both an audible alarm and an indicating light

26. Which ONE of the following identifies how the operation of the CVCS Cation Bed is addressed when implementing AOI-28, "High Activity in the Reactor Coolant" and the maximum flow rate allowed through the bed?

Cation Bed Operation	Flow Rate
A. Required to be placed in service	75 gpm.
B. Required to be placed in service	120 gpm
C. Placed in service only if Chemistry directs	75 gpm
D. Placed in service only if Chemistry directs	120 gpm

27. Unit 1 was operating at 100% power when the following occurred:

- Operators initiated a Reactor Trip and Safety Injection due to flow past a S/G #2 safety valve.
- Actions were taken in accordance with the emergency instructions and the crew is now performing ES-1.1, "SI Termination."
- After the first CCP has been stopped, the BIT isolated, and normal Charging established, the crew is waiting for the faulted S/G to depressurize before proceeding.

Which ONE of the following identifies the reason for delaying the performance of subsequent steps?

A. Because the RCS cooldown may result in requiring the use of FR-P.1, "Pressurized Thermal Shock," which has less restrictive SI termination criteria.

B. Because if the S/G pressure stabilizes greater than 0 psig, it is indicative of a S/G tube rupture requiring use of ECA-3.1, "SGTR and LOCA - Subcooled Recovery."

C. Because the determination of further reductions of ECCS injection flow cannot be accurately evaluated while the faulted S/G continues to depressurize.

D. Because the final S/G pressure is used to determine the maximum RCS pressure allowed to prevent exceeding the 1600 psid ΔP limit across the S/G tubes.

28. Given the following plant conditions:

- The Unit is at 40% power.
- RCP #1 trips.

Assuming no operator action, which ONE of the following identifies the immediate effect the RCP trip will have on indicated steam generator #1 pressure and level?

	SG #1 Pressure	SGs #1 Level
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

29. Given the following plant conditions:

- RCS heat-up in progress.
- The Shift Manager has directed the crew to start the first RCP.

Which ONE of the following sets of parameters identifies conditions that will allow start of the RCP in accordance with SOI-68.02, "Reactor Coolant Pumps?"

	RCS Pressure (psig)	Seal Inj. Flow (gpm)	VCT Pressure (psig)
A.	312	9	35
B.	331	12	19
C.	349	11	13
D.	372	7	25

30. Given the following:

- Unit is operating at 100%.
- Pressure transmitter 1-PT-62-81 fails high.

Which ONE of the choices completes the statement below?

1-PCV-62-81, Letdown Pressure Control Valve, will go full _____ causing _____ .

A. open;
the letdown relief valve to the PRT to open

B. open;
flashing to occur in the letdown line

C. closed;
the letdown relief valve to the PRT to open

D. closed;
flashing to occur in the letdown line

31. Given the following:

- Unit 1 is being cooled down for a refueling outage.
- Due to the computer program being unavailable, manual performance of 1-SI-68-44, "RCS Temperature/Pressure Limits and Pressurizer Temperature Limits," is required.
- RHR Train A has been placed in service in accordance with SOI-74.01, Residual Heat Removal System."

Which ONE of the following identifies the temperature that will be recorded to ensure compliance with the RCS cooldown limits if the RCPs are required to be stopped and the primary operational concern if the limits are violated?

A. RHR temperature on the Train A RHR heat exchanger inlet.
Making an existing vessel beltline crack more susceptible to a brittle failure.

B. RHR temperature on the Train A RHR heat exchanger inlet.
Creating a higher potential to develop a new crack in the reactor vessel head.

C. RCS Tcold temperature on the coolest RCS loop.
Making an existing vessel beltline crack more susceptible to a brittle failure.

D. RCS Tcold temperature on the coolest RCS loop.
Creating a higher potential to develop a new crack in the reactor vessel head.

32. Given the following conditions:

- Unit 1 is in Mode 4 with Train A RHR in service.

Which ONE of the choices below completes the following statement?

If the offsite power supply to the __(1)__ is inadvertently opened at the Watts Bar Hydro Station, the RHR Pump 1A-A breaker will trip open and after the DG re-energizes the shutdown board, the RHR pump __(2)__ be sequenced back on after a time delay.

	(1)	(2)
A.	CSST 'D'	will
B.	CSST 'D'	will **NOT**
C.	CSST 'C'	will
D.	CSST 'C'	will **NOT**

33. Given the following:

- Unit 1 has experienced a Design Basis LOCA.
- 1-FI-63-91B, RHR TO CL 2 & 3 WR FLOW, indicate 2700 gpm.
- 1-FI-63-92B, RHR TO CL 1 & 4 WR FLOW, indicate 3250 gpm.
- RWST Level is 57% on all 4 level indicators.
- Containment Sump level is 50% on all 4 level indicators.

If RHR pump 1A-A trips, which ONE of the following identifies how the RHR flow indication(s) will be affected?

A. 1-FI-63-91B will drop, 1-FI-63-92B will remain the same

B. 1-FI-63-92B will drop, 1-FI-63-91B will remain the same

C. Both 1-FI-63-91B and 1-FI-63-92B will drop

D. 1-FI-63-92B will drop, 1-FI-63-91B will rise

34. Which ONE of the following completes the statement below relative to the operation of the Reactor Coolant Drain Tank (RCDT) pumps?

When 1-FCV-68-310, PRT Drain to RCDT is opened, the ___(1)___ will auto-start and if the RCDT level drops to the low level setpoint while the PRT is being drained, the pump will ___(2)___ .

	(1)	(2)
A.	RCDT Pump A	continue to run
B.	RCDT Pump B	continue to run
C.	RCDT Pump A	auto-stop
D.	RCDT Pump B	auto-stop

35. Given the following:

- Unit 1 is operating at 100% power with a known 3 gpm leak on CCS pump 1A-A discharge:
- Unit 1 CCS surge tank level is indicating 68% on both the A and the B sides of the tank.
- The control air header in the Auxiliary Building rapidly depressurized due to a large leak and the header is isolated.

Which ONE of the following identifies the impact of the loss of air to 1-LCV-70-63, U1 SURGE TANK MAKEUP LCV and action to control/mitigate the event?

The surge tank level would...

A. rise resulting in CCS water being spilled out the surge tank vent valve until the LCV is closed or isolated.

B. rise resulting in the automatic closing of the surge tank vent to prevent loss of water from the system until the LCV is closed or isolated.

C. continue to drop on the 'A' side of the tank with level on the 'B' side remaining at 68% until a gas bottle is installed to allow opening of the valve.

D. continue to drop to less than 68% on both sides of the tank until a gas bottle is installed to allow opening of the valve.

36. Given the following:

- Unit is in Mode 5 with RCS temperature at 140°F following completion of a refueling outage.
- CCS Heat Exchanger C is isolated and drained.
- CCS pump C-S is tagged.
- RCS heatup is initiated.

Which ONE of the following completes the statements below?

(1) The CCS Heat Exchanger C is required to be restored to service before the RCS temperature exceeds ____(1)____ .

(2) When the CCS Train is required to be restored, ____(2)____ will meet Tech Spec operability requirements.

	(1)	(2)
A.	200°F	only CCS pump 1B-B
B.	200°F	either CCS pump 1B-B or 2B-B
C.	350°F	only CCS pump 1B-B
D.	350°F	either CCS pump 1B-B or 2B-B

37. Given the following:

- Unit 1 is operating at 100% power.
- 1-FCV-68-333, BLOCK VLV FOR PORV 340A, stroke time testing in accordance with1-SI-68-901-A, "Valve Full Stroke Exercising During Plant Operation: Reactor Coolant A-Train," is in progress.
- 1-FCV-68-333 has been stroked closed and the procedure now directs the valve to be reopened.

Which ONE of the following identifies...

(1) the Block valve required stroke time acceptance criteria that must be met in accordance with 1-SI-68-901-A

and

(2) a condition that has the potential to cause the Pressurizer Relief Tank (PRT) pressure and temperature to rise when the Block valve was being open?

A. (1) Valve opening time
(2) Pressure between the PORV 340A and the block valve increased rapidly.

B. (1) Valve opening time
(2) PORV 340A handswitch remained in AUTO while the block valve was opening.

C. (1) Valve closing time
(2) Pressure between the PORV 340A and the block valve increased rapidly.

D. (1) Valve closing time
(2) PORV 340A handswitch remained in AUTO while the block valve was opening.

38. Given the following plant information:

- The unit was at 20% RTP when a Safety Injection occurred due to an inadvertent 'High Containment Pressure' signal.
- The crew is currently performing SI Termination.

Which ONE of the following identifies...

(1) the reactor trip coils which operated

and

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(2) the status of Permissive window ~~87~~ 70-B, AUTO SI BLOCKED, after the SI is reset using the SI Reset Pushbuttons on 1-M-6?

A. (1) UV and shunt trip coils
(2) LIT

B. (1) UV and shunt trip coils
(2) **NOT** LIT

C. (1) UV coil, only
(2) LIT

D. (1) UV coil, only
(2) **NOT** LIT

39. Given the following:

- Unit 1 was operating at 100% when a small steam leak inside containment occurred.
- Due to containment pressure rising, the reactor was tripped.
- After the reactor was manually tripped, no AFW flow could be established resulting in the implementation of FR-H.1, "Loss of Secondary Heat Sink."
- After entering FR-H.1, a Safety Injection occurred due to containment pressure which is now 1.7 psig and stable.
- The Crew has placed all four SI Block Switches on 1-M-4 to BLOCK and the Safety Injection signal has been reset using the SI RESET pushbuttons on 1-M-6.
- The crew is currently attempting to restore main feedwater.

Which ONE of the following identifies the mitigation strategy required to allow the Feedwater Isolation (FWI) signal to be reset?

A. Auto SI must be blocked using IMI-99.040, "Auto SI Block," then the reactor trip breakers must be cycled before the FWI signal can be reset.

B. The FWI signal can be reset without blocking Auto SI using IMI-99.040, "Auto SI Block," or cycling the reactor trip breakers.

C. Auto SI must be blocked using IMI-99.040, "Auto SI Block," but the reactor trip breakers do **NOT** have to be cycled before the FWI signal can be reset.

D. The FWI signal can be reset without blocking Auto SI using IMI-99.040, "Auto SI Block," but the reactor trip breakers must be cycled before the FWI signal can be reset.

40. Given the following:

    - Unit 1 is in Mode 3.

    Which ONE of the following identifies Containment Ventilation equipment that when removed from service and tagged for maintenance, places the Unit in a condition that requires the equipment to be returned to service within a specified time unless the unit is placed in Mode 5 in accordance with the Technical Specifications or Technical Requirements Manual?

    A. Lower Compartment Cooler or Containment Air Return Fan

    B. Lower Compartment Cooler or Control Rod Drive Motor Cooler

    C. Reactor Coolant Pump Motor Cooler or Containment Air Return Fan

    D. Reactor Coolant Pump Motor Cooler or Control Rod Drive Motor Cooler

41. Given the following:

- Unit 1 is operating at 100% power.
- Operators are in the process of placing Train A Containment Purge in service to lower containment.

Which ONE of the following damper(s) is opened last to ensure that the lower ice doors remain closed during startup of the purge in accordance with SOI-30.2, "Containment Purge System?"

A. 1-FCV-30-2, Containment Purge Air Supply Fan 1A Discharge

B. 1-FCO-30-1A, Containment Purge Air Supply Fan 1A Suction

C. 1-FCV-30-213, Containment Purge Air Exhaust Fan 1A Discharge

D. 1-FCV-30-61, Containment Purge Air Exhaust Fan 1A Suction

42. Given the following conditions:

- Unit 1 was operating at 100% power when a LOCA occurred.
- While performing E-0, "Reactor Trip or Safety Injection," the operating crew manually actuated Phase B Containment Isolation after the automatic signal failed.
- During performance of E-1, "Loss of Reactor or Secondary Coolant," the operating crew is ready to stop the Containment Spray Pumps and place them in A-AUTO.

Which ONE of the following identifies...

(1) the signal(s) required to be reset to allow the pumps to remain off when the Containment Spray Pump handswitches are placed back in A-AUTO after resetting.

and

(2) the action required to reset the signal(s)?

A. (1) Containment Spray Signal, only
(2) Both Train A & B Reset pushbuttons are required to be pushed simultaneously.

B. (1) Phase B Signal and Containment Spray Signal
(2) Both Train A & B Reset pushbuttons are required to be pushed simultaneously.

C. (1) Containment Spray Signal, only
(2) The Train A and B Reset pushbuttons can be pushed independently.

D. (1) Phase B Signal and Containment Spray Signal
(2) The Train A and B Reset pushbuttons can be pushed independently.

43. Given the following:

- Unit 1 in service at 100% power.

Which ONE of the following competes the statement below?

A leak in the high pressure stage (second stage) of MSR __(1)__ will cause the temperature in the low pressure steam being supplied to the MFPTs to __(2)__.

	(1)	(2)
A.	A1	drop
B.	A1	rise
C.	C1	drop
D.	C1	rise

44. Given the following:

- Unit 1 is operating at 30% power when an instrument air line failure resulted in the #3 SG Main Feedwater reg valve closing.
- Operators tripped the reactor in anticipation of an automatic trip.
- Level in #3 SG dropped to 6% NR, and is recovering.
- Levels in 1, 2, and 4 SGs dropped to 28% NR, and are recovering.
- RCS is stabilized at normal RCS no load temperature and pressure.

Which ONE of the following indicates the status of the Auxiliary Feedwater (AFW) pumps?

A. Only the 1B-B AFW pump running.

B. Only the 1A-A and 1B-B AFW pumps running.

C. Only the TDAFW and 1B-B AFW pumps running.

D. All three AFW pumps running.

45. Unit 1 heatup is in progress in accordance with G0-1, "Unit Startup from Cold Shutdown to Hot Standby," following a Mode 5 outage with the following conditions:

    - RCS is currently at 320°F and 530 psig.
    - Auxiliary Feedwater (AFW) pumps 1A-A and 1B-B are in service.
    - A large leak develops near the bottom of the Condensate Storage Tank (CST).

    Which ONE of the following identifies the minimum CST level required by Technical Specification LCO 3.7.6, Condensate Storage Tank, and if the level continues to drop how AFW pumps 1A-A and 1B-B suction supply will be affected?

	Minimum Level	AFW Pumps
A.	200,000 gallons	Suction will automatically swap to ERCW due to low suction pressure.
B.	200,000 gallons	Suction will be manually transferred to ERCW when annunciator 63-A 'CST HDR TO AFW PMPS PRESS LO' alarms.
C.	116,000 gallons	Suction will automatically swap to ERCW due to low suction pressure.
D.	116,000 gallons	Suction will be manually transferred to ERCW when annunciator 63-A 'CST HDR TO AFW PMPS PRESS LO' alarms.

46. Given the following conditions:

- Unit 1 is operating at 100% power when a loss of offsite power occurs.
- The DGs restore voltage to the Shutdown Boards and the Blackout Relays are sequencing loads back to the boards.
- A Safety Injection occurs during the blackout sequencing.

Which ONE of the following identifies the events that occur due to the Safety Injection actuation?

A. Loads already sequenced on will remain on. Timers for equipment not already started will continue to run and the timers for the additional loads to be started due to the Safety injection will start to sequence the loads on.

B. Loads already sequenced on will remain on. The timers for equipment not already started will be reset to zero and the required loads will then be sequenced on.

C. Emergency Feeder breaker connecting the DG to the board will open causing the blackout sequence to restart. The Emergency Feeder breaker will reclose allowing the required loads to sequence on.

D. DG will remain connected to the board but the loads already sequenced on will load shed. Timers for the required loads will be reset to zero and the required loads will then be sequenced on.

47. Which ONE of the following identifies the normal and alternate power supplies to Reactor Coolant Pump # 3?

	Normal Supply	Alternate Supply
A.	USST '1A'	RCP Start Bus 'A'
B.	USST '1A'	RCP Start Bus 'B'
C.	USST '1B'	RCP Start Bus 'A'
D.	USST '1B'	RCP Start Bus 'B'

48. Which ONE of the following identifies batteries that will have loads shed during performance of AOI-40, "Station Blackout" and the benefit of shedding the load?

    A. 125V DC Diesel Generator Batteries to provide battery capacity for DC control and flashing the generator field when conditions allow the restart of the diesel generator.

    B. 125V DC Diesel Generator Batteries to provide battery capacity for prolonged continuous operation of the DC driven oil pumps on the diesel engines and turbocharger.

    C. 250V DC Station Batteries to provide battery capacity to support breaker operation for restoration of AC power to the Shutdown boards from the 500kV system.

    D. 250V DC Station Batteries to allow adequate battery capacity for longer operation of the DC oil pumps.

49. Given the following conditions:

- Unit 1 is in Mode 3 controlling Tave with the SG PORV Pressure Indicating Controllers (PICs) on 1-M-4 in manual.
- A ground develops on the GREEN indicating light socket in the control circuit for SG 3 PORV PCV-1-23.

Which ONE of the following identifies ...

(1) the Battery Board ground indicator where the ground would be displayed

and

(2) if the ground later caused the control fuse to blow, how would the manual operation of the PORV be continued?

A. (1) 125v DC Vital Battery Board I
(2) Control would be from the PIC

B. (1) 125v DC Vital Battery Board I
(2) Local control would be required

C. (1) 125v DC Station Battery Board IV
(2) Control would be from the PIC

D. (1) 125v DC Station Battery Board IV
(2) Local control would be required

50. Which ONE of the following describes the Fuel Oil system on one of the four diesel generator sets?

A. Each of the DG engines has a priming pump that starts when the DG receives an emergency start signal.

B. Each of the DG engines has a priming pump that is running when the DG is in Standby Alignment.

C. There is one priming pump to supply both engines that starts when the DG receives an emergency start signal.

D. There is one priming pump to supply both engines that is running when the DG is in Standby Alignment.

51. Given the following:

- 6.9kV Shutdown Board 1A-A is being supplied by DG 1A-A following a blackout signal.
- The operating crew is in the process of removing the diesel generator from service in accordance with SOI-82.01, "Diesel Generator (DG) 1A-A."
- The crew is ready to parallel the shutdown boards Normal feed to the diesel generator and 1-HS-57-42, NORMAL - CSST C SYNC SWITCH, is in the SYN position.
- The synchroscope is rotating fast in the FAST direction.

Which ONE of the following identifies...

(1) the direction the diesel generator speed control switch will initially have to be manipulated to establish conditions for closing Shutdown Board 1A-A NOR supply breaker,

and

(2) the mode of speed control after the normal supply breaker (1716) is closed in parallel with the diesel?

A. (1) raise
(2) speed droop

B. (1) raise
(2) without speed droop

C. (1) lower
(2) speed droop

D. (1) lower
(2) without speed droop

52. Given the following plant conditions:

- The Radwaste AUO is in the process of making a liquid radwaste release from the Monitor tank.
- 0-RM-90-122, WDS Liquid Effluent, has just been placed in service.
- Effluent radiation levels rose sharply during the release, causing a high radiation alarm on 0-RM-90-122.

Which of the following would occur?

A. 0-RCV-77-43, Cooling Tower Blowdown Radiation Release Control, will automatically close terminating the release.

B. 0-FCV-27-100 and 101, Cooling Tower Blowdown Diffuser Valves, will automatically close to direct the effluent to the holding pond.

C. 0-RCV-77-43, Cooling Tower Blowdown Radiation Release Control, must be manually closed to terminate the release.

D. 0-FCV-27-100 and 101, Cooling Tower Blowdown Diffuser Valves, must be manually closed to direct the effluent to the holding pond.

53. Given the following:

- Unit 1 is in Mode 1 when the 2B-B ERCW Strainer clogs.
- AOI-13, "Loss of Essential Raw Cooling Water," is implemented.

Which ONE of the following identifies the CCS Heat Exchanger whose CCS outlet temperature would increase and a requirement that must be implemented if the Train-B Supply Headers were cross-tied in accordance with AOI-13 due to the strainer being clogged?

A. CCS Heat Exchanger B;
Train-B Flow Balance valves must be repositioned.

B. CCS Heat Exchanger B;
ERCW Strainer 1B-B must be maintained in continuous backwash.

C. CCS Heat Exchanger C;
Train-B Flow Balance valves must be repositioned.

D. CCS Heat Exchanger C;
ERCW Strainer 1B-B must be maintained in continuous backwash.

54. Which ONE of the following identifies the power supply to the "B" Aux Air Compressor?

A. 480V C & A Vent Board 2B1-B

B. 480V C & A Vent Board 1B1-B

C. 480V Reactor MOV Board 2B1-B

D. 480V Reactor MOV Board 1B1-B

55. Given the following:

- A large break LOCA has occurred on Unit 1.

Which ONE of the following indicates where an operator is able to determine if 1-FCV-81-12, Primary Water To PRT and Standpipes, is in its correct position?

A. On 1-M-5, only

B. On 1-M-5 or 0-L-2

C. On 1-M-5 or on the Phase A CNTMT ISOL STATUS PNL on 1-M-6

D. On 1-M-5 or on the Phase B CNTMT ISOL STATUS PNL on 1-M-6

56. Given the following conditions:

- Unit 1 is in MODE 3 with RCS at 557°F and 2235 psig.
- Reactor trip breakers are closed.

Which ONE of the following identifies...

(1) a combination of RCPs that could be shutdown for maintenance leaving the pressurizer sprays effective in controlling pressure

and

(2) if Tech Spec LCO 3.4.5 RCS Loops - MODE 3 would be required to be entered when the 2 RCPs were shutdown?

Pressurizer Sprays	LCO 3.4.5
A. RCPs #1 and #3	Entry required
B. RCPs #1 and #4	Entry **NOT** required
C. RCPs #2 and #3	Entry required
D. RCPs #2 and #4	Entry **NOT** required

57. Given the following:

- Unit 1 initially operating at 100% power with AFD at -3.4% and Permissive window 64F, C-11 BANK D AUTO WITHDRAWAL BLOCKED, lit when a feedwater malfunction induces a transient.
- When the Unit is stabilized at 80% power following the transient, the OAC reports that Control Bank D M8 rod is indicating 28 steps withdrawn while the other rods in the group are within the required alignment with the Step Counters at 190 steps.

Which ONE of the following identifies the status of the 'Any Rod On Bottom' light on the CEPRI display and the core condition resulting from the mispositioned control rod?

	Any Rod on Bottom Light	Core Condition
A.	LIT	AFD moving toward '0'
B.	**NOT** LIT	AFD moving toward '0'
C.	LIT	QPTR increasing
D.	**NOT** LIT	QPTR increasing

58. Given the following:

- Unit 1 reactor startup is in progress and the OAC announces the reactor is critical.
- Window 65-D, P-6 INTERM RANGE PERMISSIVE, alarms on the Bypass, Intk & Permissive annunciator panel.

Which ONE of the following identifies...

(1) the condition required to cause window 65-D to light

and

(2) how the window will be affected when the operator manually blocks the Source Range Reactor Trip?

A. (1) When <u>either</u> IRM rises above 1.66 $X10^{-4}$% power
(2) The window will go DARK.

B. (1) When <u>either</u> IRM rises above 1.66 $X10^{-4}$% power
(2) The window will remain LIT.

C. (1) Only when <u>both</u> IRMs rise above 1.66 $X10^{-4}$% power
(2) The window will go DARK.

D. (1) Only when <u>both</u> IRMs rise above 1.66 $X10^{-4}$% power
(2) The window will remain LIT.

59. Given the following:

- Unit 1 is in MODE 4.
- Steam Generator levels are being maintained at setpoint using the motor-driven AFW pumps.

Which ONE of the choices below completes the following two statements?

1-PCV-3-122, AUX FEEDWATER PMP 1A-A DISCHARGE PRESS CONTROL, will CLOSE if the measured differential pressure signal that inputs to 1-PDIC-3-122A, AFW PMP A-A Disch Press Control, fails _____.

The valve could then be reopened by placing 1-PDIC-3-122A in manual and _____ the controller output.

A. Low;
Raising

B. Low;
Lowering

C. High;
Raising

D. High;
Lowering

60. Which ONE of the following describes the direct source of 480v power to the Containment Hydrogen Recombiners?

A. Reactor Vent Boards

B. Reactor MOV Boards

C. C & A Bldg Vent Boards

D. Aux Building Common Board Buses

61. Given the following:

- Unit 1 is at 100% power.
- SGBD is in service with 1-HS-15-44, SG BLOWDOWN DISCH TO CTBD, is in the OPEN position.
- 1-HS-15-44 is to be returned to AUTO position in accordance with SOI-15.01, "Steam Generator Blowdown System."

Which ONE of the following identifies...

(1) if the handswitch key would be required to change the position of the switch from OPEN to AUTO

and

(2) how the automatic isolation on the valve is affected when the handswitch position is changed to AUTO?

A. (1) Yes, the key is required for all operations of the handswitch.
(2) A high rad isolation will be placed in service.

B. (1) Yes, the key is required for all operations of the handswitch.
(2) A low dilution flow isolation will be placed in service.

C. (1) No, the key is only required when going from AUTO to OPEN.
(2) A high rad isolation will be placed in service.

D. (1) No, the key is only required when going from AUTO to OPEN.
(2) A low dilution flow isolation will be placed in service.

62. Which ONE of the following identifies the normal Condensate operating temperature limit in accordance with SOI-2&3.01, Condensate and Feedwater System, and the purpose of the limit?

A. 140°F, to limit backpressure in the MFPT Condensers.

B. 140°F, to prevent damage to Condensate Demin Resin.

C. 150°F, to limit backpressure in the MFPT Condensers.

D. 150°F, to prevent damage to Condensate Demin Resin.

63. With Unit 1 operating at 100% power the following occurs:

- Annunciator window 184-B "SFP 0-RM-102/103 RAD HI" alarms.
- 0-RM-90-102, Spent Fuel Pit Area, has the RED 'HIGH' light lit.
- 0-RM-90-103, Spent Fuel Pit Area, has only the GREEN 'OPERATE' light lit.

Which ONE of the following identifies the status of the ABGTS Cleanup Fans and the release point for any release from the Aux Building Ventilation system?

A. Only Train A ABGTS fan running and the release point is through a Shield Building Vent.

B. Only Train A ABGTS fan running and the release point is through the Auxiliary Building Vent.

C. Only Train B ABGTS fan running and the release point is through a Shield Building Vent.

D. Only Train B ABGTS fan running and the release point is through the Auxiliary Building Vent.

64. Given the following:

- A break on the Train A essential air header has resulted in rapidly decreasing air pressure.

As the air pressure drops, which ONE of the following identifies the highest pressure where 0-FCV-32-82, ESSENT CONTROL AIR TR A NORM FLOW ISOL, will have automatically closed?

A. 88 psig

B. 82 psig

C. 76 psig

D. 70 psig

65. With Unit 1 operating at 100% reactor power the following occurs:

- The fire protection system detects a fire in the 2A-A Diesel Generator Room but the automatic fire suppression system fails to actuate.
- Personnel at the DG building confirm the fire exists and report the Manual-electric push button outside the room door has failed to initiate the system.

Which ONE of the following identifies...

(1) an impact of the failure of the fire suppression system to initiate on the fire dampers and doors,
and
(2) the actions directed in SOI-39.02, "DG CO2 System," to manually initiate CO_2?

A. (1) Fire dampers and doors will not close prior to CO_2 release.

(2) Place DG Room 2A-A Pilot Valve to open using only the lever outside the room door.

B. (1) Fire dampers and doors will close when the heat from the fire melts fusible links.
(2) Place DG Room 2A-A Pilot Valve to open using only the lever outside the room door.

C. (1) Fire dampers and doors will not close prior to CO_2 release.

(2) Open the master routing valve in the CO_2 tank room, then place DG Room 2A-A Pilot Valve to open using the lever outside the room door.

D. (1) Fire dampers and doors will close when the heat from the fire melts fusible links.
(2) Open the master routing valve in the CO_2 tank room, then place DG Room 2A-A Pilot Valve to open using the lever outside the room door.

66. Which ONE of the following identifies the maximum time Standing Orders and Shift Orders should normally remain in effect in accordance with ODM-1.0, "Standing Orders and Shift Orders?"

	Standing Orders	Shift Orders
A.	90 days	7 days
B.	90 days	30 days
C.	1 year	7 days
D.	1 year	30 days

67. Given the following:

- An individual is in the process of reactivating his/her RO license in accordance with OPDP-10, "License Status Maintenance, Reactivation and Proficiency for Non-Licensed Positions."

Which ONE of the following completes the two statements below in accordance with OPDP-10?

In addition to being documented in Appendix A, "Return to Active Status Checklist," narrative log entries are required to be made __(1)__.

In addition to time and date, the minimum required log entry at the beginning of each shift during the reactivation is the __(2)__.

A. (1) only at the beginning and end of each shift completed
(2) Shift Position assumed and name of the operators providing supervision

B. (1) only at the beginning and end of each shift completed
(2) Shift Position assumed and accumulated hours under instruction

C. (1) at the beginning and end of each shift completed and for the plant tour
(2) Shift Position assumed and name of the operators providing supervision

D. (1) at the beginning and end of each shift completed and for the plant tour
(2) Shift Position assumed and accumulated hours under instruction

68. Given the following:

- Unit 1 is operating at 100% reactor power.
- Annunciator window 89-E "PZR SPRAY TEMP LO" alarms.

Which ONE of the following identifies...

(1) the condition that would cause the alarm

and

(2) a diverse indication that would validate the condition did exist?

	Condition	Diverse Indication
A.	Pressurizer spray bypass flow LOW	Pressurizer surge line temperature RISING
B.	Pressurizer spray bypass flow LOW	Pressurizer surge line temperature DROPPING
C.	Pressurizer spray bypass flow HIGH	Pressurizer surge line temperature RISING
D.	Pressurizer spray bypass flow HIGH	Pressurizer surge line temperature DROPPING

69. Which ONE of the following identifies only plant processes which can be used for configuration control in accordance with SPP-10.1, "System Status Control?"

A. Caution Tag
TACF
Work Order

B. Hold Order
TACF
Work Order

C. Caution Tag
Hold Order
Work Order

D. Caution tag
Hold Order
TACF

70. During a unit outage, which ONE of the following identifies...

(1) the lowest level of reduced Defense in Depth identified by Outage Risk Assessment Management (ORAM) that requires a contingency plan to be in place prior to entering the condition

and

(2) how protected equipment logged in the OSSDM 4.0, "Operational Defense in Depth Assessment," will be tracked when the equipment is still required to be protected following completion of the outage?

Note:
ODM - Operations Directive Manual
OSSDM - Outage and Site Scheduling Directive Manual

	Risk Level requiring a Contingency plan	Protection tracking
A.	Yellow	Protective devices will be transferred to ODM 4.0, "Protected Equipment," log.
B.	Yellow	OSSDM log will remain open until equipment protection is not required.
C.	Orange	Protective devices will be transferred to ODM 4.0, "Protected Equipment," log.
D.	Orange	OSSDM log will remain open until equipment protection is not required.

71. With Unit 1 operating at 100% power the following annunciator windows alarm:

174-B, "1-RR-90-1 AREA RAD HI"
174-E, "1-RR-90-1 AREA MONITORS INSTR MALF"

If a momentary loss of power to 1-RM-90-61, Incore Instr Room, caused the alarms, which ONE of the following identifies...

(1) the status of the radiation monitor's 'OPERATE' light (GREEN Light) on 0-M-12

and

(2) when responding to the alarms, the location where the 'source check' for the monitor can be performed?

	GREEN light	Source Check
A.	LIT	Main Control Room
B.	LIT	Locally at the monitor
C.	DARK	Main Control Room
D.	DARK	Locally at the monitor

72. Following a Unit 1 reactor trip from 100% power, the plant is being maintained in Hot Standby when the following conditions develop:

- Annunciator windows lit:
  175-B - "VAC PMP EXH 1-RM-119 RAD HI"
  178-A - "SG BLDN 1-RM-120/121 LIQ RAD HI"

- Steam Generator (SG) parameters are as follows:

	SG 1	SG 2	SG 3	SG 4
NR Level	42% (stable)	35% (rising)	38% (lowering)	33% (rising)
AFW Flow	80 gpm	0 gpm	0 gpm	230 gpm

Which ONE of the following is an action required to be taken?

A. Raise #2 SG Atmospheric relief valve setpoint.

B. Raise #3 SG Atmospheric relief valve setpoint.

C. Isolate the Steam Supply from the #1 SG to the TD AFW Pump turbine.

D. Isolate the Steam Supply from the #4 SG to the TD AFW Pump turbine.

73. In accordance with TI-12.04, "User's Guide For Abnormal and Emergency Operating Instructions," which ONE of the choices below completes the following statements?

Emergency Operating Instruction (EOI) Network must be entered if a Reactor Trip or a Safety Injection occurred while the plant was operating in __(1)__.

While performing ES-0.1, "Reactor Trip Response," an AOI __(2)__ be performed concurrently without being directed by ES-0.1.

A. (1) Modes 1, 2, 3, and 4
(2) may

B. (1) Modes 1, 2, 3, and 4
(2) may **NOT**

C. (1) Modes 1, 2, and 3, only
(2) may

D. (1) Modes 1, 2, and 3, only
(2) may **NOT**

74. Given the following:

- A small break LOCA is in progress on Unit 1 and a loss of all offsite power has occurred.
- DG 1B-B failed when it attempted to start.
- The crew is performing ES-1.2, "Post LOCA Cooldown and Depressurization" and an operator has been dispatched to perform Appendix B, "CLA Breaker Operation" to restore power to the cold leg accumulator isolation valves.

Which ONE of the following identifies the CLA isolation valves that can be closed when the Appendix is complete?

Note:
1-FCV-63-118, CL Accum 1 Outlet
1-FCV-63-98, CL Accum 2 Outlet
1-FCV-63-80, CL Accum 3 Outlet
1-FCV-63-67, CL Accum 4 Outlet

A. 1-FCV-63-118 and 1-FCV-63-98

B. 1-FCV-63-80 and 1-FCV-63-67

C. 1-FCV-63-118 and 1-FCV-63-80

D. 1-FCV-63-98 and 1-FCV-63-67

75. After a Safety Injection on Unit 1 resulting from a SG #1 steam line break, the following occurs:

- An AUO is dispatched to perform E-2, "Faulted Steam Generator Isolation," Attachment 1 "(E2)" because 1-FCV-1-4, SG #1 MSIV, failed to close from its handswitch.
- The valve again failed to close when control is transferred in the Auxiliary Control Room and the AUO proceeds to remove the control fuses.

Which ONE of the following identifies...

(1) the location of the fuses that are removed during performance of the Attachment

and

(2) an operational effect if the valve closes following fuse removal?

A. (1) In 125V DC Vital Battery Board I fuse column, only.
(2) An alternate means to determine valve status would be required because 1-HS-1-4A indicating lights would be DARK.

B. (1) In 125V DC Vital Battery Board I fuse column, only.
(2) The valve status could be determined by the GREEN indicating light on 1-HS-1-4A being LIT.

C. (1) In 125V DC Vital Battery Boards I and II fuse columns.
(2) An alternate means to determine valve status would be required because 1-HS-1-4A indicating lights would be DARK.

D. (1) In 125V DC Vital Battery Boards I and II fuse columns.
(2) The valve status could be determined by the GREEN indicating light on 1-HS-1-4A being LIT.

08/2010 RO NRC Written Exam Reference Package

1. Steam Tables
2. AOI-14, Loss of RHR Cooling, 1 page

Appendix A
(Page 1 of 1)

Approximate Time to Core Boil

DAYS AFTER SHUTDOWN	POWER (MW)	T-BOIL-1 (MIN)	T-BOIL-2 (MIN)
1	17	5	6
2	14	6	7
3	13	7	8
4	12	7	9
6	11	8	10
8	10	9	11
10	9	10	12
17	7	12	15
24	6	14	17
31	5	16	19

T-BOIL-1 = Time to boil at midloop with starting temp of 140°F.

T-BOIL-2 = Time to boil for all elevations above 720.75 with starting temp of 140°F.

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RO EXAM KEY

#	ID	Points	Type	Answers
1	007 EK3.01 1	1.00	MCS	B
2	008 AK2.01 2	1.00	MCS	A
3	009 EA2.23 203	1.00	MCS	D
4	011 EK2.02 104	1.00	MCS	D
5	022 AA1.01 105	1.00	MCS	C
6	025 AG2.1.7 6	1.00	MCS	B
7	029 EA1.08 7	1.00	MCS	B
8	038 EK1.03 8	1.00	MCS	B
9	040 AK1.05 9	1.00	MCS	D
10	054 AG2.1.23 10	1.00	MCS	D
11	055 EK3.02 11	1.00	MCS	B
12	057 G2.4.1 12	1.00	MCS	B
13	058 AA2.02 113	1.00	MCS	C
14	062 AA2.03 14	1.00	MCS	D
15	065 AK3.03 215	1.00	MCS	B
16	W/E04 EK1.3 216	1.00	MCS	D
17	W/E05 EA1.2 17	1.00	MCS	A
18	W/E11 EK2.1 118	1.00	MCS	C
19	003 AG2.4.1 119	1.00	MCS	D
20	005 AK1.05 20	1.00	MCS	C
21	032 AK2.01 121	1.00	MCS	A
22	033 AA2.03 22	1.00	MCS	A
23	036 G 2.4.46 223	1.00	MCS	B
24	037 AA1.04 124	1.00	MCS	A
25	061 AK2.01 25	1.00	MCS	D
26	076 AA2.02 126	1.00	MCS	C
27	W/E02 EK3.1 227	1.00	MCS	C
28	003 K5.04 28	1.00	MCS	D
29	003 K6.14 129	1.00	MCS	B
30	004 K6.36 130	1.00	MCS	B
31	005 K5.01 131	1.00	MCS	A
32	006 K2.01 132	1.00	MCS	D
33	006 K6.13 233	1.00	MCS	C
34	007 A1.01 134	1.00	MCS	B
35	008 A2.05 35	1.00	MCS	D
36	008 A4.10 136	1.00	MCS	A
37	010 A3.01 37	1.00	MCS	C
38	012 K1.05 238	1.00	MCS	A
39	013 G2.4.6 39	1.00	MCS	A
40	022 G2.2.36 240	1.00	MCS	A
41	025 K1.01 41	1.00	MCS	A
42	026 A4.05 42	1.00	MCS	C
43	039 K3.04 43	1.00	MCS	A
44	059 K3.02 44	1.00	MCS	D
45	061 A1.04 145	1.00	MCS	A

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RO EXAM KEY

#	ID	Points	Type	Answers
46	062 A3.05 146	1.00	MCS	B
47	062 K2.01 47	1.00	MCS	C
48	063 A1.01 148	1.00	MCS	C
49	063 A2.01 149	1.00	MCS	A
50	064 K1.03 50	1.00	MCS	A
51	064 K4.03 51	1.00	MCS	C
52	073 K4.01 152	1.00	MCS	A
53	076 A2.01 53	1.00	MCS	D
54	078 K2.02 54	1.00	MCS	A
55	103 A3.01 155	1.00	MCS	C
56	002 K6.07 56	1.00	MCS	B
57	014 A1.04 257	1.00	MCS	D
58	015 A3.03 58	1.00	MCS	B
59	016 K3.06 59	1.00	MCS	A
60	028 K2.01 60	1.00	MCS	A
61	035 G2.1.20 61	1.00	MCS	B
62	056 G2.1.32 62	1.00	MCS	B
63	072 K4.03 63	1.00	MCS	A
64	079 K1.01 364	1.00	MCS	C
65	086 A2.04 165	1.00	MCS	D
66	G 2.1.15 166	1.00	MCS	D
67	G 2.1.18 167	1.00	MCS	C
68	G 2.1.45 68	1.00	MCS	B
69	G 2.2.15 369	1.00	MCS	B
70	G 2.2.18 170	1.00	MCS	C
71	G 2.3.5 71	1.00	MCS	C
72	G 2.3.11 172	1.00	MCS	A
73	G 2.4.16 173	1.00	MCS	C
74	G 2.4.34 174	1.00	MCS	C
75	G 2.4.35 75	1.00	MCS	D