U.S. Nuclear Regulatory Commission

Site-Specific SRO 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 overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

_____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	_____ / _____ / _____ Points
Applicant's Scores	_____ / _____ / _____ 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

(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 <u>initially</u> have to be manipulated to establish conditions for closing Shutdown Board 1A-A NOR supply breaker,

and

(2) the mode of speed control <u>after</u> 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.

76. Given the following events and conditions:

- Unit 1 is operating at 100% power when FCV-62-93, Charging Flow Control, malfunctioned to limit charging flow to 65 gpm.
- Normal letdown is in service at 75 gpm.
- Identified leakage is at the Tech Spec Limit.
- Unidentified leakage is 0.01 gpm.
- RCP seal leak-off is 3 gpm per pump.

Assuming the unit maintains normal operating temperature and pressure, which ONE of the following identifies...

(1) if no operator actions are taken, approximately how much time will elapse before annunciator window 92-C "PZR LEVEL LO-HTRS OFF & LTDN CLOSED" alarms

and

(2) an effect resulting from a loss of pressurizer heaters in accordance with Tech Spec Basis?

REFERENCE PROVIDED

	TIME	RESULT
A.	approx. 82 minutes	Loss of the ability to maintain the RCS in a hot pressurized condition to support subcooled natural circulation for an extended period.
B.	approx. 82 minutes	Loss of the ability to maintain the pressurizer boron concentration equalized with the RCS boron concentration.
C.	approx. 115 minutes	Loss of the ability to maintain the RCS in a hot pressurized condition to support subcooled natural circulation for an extended period.
D.	approx. 115 minutes	Loss of the ability to maintain the pressurizer boron concentration equalized with the RCS boron concentration.

77. Unit 1 is in Mode 4 with Train A RHR in service during unit cooldown when the following occurs:

1405 - Annunciator 160-C, RX BLDG POCKET SUMP LEVEL HI, alarms.
1407 - Annunciator 159-C, RX BLDG F&EQ SUMP LEVEL HI, alarms.
1407 - OAC notes pressurizer pressure and level are dropping.

Which ONE of the following identifies...

(1) the Abnormal Operating Instruction that must be used to mitigate the above event

and

(2) the minimum required steam generator Narrow Range level for using an RCS loop to satisfy Tech Spec LCO 3.4.6, RCS Loops - Mode 4, in accordance with the Tech Spec Bases?

A. (1) AOI-14, "Loss of RHR Shutdown Cooling"
(2) at least 39%

B. (1) AOI-14, "Loss of RHR Shutdown Cooling"
(2) at least 32%

C. (1) AOI-6, "Small Reactor Coolant System Leak"
(2) at least 39%

D. (1) AOI-6, "Small Reactor Coolant System Leak"
(2) at least 32%

78. Given the following:

- Unit 1 is operating at 8% power.
- Pressurizer PORV 334 fails open and mechanically binds in the open position.
- Operator closes the Block valve for pressurizer PORV 334.
- Pressurizer pressure drops to approximately 1940 psig and begins to recover. Reactor Power remains at 8%.
- Parts required for repair will not be available for 96 hours.

Which ONE of the following identifies...

(1) if conditions indicate a failure of SSPS Train A during the transient

and

(2) if the PORV Tech Spec requires a plant shutdown?

	(1) SSPS Train A failure...	(2) Shutdown Required
A.	did occur.	Yes
B.	did occur.	No
C.	did **NOT** occur.	Yes
D.	did **NOT** occur.	No

79. Given the following:

- Unit 1 is operating at 100% power.
- Both 161kV offsite power supplies are lost due to a storm causing damage to the Watts Bar Hydro switchyard.
- All 4 diesel generators restore power to their respective Shutdown Boards.

If neither offsite power supply can be restored within the required time, which ONE of the following identifies...

(1) the required REP classification that must be declared

and

(2) the maximum time allowed prior to contacting the Tennessee Emergency Management Agency directly if the Operations Duty Specialist cannot be contacted following the declaration of the event in accordance with the Emergency Plan Implementing Procedure?

REFERENCE PROVIDED

	Classification	Time
A.	NOUE	5 minutes after the declaration
B.	NOUE	10 minutes after the declaration
C.	ALERT	5 minutes after the declaration
D.	ALERT	10 minutes after the declaration

80. Given the following:

- A loss of control air occurs due to a non-isolatable control air header rupture in the Turbine Building.
- The reactor was tripped and a transition to ES-0.1, "Reactor Trip Response" has been made.

Assuming NO operator action is taken, which ONE of the following identifies the Safety Function Restoration procedure whose entry conditions will be met in accordance with FR-0, "Status Trees?"

A. FR-H.4, "Loss of Normal Steam Release Capabilities"

B. FR-P.2, "Cold Overpressure Condition"

C. FR-H.5, "Low Steam Generator Level"

D. FR-I.1, "High Pressurizer Level"

81. Given the following:

- The crew is performing ECA-1.1, "Loss of Sump Recirculation," due to an Intersystem LOCA outside of containment.
- SI termination criteria has just been met.
- When performing the step to check Aux Air pressure, the pressures are determined to be 70 psig, requiring the crew to ensure affected train isolation valves 0-FCV-32-82, Essential Control Air Train A Normal Flow Isolation, and 0-FCV-32-85, Essential Control Air Train B Normal Flow Isolation, are positioned correctly.

Which ONE of the following identifies...

(1) the procedure the crew will use to terminate the Safety Injection

and

(2) the location of the controls for 0-FCV-32-82 and 0-FCV-32-85?

	(1)	(2)
A.	Remain in ECA-1.1 to terminate the SI.	On 1-M-15 in the Main Control Room
B.	Transition to ES-1.1, "SI Termination."	On 1-M-15 in the Main Control Room
C.	Remain in ECA-1.1 to terminate the SI.	Elevation 757 in the Auxiliary Building
D.	Transition to ES-1.1, "SI Termination."	Elevation 757 in the Auxiliary Building

82. Which ONE of the following identifies the thermal power restriction required by Tech Spec 3.1.5, Rod Group Alignment Limits if the unit is to be operated with a control rod misaligned for more than 2 hours and the Bases for the restriction?

Thermal power must be restricted to less than or equal to __(1)__ and the Bases is _____(2)_____.

	(1)	(2)
A.	75%	to ensure that Local Heat Rate increases due to the misaligned RCCA will **NOT** cause the core design criteria to be exceeded.
B.	75%	to ensure that core limits will **NOT** be exceeded during a Design Basis Event for the duration of operation with the rod misaligned.
C.	50%	to ensure that Local Heat Rate increases due to the misaligned RCCA will **NOT** cause the core design criteria to be exceeded.
D.	50%	to ensure that core limits will **NOT** be exceeded during a Design Basis Event for the duration of operation with the rod misaligned.

83. Given the following:

- The crew has entered AOI-34, "Immediate Boration," due to an uncontrolled RCS cooldown following a reactor trip.
- The crew initiates action to establish the boration flow using normal boration.
- Annunciator window 111-E "BA TO BLENDER FLOW DEVIATION" alarms and the deviation can **NOT** be corrected.

Which ONE of the following identifies...

(1) the effect the condition will have on the boric acid flow

and

(2) a basis of the Boric Acid Storage Tank in accordance with TR 3.1.6, Borated Water Sources, Operating?

A. (1) Automatic isolation of the Boric acid flow will occur.
(2) Provides chemical shim reactivity control.

B. (1) Automatic isolation of the Boric acid flow will occur.
(2) Mitigates consequences of a design bases accident.

C. (1) Boric acid flow will continue with the alarm condition
(2) Provides chemical shim reactivity control.

D. (1) Boric acid flow will continue with the alarm condition
(2) Mitigates consequences of a design bases accident.

84. Given the following:

- Unit 1 is at 100% power.
- The crew opened the Unit 2 RB Equip Access Doors (Blast Doors) in accordance with SOI-410, "Interim ABSCE Boundary Rolling Doors (U-2 Reactor Bldg)."
- A fitting on the pressure instrument tap on the in-service Waste Gas Decay Tank is leaking gas from the tank.

Which ONE of the following describes the radiation monitor that would detect the accidental gaseous radwaste release?

The Radiation Monitor is ...

A. a PAM qualified instrument and is used in determining REP EALs.

B. a PAM qualified instrument but is **NOT** used in determining REP EALs.

C. **NOT** a PAM qualified instrument but is used in determining REP EALs.

D. **NOT** a PAM qualified instrument and is **NOT** used in determining REP EALs.

85. Unit 1 is in a Refueling outage with the following conditions:

- Reactor core has been off-loaded to the Spent Fuel Pit.
- Spent fuel shuffles in the Spent Fuel Pit are planned for later in the shift.

The following occurs during the shift:

0900 - 0-HS-90-136A2, VENT ISOL RAD MON BLOCK, is placed to the 0-103 position with the handswitch in the PULL-TO-TEST position to support maintenance.

1000 - Train A ABGTS is placed in service for performance of 0-SI-30-8-A, "Auxiliary Building Gas Treatment System Train A 10-Hour Operation."

1100 - The spent fuel assembly shuffles begin in the spent fuel pit.

1400 - Annunciator 184-D "SFP 0-RM-102/103 INSTR MALF" alarms.
- 0-RM-90-102, Spent Fuel Pit Area Monitor, has no indicating lights LIT.
- 0-RM-90-103, Spent Fuel Pit Area Monitor, has only the GREEN indicating light LIT.

Which ONE of the following identifies...

(1) the <u>earliest</u> time a Tech Spec LCO Condition entry was required to be entered due to the status of the Spent Fuel Pit area radiation monitors,

and

(2) if conditions required by Tech Specs can be established at 1400 to allow continued fuel movement with the current status of the Spent Fuel Pit area radiation monitors?

A. (1) 1100
(2) No, fuel shuffles must be stopped.

B. (1) 1400
(2) No, fuel shuffles must be stopped.

C. (1) 1100
(2) Yes, fuel shuffles can continue.

D. (1) 1400
(2) Yes, fuel shuffles can continue.

86. Given the following:

- Unit 1 is at 100% power with the following annunciators LIT on 1-M-5.
  100-E - RCP SEAL LEAK-OFF FLOW LO
  100-C - RCP #1 SEAL OUTLET TEMP HI

- MCR indications for Loop 3 RCP seal parameters are:

Supply	9.6 gpm and stable
Leakoff	0.5 gpm and stable
Outlet Temperature	179°F and stable

Which ONE of the following identifies...

(1) the Section of AOI-24, "RCP Malfunction During Pump Operation," required to be performed

and

(2) if the initiation of a controlled plant shutdown to Mode 3 is required by the AOI?

A. (1) Section 3.5, "#2 Seal Leakoff Flow HIGH"
   (2) Plant shutdown is **NOT** required.

B. (1) Section 3.5, "#2 Seal Leakoff Flow HIGH"
   (2) Plant shutdown is required.

C. (1) Section 3.4, "#1 Seal Leakoff Flow LOW"
   (2) Plant shutdown is **NOT** required.

D. (1) Section 3.4, "#1 Seal Leakoff Flow LOW"
   (2) Plant shutdown is required.

87. Given the following:

- Unit 1 is at midloop with RCS level at 718' 9" following a refueling outage.
- The operating crew has drawn a vacuum on the Reactor Coolant System in accordance with GO-10, "Reactor Coolant System Drain and Fill Operations."
- RHR pump 1A-A is in service with 2100 gpm flow.
- The RHR pump amps and flow begin to fluctuate.

Which ONE of the following identifies...

(1) the first action the crew will take in accordance with GO-10 to mitigate the pump symptoms

and

(2) the mitigating strategy that will be implemented if the pump conditions cannot be stabilized?

	Action	Mitigating Strategy
A.	Raise RCS Level	Break vacuum per GO-10, then enter AOI-14, "Loss of RHR Shutdown Cooling."
B.	Raise RCS Level	Immediately enter AOI-14, "Loss of RHR Shutdown." Break vacuum as directed by the AOI.
C.	Lower RHR Flow	Break vacuum per GO-10, then enter AOI-14, "Loss of RHR Shutdown Cooling."
D.	Lower RHR Flow	Immediately enter AOI-14, "Loss of RHR Shutdown." Break vacuum as directed by the AOI.

88. Given the following conditions:

- The plant is at 100% power.
- 1-SI-99-10-A, "62 Day Functional Test of SSPS Train A and Reactor Trip Breaker A," is in progress.

During performance of the Surveillance Instruction (SI), which ONE of the following identifies...

(1) a condition where MFW Isolation Actuation handswitches are held in the Reset position to prevent the potential of a main feedwater isolation

and

(2) the status of the RTA Shunt Trip device if, during an engineering review 15 days after the maximum late date, it is determined that the steps to test the Reactor Trip Breaker (RTA) shunt trip were **not** performed?

	(1)	(2)
A.	When closing the Reactor Trip Breaker A (RTA).	Declare the Shunt Trip device inoperable until the SI steps are performed.
B.	When returning the Input Error Inhibit switch to normal.	Declare the Shunt Trip device inoperable until the SI steps are performed.
C.	When closing the Reactor Trip Breaker A (RTA).	Shunt Trip device remains operable provided the test is successfully performed within 24 hours.
D.	When returning the Input Error Inhibit switch to normal.	Shunt Trip device remains operable provided the test is successfully performed within 24 hours.

89. With Unit 1 operating at 60% power the following occurs:

- A transient on the condensate system resulted in all MFW Reg valves traveling full open.
- The SG #2 MFW Reg valve stuck at the full open position and operator efforts to control the valve were unsuccessful.

Without any manual action to initiate a unit trip by the operator, which ONE of the following identifies ...

(1) how the unit will trip

and

(2) the maximum time allowed to make the first report to the NRC in accordance with SPP-3.5. "NRC Reporting Requirements?"

A. (1) An automatic reactor trip will cause the main turbine to trip;
(2) 4 hours

B. (1) An automatic reactor trip will cause the main turbine to trip;
(2) 8 hours

C. (1) An automatic turbine trip will cause the reactor to trip;
(2) 4 hours

D. (1) An automatic turbine trip will cause the reactor to trip;
(2) 8 hours

90. Given the following:

- Unit 1 is operating at 100% power with 1-LCV-3-174 , SG 1 Supply From T-D Pump, out of service for maintenance.
- Annunciator windows alarm and are acknowledged by the OAC.
  - 41-F, "CONTROL AIR PRESS LO"
  - 42-F, "SERVICE AIR PCV-33-4 CLOSED"
  - 136-B, "AUX AIR TR-A PRESS LO"
- CRO reports...
  - 0-PI-32-104A, AUX AIR A PRESS, at 20 psig and dropping
  - 1-HS-32-80A, AUX AIR TO RX BLDG TR A, green light is lit.
- Annunciator window 41-F, "CONTROL AIR PRESS LO" begins to flash slowly.

Which ONE of the following identifies the procedure set(s) that will be required to be used in response to the event and what action will be required in accordance with Tech Spec 3.7.5, "Auxiliary Feedwater (AFW) System?"

Note:
AOIs - Abnormal Operating Instructions
EOIs - Emergency Operating Instructions

	Procedures	Tech Spec
A.	AOIs, only	Enter Condition B for one Train Inoperable
B.	AOIs, only	Enter Condition C for two Trains Inoperable
C.	Both AOIs and EOIs	Enter Condition B for one Train Inoperable
D.	Both AOIs and EOIs	Enter Condition C for two Trains Inoperable

91. Given the following:

- Unit 1 is in Mode 6 with core reload in progress.
- RHR pump 1B-B is inoperable due to motor failure.
- Planned shift activities will require the RHR pump 1A-A to be shutdown for 45 minutes.

In accordance with Tech Specs, which ONE of the following identifies if the operations listed below are permitted while RHR pump 1A-A is shutdown?

	Load a fuel assembly into the reactor vessel	Perform RCS to RHR inlet valves testing
A.	Allowed	Allowed
B.	Allowed	**NOT** allowed
C.	**NOT** allowed	Allowed
D.	**NOT** allowed	**NOT** allowed

92. Given the following:

- A cooldown is in progress to place Unit 1 in Mode 5.
- 'Wire lifts' have been performed in accordance with GO-6, "Unit Shutdown From Hot Standby To Cold Shutdown" to enable all 12 steam dump valves to be opened.
- While in this configuration, a loss of Turbine Building control air occurs.

Which ONE of the following identifies...

(1) how the "wire lift" enabling the dump valves to be open will be indicated in the Main Control Room,

and

(2) the action required to control RCS temperature following the loss of Turbine Building control air?

Note:
TACF - Temporary Alteration Control Form

A. (1) By use of a TACF tag issued in accordance with SPP-9.5, "Temporary Alteration."
(2) Control of SG PORVs can only be performed locally.

B. (1) By use of a TACF tag issued in accordance with SPP-9.5, "Temporary Alteration."
(2) Control SG PORVs from 1-M-4 in main control room.

C. (1) By use of a Caution Order tag issued in accordance with SPP-10.2, "Clearance Procedure to Safely Control Energy."
(2) Control of SG PORVs can only be performed locally.

D. (1) By use of a Caution Order tag issued in accordance with SPP-10.2, "Clearance Procedure to Safely Control Energy."
(2) Control SG PORVs from 1-M-4 in main control room.

93. Given the following:

- The plant is in Mode 6 and performing valve stroke exercising of 1-FCV-32-80, Essential Control Air Train A Containment Isolation Valve in accordance with 1-SI-32-901-A, "Valve Full Stroke Exercising During Cold Shutdown Control Air (Train A)."

- The following criteria applies to the valve stroke test:

	STROKE DIRECTION	MEASURED STROKE TIME (secs)	STROKE TIME ACCEPTANCE CRITERIA	LIMITING VALUE OF FULL STROKE TIME (secs)
First Test	O to C		1.23 to 3.69	0 to 4.92
Second Test				

- The first test of the valve measured stroke time was 4.0 seconds
- The second test of the valve was timed at 3.9 seconds.

Which of the following actions must be taken in accordance with 1-SI-32-901-A?

A. The valve is inoperable, but the LCO is Tracking Only until Mode 4 is entered.

B. The valve is inoperable, and enter LCO 3.6.3 and isolate the penetration within 4 hours.

C. The valve remains operable pending the outcome of an engineering analysis which must be completed within 96 hours of the test.

D. The valve remains operable until the next scheduled performance of the surveillance as long as the cause of the deviation is documented in the test data package.

94. Which ONE of the following identifies where the Shift Manager will maintain the latest revision of an ODMI in accordance with OPDP-11?

A. In the Standing Order book

B. In the Business Support Library (BSL)

C. In the Operations Directive Manual

D. In the eSOMS narrative log

95. Given the following:

- An ALERT has been declared on Unit 1.
- All emergency centers are activated.
- Conditions require AUO action to manually isolate 1-ISV-70-700, RCP OIL COOLER CCS RETURN ISOLATION [A4/V EL. 710 U-1 Penetration room] in accordance with E-0, "Reactor Trip Safety Injection," Attachment B3.

In accordance with EPIP-7, "Activation and Operation of the Operations Support Center (OSC)," which ONE of the following identifies the actions to coordinate and dispatch a team to isolate the valve?

A. OSC Team A stationed in the MCR will be sent to perform the task. The TSC/OSC will be notified that the team has been dispatched and the team's intended location and action.

B. OSC Team A stationed in the MCR will be sent to perform the task. TSC/OSC notification is not required because the OSC Team A is being tracked as assigned to the MCR.

C. After being notified of the task to be performed, the OSC staff will assign a team to perform the task. The team will be briefed, dispatched, and tracked by the OSC.

D. After being notified of the task to be performed, the OSC staff will dispatch a team to the MCR to be briefed prior to being sent to perform the task. The team will be tracked by the OSC.

96. An annunciator is to be disabled for 2 weeks in support of a planned maintenance activity on equipment that will remain in service while the annunciator is disabled.

Which ONE of the following is required in accordance with OPDP-4, "Annunicator Disablement," to allow the annunciator to be disabled?

A. Both a Technical Evaluation and a 50.59 review.

B. Neither a Technical Evaluation nor a 50.59 review.

C. A 50.59 review, only.

D. A Technical Evaluation, only.

97. Which ONE of the choices below completes the two statements in accordance with SPP-8.1, "Conduct of Test?"

The assignment of a senior line manager to assist the Shift Manager during performance of a Complex Infrequently Performed Test or Evolution (CIPTE) is the responsibility of the ____(1)_____ or designee.

The individual assigned responsibility for conducting the management expectations briefing for the test is the __(2)___ .

	(1)	(2)
A.	Plant Manager	Shift Manager
B.	Plant Manager	CIPTE Manager
C.	Operations Manager	Shift Manager
D.	Operations Manager	CIPTE Manager

98. Given the following plant conditions:

- The Unit is in Mode 5, with irradiated fuel assembly shuffles being performed in the Spent Fuel Pit.
- As part of performing 0-SI-90-5, "92 Day Channel Operational Test Of The General Atomic Main Control Room Intake Radiation Monitor Loop 0-LPR-90-125 Train A," a source check is directed to be performed on the radiation monitor.

Which ONE of the following identifies...

(1) the SRO responsibility for the Tech Spec LCO tracking Sheet Entry while the test is being performed

and

(2) the effect of performing the source check portion of the test?

Note:
CREVS - Control Room Emergency Ventilation System

A. The SRO will make an LCO Tracking Sheet entry that Train A of CREVS is inoperable.
This will result in an automatic actuation of Train A of CREVS.

B. The SRO will make an LCO Tracking Sheet entry that 0-RM-90-125 is inoperable.
This will result in an automatic actuation of Train A of CREVS.

C. The SRO will make an LCO Tracking Sheet entry that Train A of CREVS is inoperable.
The Hi Rad alarm will actuate but CREVS will not be actuated during the source check.

D. The SRO will make an LCO Tracking Sheet entry that 0-RM-90-125 is inoperable.
The Hi Rad alarm will actuate but CREVS will not be actuated during the source check.

99. In accordance with EPIP-1, "Emergency Plan Classification Flowchart," which ONE of the following identifies...

(1) which Fission Product Barriers use Containment Radiation in determining the integrity of the barrier

and

(2) how a failure of the Containment Air Return fans to start during an accident affects the accuracy of the monitors?

A. (1) Fuel Clad and RCS
(2) Monitors indicate lower than actual.

B. (1) Fuel Clad and Containment
(2) Monitors indicate lower than actual.

C. (1) Fuel Clad and RCS
(2) Monitors indicate higher than actual.

D. (1) Fuel Clad and Containment
(2) Monitors indicate higher than actual.

100. Which ONE of the following identifies ...

(1) the provisions for making Protective Action Recommendations (PARs) to the State during a Site Area Emergency (SAE)

and

(2) the individual who can assume the responsibility for PARs when the respective emergency center is staffed and operational?

A. (1) PARs are optional during a SAE
(2) CECC Director

B. (1) No provisions for making PARs during a SAE
(2) CECC Director

C. (1) PARs are optional during a SAE
(2) TSC RP Manager

D. (1) No provisions for making PARs during a SAE
(2) TSC RP Manager

08/2010 SRO NRC Written Exam Reference Package

1. Steam Tables
2. AOI-14, Loss of RHR Cooling, 1 page
3. 1-SI-68-32, Reactor Coolant System Water Inventory Balance, 1 page
4. EPIP-1, Emergency Plan Classification Flowchart, 4 pages,

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.

Appendix C
(Page 3 of 8)

Data Package: Page ____ **Date _____**

1.0 RCS WATER INVENTORY BALANCE CALCULATIONS (continued)

[4.4] **CALCULATE** INITIAL PZR VOLUME as follows:[4]

$$\text{INITIAL PZR VOLUME} = \left(\left(\frac{\text{PZR LVL}}{V_f}\right)+\left(\frac{100-\text{PZR LVL}}{V_g}\right)\right) X \left(\frac{16.73\,ft^3}{\%}\right) X \left(\frac{7.4805\,gal}{ft^3}\right) X 0.01605$$

$$\text{INITIAL PZR VOLUME} = \left(\left(\frac{\_\_\_\_\_\%}{\_\_\_\_\_\,ft^3/lbm}\right)+\left(\frac{100-\_\_\_\_\_\%}{\_\_\_\_\_\,ft^3/lbm}\right)\right) X \left(\frac{2\,gal\,ft^3}{\%\,lbm}\right)$$

INITIAL PZR VOLUME = _____ gallons

_____
1st

_____
CV

[4.5] **CALCULATE** FINAL PZR VOLUME as follows:[5]

$$\text{FINAL PZR VOLUME} = \left(\left(\frac{\text{PZR LVL}}{V_f}\right)+\left(\frac{100-\text{PZR LVL}}{V_g}\right)\right) X \left(\frac{16.73\,ft^3}{\%}\right) X \left(\frac{7.4805\,gal}{ft^3}\right) X 0.01605$$

$$\text{FINAL PZR VOLUME} = \left(\left(\frac{\_\_\_\_\_\%}{\_\_\_\_\_\,ft^3/lbm}\right)+\left(\frac{100-\_\_\_\_\_\%}{\_\_\_\_\_\,ft^3/lbm}\right)\right) X \left(\frac{2\,gal\,ft^3}{\%\,lbm}\right)$$

FINAL PZR VOLUME = _____ gallons

_____
1st

_____
CV

FISSION PRODUCT BARRIER MATRIX (Modes 1-4)

SYSTEM DEGRADATION

LOSS OF POWER

HAZARDS and SED JUDGMENT

DESTRUCTIVE PHENOMENON

SHUTDOWN SYSTEM DEGRADATION

RADIOLOGICAL

DEFINITIONS/ACRONYMS

UNUSUAL EVENT, ALERT, SITE AREA EMERGENCY and **GENERAL EMERGENCY**: (see SED Judgment 4.7).

BOMB: An explosive device (See EXPLOSION).

CIVIL DISTURBANCE: A group of twenty (20) or more persons violently protesting station operations or activities at the site.

CREDIBLE SITE-SPECIFIC -The determination is made by WBN senior plant management through use of information found in the Safeguards Contingency Plan.

CRITICAL-SAFETY FUNCTION (CSFs): A plant safety function required to prevent significant release of core radioactivity to the environment. There are six **CSFs**: Sub-criticality, Core Cooling, Heat Sink, Pressurized Thermal Shock, Integrity (Containment) and Inventory (RCS).

EVENT: Assessment of an **EVENT** commences when recognition is made that one or more of the conditions associated with the event exist. Implicit in this definition is the need for timely assessment, i.e. within 15 minutes.

EXCLUSION AREA BOUNDARY (EAB): The demarcation of the area surrounding the WBN units in which postulated FSAR accidents will not result in population doses exceeding the criteria of 10 CFR Part 100. Refer to Figure 7-A.

EXPLOSION: A rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures required for safe operation.

EXTORTION: An attempt to cause an action at the station by threat of force.

FAULTED: (Steam Generator) Existence of secondary side leakage (i.e., steam or feed line break) that results in an uncontrolled decrease in steam generator pressure or the steam generator being completely depressurized.

FIRE: Combustion characterized by heat and light. Source of smoke such as slipping drive belts or overheated electrical components do not constitute fires. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

FLAMMABLE GAS: Combustible gases maintained at concentrations less than the **LOWER EXPLOSIVE LIMIT (LEL)** will not explode due to ignition.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

HOSTILE ACTION: An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water; using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should NOT be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area.)

HOSTILE FORCE: Individual(s) involved with a HOSTILE ACTION. One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

INEFFECTIVE: The specified restoration action(s) does not result in a reduction in the level of severity of the RED PATH condition within 15 minutes from identification of the Core Cooling CSF Status Tree RED PATH. A reduction in the level of severity is an improvement in the applicable parameters, e.g., Increasing Trend in Reactor Vessel Water Level (Full RVLIS) and/or Decreasing Trend on Core Thermocouple Temperatures.

INITIATING CONDITIONS: Plant Parameters, radiation monitor readings or personnel observations that identify an Event for purposes of Emergency Plan Classification.

INTRUSION/INTRUDER: Suspected hostile individual present in a protected area without authorization.

ODCM: Offsite Dose Calculation Manual.

ORANGE PATH: Monitoring of one or more CSFs by FR-0 which indicates that the CSF(s) is under severe challenge.

PROJECTILE: An object ejected, thrown, or launched towards a plant structure. The source of the projectile may be onsite or offsite. Damage is sufficient to cause concern regarding the integrity of the affected structure or the operability or reliability of safety equipment contained therein.

PROTECTED AREA: Encompasses all owner controlled areas within the security protected area fence as shown on Figure 4-A.

RED PATH: Monitoring of one or more CSFs by the FR-0 which indicates that the CSF(s) is under extreme challenge; prompt operator action is required.

RUPTURED: (Steam Generator) Existence of primary to secondary leakage of a magnitude greater than charging pump capacity.

SABOTAGE: Deliberate damage, misalignment, or mis-operation of plant equipment with the intent to render the equipment inoperable.

SECURITY CONDITION- Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

SIGNIFICANT TRANSIENT: An UNPLANNED event involving one or more of the following: (1) An automatic turbine runback > 15% thermal reactor power; (2) Electrical load rejection > 25% full electrical load; (3) Reactor Trip or (4) Safety Injection System Activation.

SITE PERIMETER: Encompasses all owner controlled areas in the immediate site environs as shown on Figures 4-Aand 7-A.

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on TVA. The STRIKE ACTION must threaten to interrupt normal plant operations.

TOXIC GAS: A gas that is dangerous to life or limb by reason of inhalation or skin contact (e.g., chlorine).

UNPLANNED: An event or action that is not the expected result of normal operations, testing, or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

UNPLANNED: (With specific regard to radioactivity releases) A release of radioactivity is UNPLANNED if the release has not been authorized by a Discharge Permit (DP). Implicit in this definition are unintentional releases, unmonitored releases, or planned releases that exceed a condition specified on the DP, e.g., alarm setpoints, minimum dilution flow, minimum release times, maximum release rates, and/or discharge of incorrect tank.

VALID: An indication or report or condition is considered to be VALID when it is conclusively verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel. Implicit in this definition is the need for timely assessment, i.e., within 15 minutes.

VISIBLE DAMAGE: Damage to equipment that is readily observable without measurements, testing, or analyses. Damage is sufficient enough to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, and/or paint blistering. Surface blemishes (e.g., paint chipping, scratches) should NOT be included.

VITAL AREA: Is any area within the PROTECTED AREA which contains equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

	3.1 Loss of AC (Power Ops)	
	Mode	Initiating/Condition
GENERAL	1,2, 3,4	**Prolonged loss of Offsite and Onsite AC power** *(1 and 2)* 1. 1A **and** 1B 6.9KV Shutdown Boards de-energized for >15 minutes 2. *(a or b)* a. Core Cooling Red or Orange b. Restoration of Either 1A or 1B 6.9KV Shutdown Board(s) is not likely within 4 hours of loss.
SITE	1,2, 3,4	**Loss of Offsite and Onsite AC Power > 15 minutes** 1. 1A **and** 1B 6.9KV Shutdown Boards de-energized for >15 minutes
ALERT	1,2, 3,4	**Loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C **and** D CSSTs not available for >15 minutes 2. 1A **or** 1B Diesel Generator not available
UNUSUAL EVENT	1,2 3,4	**Loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C **and** D CSSTs not available for >15 minutes 2. Each Diesel Generator is supplying power to its respective Shutdown Board

3.2 Loss of AC (Shutdown)	
Mode	Initiating/Condition
	Not Applicable
	Not Applicable
5,6, or De-fuel	**UNPLANNED loss of Offsite and Onsite AC power for >15 minutes** 1. 1A **and** 1B 6.9KV Shutdown Boards de-energized for >15 minutes *Also Refer to "Loss of Shutdown Systems" (6.1)*
5,6, or De-fuel	**UNPLANNED loss of Offsite Power for >15 minutes** *(1 and 2)* 1. C **and** D CSSTs not available for >15 minutes 2. Either Diesel Generator is supplying power to its respective Shutdown Board

LOSS OF POWER U1

3.3 Loss of DC Power

	Mode	Initiating/Condition
GENERAL		*Refer to "Fission Product Barrier Matrix" and "Loss of Function" (2.2)*
SITE	1,2, 3,4	**Loss of All Vital DC Power for >15 minutes** 1. Voltage <105V DC on 125V DC Vital Battery Buses 1-I and 1-II and 1-III and 1-IV for >15 minutes *Also Refer to "Fission Product Barrier Matrix", "Loss of Function" (2.2), and "Loss of Instrumentation" (2.1)*
ALERT		*Also Refer to "Fission Product Barrier Matrix", "Loss of Function" (2.2), and "Loss of Instrumentation" (2.1)*
UNUSUAL EVENT	5,6, or De-fuel	**UNPLANNED Loss of the Required Train of DC power for >15 minutes** *(1 or 2)* 1. Voltage <105V DC on 125V DC Vital Battery Buses 1-I and 1-III for >15 minutes 2. Voltage <105V DC on 125V DC Vital Battery Buses 1-II and 1-IV for >15 minutes

08/2010 Watts Bar SRO NRC License Exam
09/22/2010

#	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

08/2010 Watts Bar SRO NRC License Exam
09/22/2010

#	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
76	022 AA2.04 676	1.00	MCS	A
77	025 AA2.03 577	1.00	MCS	B
78	027 AA2.09 678	1.00	MCS	C
79	056 AG2.4.41 379	1.00	MCS	B
80	065 G.2.4.21 380	1.00	MCS	D
81	W/E11 EG2.1.30 281	1.00	MCS	C
82	005 AG2.1.32 382	1.00	MCS	A
83	024 AA2.03 983	1.00	MCS	A
84	060 AG2.4.3 184	1.00	MCS	A
85	061 AA2.01 485	1.00	MCS	C
86	003 A2.01 186	1.00	MCS	D
87	005 A2.01 187	1.00	MCS	C
88	013 G2.2.12 188	1.00	MCS	D
89	059 A2.03 289	1.00	MCS	C

08/2010 Watts Bar SRO NRC License Exam
09/22/2010

#	ID	Points	Type	Answers
90	078 G2.4.4 290	1.00	MCS	B
91	034 K5.03 791	1.00	MCS	A
92	041 A2.03 192	1.00	MCS	D
93	079 G2.1.20 193	1.00	MCS	C
94	G 2.1.21 94	1.00	MCS	A
95	G 2.1.8 195	1.00	MCS	C
96	G 2.2.43 696	1.00	MCS	D
97	G 2.2.7 197	1.00	MCS	B
98	G 2.3.15 98	1.00	MCS	D
99	G 2.3.5 499	1.00	MCS	D
100	G 2.4.44 700	1.00	MCS	B
SECTION 1 (100 items)		**100.00**		