U.S. Nuclear Regulatory Commission

Site-Specific SRO Written Examination

Applicant Information

Name:	
Date: September 19, 2012	Facility/Unit: North Anna Units 1 & 2
Region: I ☐ II ☒ III ☐ IV ☐	Reactor Type: W ☒ CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent 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	75 / 25 / 100	Points
Applicant's Scores	____ / ____ / ____	Points
Applicant's Grade	____ / ____ / ____	Percent

NAPS 2012 NRC SRO EXAM

1. Given the following conditions:
   - Unit 1 is at 80% power
   - Control bank "D" is at 190 steps with rods in AUTO
   - Median-Hi Select Tave 1-RC-TI-1408A fails LOW

   As a result of this malfunction reactor power will ____(1)____ and the OTΔT setpoint will ____(2)____.

   (Consider the **initial** plant response **prior to** any actions occurring to terminate the rod motion)

   A. (1) increase
      (2) decrease

   B. (1) increase
      (2) increase

   C. (1) decrease
      (2) decrease

   D. (1) decrease
      (2) increase

2. Unit 1 was initially at 100% power.

   Operators tripped the reactor due to decreasing Pressurizer pressure & level.

   The crew is implementing 1-E-3, Steam Generator Tube Rupture, and is at Step 12a, "Determine required core exit temperature based on SG pressure".

   Plant conditions are as follows:
   - RCS pressure is 1270 psig and stable
   - RCS Hot Leg Temperatures are 546°F and stable
   - RCS Cold Leg Temperatures are 545°F and stable
   - Core Exit TCs are 556°F and stable
   - "A" train ICCM Subcooling is 20°F and stable
   - "B" train ICCM Subcooling is 30°F and stable

   Based on these plant conditions, the OATC should inform the US that _____ train ICCM indication is **INCORRECT** and _____.

   A. "A" ; leave RCPs running

   B. "A" ; stop all RCPs

   C. "B" ; leave RCPs running

   D. "B" ; stop all RCPs

3. Unit 1 is at 100% power.

   The OATC receives annunciator C-G7, RCP 1A-B-C Seal Leak Hi Flow, and determines that seal leak-off flow for 1-RC-P-1A is pegged high.

   The crew enters 1-AP-33.1, Reactor Coolant Pump Seal Failure.

   Which ONE of the following 1-RC-P-1A indications is used to validate this condition in accordance with 1-AP-33.1 and states a correct required action in accordance with 1-AP-33.1?

   A. Seal Injection flow ; begin an orderly shutdown and stop 1-RC-P-1A

   B. Seal Injection flow ; trip the reactor and stop 1-RC-P-1A

   C. Thermal Barrier temperature; begin an orderly shutdown and stop 1-RC-P-1A

   D. Thermal Barrier temperature; trip the reactor and stop 1-RC-P-1A

4. Operators have just finished synchronizing Unit 1 to the grid following a scheduled refueling outage.

   1-RC-P-1B, "B" Reactor Coolant Pump trips.

   Which ONE of the following identifies how "B" SG level will **initially** respond to this transient, and also correctly states whether a manual reactor trip is required?

   A. decrease ; manual Reactor trip is **NOT** required

   B. decrease ; manual Reactor trip is required

   C. increase ; manual Reactor trip is **NOT** required

   D. increase ; manual Reactor trip is required

5. Which ONE of the following identifies the sources of power to the "A" Boric Acid Storage Tank heaters and includes how the heaters respond in the event of a loss of offsite power?

   A. 1H and 1J emergency Busses ; automatically restored when the EDG energizes its associated Emergency Bus

   B. 1H and 1J emergency Busses ; must be manually reset after the EDG energizes its associated Emergency Bus

   C. 2H and 1J emergency Busses ; automatically restored when the EDG energizes its associated Emergency Bus

   D. 2H and 1J emergency Busses ; must be manually reset after the EDG energizes its associated Emergency Bus

6. Both Units are at 100%.

   Burnup on Unit 1 is 3,000 MWD/MTU
   Burnup on Unit 2 is 12,500 MWD/MTU

   Which one of the following correctly completes the following statement?

   The moderator temperature coefficient is more negative on ____(1)____, and if power is lowered to 90% on both units by boration only, then ____(2)____ will require a larger boration than the other unit.

   A. (1) Unit 1
      (2) Unit 1

   B. (1) Unit 1
      (2) Unit 2

   C. (1) Unit 2
      (2) Unit 1

   D. (1) Unit 2
      (2) Unit 2

7. Initial Conditions:
   - Unit 1 is in Mode 6 following a refueling outage.
   - All 157 fuel assemblies were replaced with new assemblies
   - Reactor vessel level is 74" above centerline and head bolt tensioning is in progress.
   - VCT float is in service.

   The running RHR pump trips.

   Which of the following choices (1) identifies the effect, if any, this malfunction will have on Reactor Vessel level and (2) whether or not pump venting is required in accordance with 1-AP-11, Loss of RHR prior to placing the standby RHR pump in service?

   A. (1) reactor vessel level remains constant
      (2) RHR pump venting IS required prior to placing the standby RHR pump in service

   B. (1) reactor vessel level remains constant
      (2) RHR pump venting IS **NOT** required prior to placing the standby RHR pump in service

   C. (1) reactor vessel level increases
      (2) RHR pump venting IS required prior to placing the standby RHR pump in service

   D. (1) reactor vessel level increases
      (2) RHR pump venting IS **NOT** required prior to placing the standby RHR pump in service

8. Given the following conditions on Unit 1:

- The RCS is solid
- RCS pressure is stable at 350 psig
- RCS temperature is stable
- RHR is in service and supplying letdown
- Letdown orifice HCVs are closed
- Charging flow control valve 1-CH-FCV-1122 is set at 30% demand in MANUAL
- RHR to letdown isolation valve 1-CH-HCV-1142 is set at 50% demand
- Letdown pressure control valve 1-CH-PCV-1145 is set at 50% demand in MANUAL

Which of the choices below correctly completes the following statements?

If the air line separates from the 1-CH-HCV-1142 actuator, RCS pressure will _____(1)_____.
AND
If the air line separates from the 1-CH-FCV-1122 actuator, RCS pressure will _____(2)_____.

(Consider each failure independently)

A. Increase ; Increase

B. Increase ; Decrease

C. Decrease ; Increase

D. Decrease ; Decrease

9. Operators are responding to a large break LOCA.

   RWST level is 40% and decreasing.

   Which ONE of the following identifies the **setpoint** at which automatic swap-over to the Containment sump should occur, and describes how a failure of 1-SI-MOV-1885A, Low-Head SI Pump Recirc Valve, to reposition would effect the swapover?
   (1-SI-MOV-1885B, C and D repositioned as designed)

   A. 16% ; 1-SI-MOV-1860A, Low-Head SI Pump Suction from Containment Sump **WILL NOT** automatically open

   B. 16% ; 1-SI-MOV-1860A, Low-Head SI Pump Suction from Containment Sump **WILL** automatically open

   C. 23% ; 1-SI-MOV-1860A, Low-Head SI Pump Suction from Containment Sump **WILL NOT** automatically open

   D. 23% ; 1-SI-MOV-1860A, Low-Head SI Pump Suction from Containment Sump **WILL** automatically open

10. Unit 1 tripped from 100% power due to a spurious Safety Injection signal.

    The Crew is implementing 1-E-0, Reactor Trip or Safety Injection and the OATC has just taken the SI RESET switches to RESET.

    Which ONE of the following identifies the effect that Train "A" Safety Injection **failing to reset** would have on subsequent recovery actions?

    A. Placing 1-CH-P-1A in P-T-L will stop the pump ; Train "A" of Phase "A" **CANNOT** be reset

    B. Placing 1-CH-P-1A in P-T-L will stop the pump ; Train "A" of Phase "A" CAN be reset

    C. Placing 1-CH-P-1A in P-T-L will **NOT** stop the pump ; Train "A" of Phase "A" CAN be reset

    D. Placing 1-CH-P-1A in P-T-L will **NOT** stop the pump ; Train "A" of Phase "A" **CANNOT** be reset

11. Given the following:

Unit 1 was initially at 100% power.

Bistables for 1-RC-PT-1455, PRZR Pressure Protection Channel I, are in trip for the PT.

A loss of 1-III Vital AC Bus occurs.

The Crew has just completed the Immediate Actions of 1-E-0, Reactor Trip or Safety Injection.

Based on these plant conditions 1-CH-MOV-1381, RCP Seal Return Isolation, remained open because of the loss of _____ and RCP # 1 Seal Return is flowing to the _____.

A. power to the MOV ; PDTT

B. power to the MOV ; PRT

C. power to Train "B" Safeguards slave relays ; PDTT

D. power to Train "B" Safeguards slave relays ; PRT

12. Given the following conditions:

Operators tripped Unit 1 from 100% power due to a stuck open PRZR Safety Valve.

- The crew is performing the actions of 1-ES-1.2, Post LOCA Cooldown and Depressurization.
- Both LHSI pumps have been stopped.
- One charging pump has been stopped.
- Normal charging has been re-aligned.
- RCPs are OFF.
- The crew is on Step 21, "Depressurize RCS to minimize break flow".
- The depressurization was stopped when subcooling reached 35°F

The following conditions exist:

- RCS subcooling is 23°F and trending DOWN.

Based on these indications, what action will be taken in accordance with 1-ES-1.2?

A. Manually start charging pumps and align the BIT

B. Start one RCP

C. Manually actuate SI

D. Increase RCS cooldown rate

13. Both Units are at 100%.

- 1-CC-P-1A is tagged and uncoupled for maintenance
- 2B CC Hx has been valved out for temperature control due to colder weather conditions

The CC System is required by Tech Specs _____; based on these plant conditions the LCO is _____.

A. to provide accident mitigation for a Steam the Generator Tube Rupture ; MET

B. to provide accident mitigation for a Steam the Generator Tube Rupture ; NOT MET

C. to cooldown one unit quickly while the other unit is operating should the need arise ; MET

D. to cooldown one unit quickly while the other unit is operating should the need arise ; NOT MET

14. Unit 1 was initially at 100% power.

The OATC tripped the reactor due to decreasing PRZR Level and Pressure.

Offsite power was lost shortly after the trip.

The crew is currently preforming 1-ES-1.2, Post LOCA Cooldown and depressurization, Step 13, "depressurize the RCS to refill the PRZR"

Plant conditions prior to starting depressurization were:
- PRZR Level 4% and stable
- RCS Subcooling 40°F and slowly increasing
- Core exit TCs 532°F and slowly decreasing

While depressurizing, the OATC notes the following conditions:
- PRZR Level 40% and increasing rapidly
- RCS Subcooling -5°F and slowly decreasing
- Core exit TCs 530°F and slowly decreasing

Given the current conditoins, which one of the choices below correctly answers the following questions?

(1) What is the method used for depressurization IAW 1-ES-1.2?
AND
(2) Can depressurization continue IAW 1-ES-1.2?

A. (1) Auxilliary Spray
(2) Depressurization can continue

B. (1) Auxilliary Spray
(2) Depressurization can **NOT** continue

C. (1) PORV
(2) Depressurization can continue

D. (1) PORV
(2) Depressurization can **NOT** continue

15. Unit 1 is at 100% power.

    1-RC-PT-1456, PRZR Pressure Protection Channel II, failed high and 1-MOP-55.73, Pressurizer Pressure Protection Instrumentation, has been implemented, but bistables have **NOT** been placed in trip yet.

    A loss of 1-I Vital 120VAC Bus occurs.

    Based on these plant conditions an automatic reactor trip _____ occur and automatic Pressurizer Pressure Control is _____.

    A. will not ; available

    B. will not ; **NOT** available

    C. will ; available

    D. will ; **NOT** available

16. Given the following:
    - Unit 1 is in Mode 3 following a scheduled refueling outage.
    - 1-OP-1.4, Unit Startup from Mode 4 to Mode 3 is in progress
    - The crew is heating up the RCS and raising RCS pressure
    - RCS pressure is 700 psig
    - RCS temperature is 375°F
    - All letdown orifices isolation valves are open

    The following alarms are received:
    - C-B3, REGEN HX LETDWN LINE HI TEMP
    - C-B4, LO PRESS LETDWN LINE HI FLOW

    Which ONE of the following identifies the cause of these alarms and includes the corrective action the operator should take?

    A. inadequate charging flow ; place 1-CH-FCV-1122, Charging Flow Control Valve in MANUAL and increase charging

    B. inadequate charging flow ; isolate Normal Letdown

    C. excessive letdown flow ; place 1-CH-PCV-1145, Letdown Pressure Control Valve in MANUAL and fully close the valve

    D. excessive letdown flow ; close one letdown orifice isolation valve

17. Unit 1 was operating at 100%.

A Large Break LOCA occurred at time 12:00.

The crew has completed 1-ES-1.3, Transfer to Cold Leg Recirc.

1-E-1, Loss of Reactor or Secondary Coolant, will direct the crew to go to 1-ES-1.4, Transfer to Hot Leg Recirculation, _____ after event initiation; the reason for this action is to _____.

A. 4.5 hours ; preclude boron precipitation which could potentially hinder core cooling

B. 4.5 hours ; preclude accelerated localized corrosion of cladding in the upper regions of the core

C. 5 hours ; preclude boron precipitation which could potentially hinder core cooling

D. 5 hours ; preclude accelerated localized corrosion of cladding in the upper regions of the core

18. Unit 1 just cleared a Chemistry hold at 30% power and is ramping to 100% power following a scheduled refueling.

    Which of the choices below completes the following statement?

    As the Unit is ramped up the OATC should expect the _____(1)_____**SETPOINT** to change, and _____(2)_____ is the input that has the largest impact on this setpoint over the course of the ramp.

    A. (1) OPΔT
       (2) axial flux

    B. (1) OPΔT
       (2)Tave

    C. (1)OTΔT
       (2)axial flux

    D. (1)OTΔT
       (2)Tave

19. Unit 1 is at 100% power.

Containment Pressure Protection Channel II (1-LM-P-100B) failed on the previous shift and all bistables have been positioned in accordance with 1-MOP-55.75, Containment Pressure Protection Instrument.

Which ONE of the following is true concerning a subsequent Containment Pressure Channel failure?

A. If 1-LM-P-100A, Containment Pressure Protection Channel I, fails high, CDA will actuate. Safety Injection and Main Steam Line Isolation will **NOT** actuate.

B. If 1-LM-P-100C, Containment Pressure Protection Channel III, fails high, Safety Injection and Main Steam Line Isolation will actuate. CDA will **NOT** actuate.

C. If 1-LM-P-100D, Containment Pressure Protection Channel IV, fails high, CDA, Safety Injection and Main Steam Line Isolation will actuate.

D. A failure high of any one of the remaining Containment Pressure Protection Channels will **NOT** cause an ESF actuation.

20. A Reactor Startup is in progress on Unit 1.

Unit 1 is at 1.1E-8 AMPs and stable.

The OATC has just completed recording critical data.

Annunciator A-G2, RPI Rod Bot Rod Drop, is received and the OATC observes that Rod Bottom Lights are ON for Rods D4 and M12, and the IRPIs for both indicate 0 steps.

Based on the above, select the choice that,
1) identifies the parameter that is the best to use to differentiate between an actual dropped rod condition versus an IRPI malfunction,
and
2) includes the required operator action assuming the parameter has changed?

A. 1) RCS Tave
   2) manually insert all control banks

B. 1) RCS Tave
   2) trip the reactor

C. 1) Intermediate Range SUR
   2) manually insert all control banks

D. 1) Intermediate Range SUR
   2) trip the reactor

21. Select the choice that completes the following statement.

The instrumentation used to derive the Train "A" ICCM Subcooling display are RCS Wide Range Pressure and _____ ; assuming all temperature instruments are reading 550°F, if a single temperature element in that train fails low the subcooling indication will _____.

A. core exit thermocouples ; decrease

B. core exit thermocouples ; **NOT** change

C. RCS Wide Range Hot Leg RTDs ; decrease

D. RCS Wide Range Hot Leg RTDs ; **NOT** change

22. Unit 1 is at 50% power.

The crew is recovering from a failure of the selected Pressurizer Level Transmitter. Operable PRZR level channels have been selected.

1-CH-FCV-1122, Charging Flow Control Valve, is in manual.

Current conditions are:

- PRZR level is 50% and stable
- RCS Tave is 564°F and stable
- 1-RC-LC-1459G, Pressurizer Level Controller, is in manual with output at 10%

Based on the currect conditions, which one of the following describes the system status and the action required by 1-AP-3, Loss of Vital Instrumentation, to restore PRZR level control to automatic?

A. PRZR level is below program; increase charging to restore PRZR level to program, adjustment of 1-RC-LC-1459G is required prior to placing 1-CH-FCV-1122 in automatic.

B. PRZR level is below program; increase charging to restore PRZR level to program, adjustment of 1-RC-LC-1459G is **NOT** required prior to placing 1-CH-FCV-1122 in automatic.

C. PRZR level is above program; decrease charging to restore PRZR level to program, adjustment of 1-RC-LC-1459G is required prior to placing 1-CH-FCV-1122 in automatic.

D. PRZR level is above program; decrease charging to restore PRZR level to program, adjustment of 1-RC-LC-1459G is **NOT** required prior to placing 1-CH-FCV-1122 in automatic.

23. Unit 1 is at 100% power.

The Mechanical Chiller has tripped and cannot be re-started.

As a result the crew should expect that over time the **indicated** partial pressure will ____(1)____ and the crew will restore a source of cooling water in accordance with 1-AP-35, Loss of Containment Air Recirculation Cooling, by aligning ____(2)____ to Containment Air Recirc Fans.

A. (1) increase
(2) CC

B. (1) increase
(2) Service Water

C. (1) decrease
(2) CC

D. (1) decrease
(2) Service Water

24. Unit 1 is cooling down for a scheduled refueling.

The crew has just completed placing RHR in service.

1-RH-P-1B and 1-CC-P-1B are running.

1-RH-P-A and 1-CC-P-1A are in standby with the control switches in AUTO-AFTER-STOP.

A lightning strike results in a loss of the "A" RSST.

All remaining equipment functions as designed.

With no operator action, 1 minute after the loss of the "A" RSST the Unit 1 OATC should expect that there will be _____ RHR pump(s) running and _____ Unit 1 CC pump(s) running.

A. 0 ; 1

B. 0 ; 2

C. 1 ; 1

D. 1 ; 2

25. Select the choice that completes the following description of the Recirc Spray Sub-systems.

In the event of a Design Basis Loss of Coolant Accident, when RWST level reaches 60%, the ____(1)____ Recirc Spray Pumps will start following a two minute time delay; NPSH to these pumps is increased by the operation of the ____(2)____ pumps.

A. (1) Inside
(2) Casing Cooling

B. (1) Inside
(2) Quench Spray

C. (1) Outside
(2) Casing Cooling

D. (1) Outside
(2) Quench Spray

26. Unit 1 is at 100% power.

1-RC-PT-1444, PRZR Pressure Control Transmitter fails HIGH

As a result of the failure, the demand on 1-RC-PC-1444J, Master Pressure Controller, will _____ and in accordance with 1-AP-44, Loss of Reactor Coolant System Pressure, the OATC will place 1-RC-PC-1444J in MANUAL and depress the _____ pushbutton.

A. increase ; lower

B. increase ; raise

C. decrease ; raise

D. decrease ; lower

27. According to the System Design Basis Document, the Containment Iodine Filtration Fans are powered from ____(1)____ and are placed in operation to ____(2)____.

A. (1) Emergency Busses
(2) reduce airborne radioactivity in Containment prior to opening Containment for a normal refueling outage.

B. (1) Emergency Busses
(2) minimize release during a postulated fuel handling accident inside Containment.

C. (1) Station Service Busses
(2) reduce airborne radioactivity in Containment prior to opening Containment for a normal refueling outage.

D. (1) Station Service Busses
(2) minimize release during a postulated fuel handling accident inside Containment.

28. Unit 1 was initially at 100% power

A load rejection occurred causing a PRZR Safety to lift and stick open.

The reactor tripped and SI actuated.

Current plant conditions are:
- Subcooling on Train "A" & Train "B" ICCMs is 50°F and decreasing
- The PRZR Safety is still stuck open
- PRT pressure is 80 psig and increasing

Based on the current plant conditions, which of the following choices:

(1) identifies whether or not RCPs are required to be tripped IAW 1-E-0, Reactor Trip or Safety Injection, **AND**
(2) how PRZR level will respond during the performance of 1-E-0.

A. (1) tripping all RCPs is **NOT** required
(2) PRZR level will decrease

B. (1) tripping all RCPs is **NOT** required
(2) PRZR level will increase

C. (1) tripping all RCPs is required
(2) PRZR level will decrease

D. (1) tripping all RCPs is required
(2) PRZR level will increase

29. Given that Containment Purge is in-service on Unit 1.

Which ONE of the following identifies the two items that can cause automatic isolation of the Containment Purge?

A. 1-RM-RMS-159, Containment Particulate Radiation Monitor Hi-Hi alarm.
Manual Actuation of Containment Isolation Phase A.

B. 1-RM-RMS-162, Manipulator Crane Radiation Monitor Hi-Hi alarm.
1-VG-RI-180-1, MGP Vent Stack B Rad monitor Hi alarm.

C. 1-RM-RMS-159, Containment Particulate Radiation Monitor Hi-Hi alarm.
1-RM-RMS-162, Manipulator Crane Radiation Monitor Hi-Hi alarm.

D. Manual Actuation of Containment Isolation Phase A.
1-VG-RI-180-1, MGP Vent Stack B Rad monitor Hi alarm.

30. Unit 1 was initially at 100% power when the following sequence of events occurred:

- "A" Main Steam Trip Valve drifted closed causing a Safety Injection
- The OATC notes that the Reactor Trip breakers failed to open and manually trips the reactor.
- All equipment functions as designed **EXCEPT** "B" Reactor Trip Breaker failed to open.
- The OATC momentarily places both SI reset switches in RESET per the applicable EOP

Based on the above sequence of events, which of the following choices correctly states

(1) the status of SI reset
AND
(2) the status of SI automatic initiation

A. (1) ONLY the "A" train of SI is reset
(2) ONLY the "A" train of SI automatic initiation is blocked

B. (1) ONLY the "A" train of SI is reset
(2) BOTH trains of SI automatic initiation are blocked

C. (1) BOTH trains of SI are reset
(2) ONLY the "A" train of SI automatic initiation is blocked

D. (1) BOTH trains of SI are reset
(2) BOTH trains of SI automatic initiation are blocked

31. Which ONE of the following identifies the correct differential pressure limit across the SG U-tubes?

    A. 1600 psid primary-to-secondary

    B. 600 psid primary-to-secondary

    C. 670 psid secondary-to-primary

    D. 1085 psid secondary-to-primary

32. The following conditions exist:

- A SGTR has occurred on Unit 2
- The RCS cooldown is complete and the crew is preparing to depressurize the RCS in accordance with 2-E-3, Steam Generator Tube Rupture.

Which ONE of the following describes the reason for the RCS depressurization?

A. Increases SI flow to increase RCS inventory while decreasing the amount of leakage to the ruptured SG.

B. Allows backflow of the ruptured steam generator into the RCS minimizing contamination levels in the generator.

C. Prevent lifting a SG safety valve.

D. Ensures there will be no release of radioactivity through the ruptured SG PORV for the duration of the event.

33. Unit 1 was initially at 100% when a Loss of Coolant Accident (LOCA) occurred.

Subsequent to the LOCA a loss of offsite power occurred.

Unit 1 is now on Cold Leg Recirc and the crew is performing 1-E-1, Loss of Reactor or Secondary Coolant.

The crew is at 1-E-1, Step 24, "Check if intact SGs should be depressurized to RCS pressure"

In accordance with 1-E-1 and it's background document, which one of the choices below correctly completes the following statement?

The depressurization will be performed using the ____(1)____
AND
the depressurization ____(2)____ performed to aid in further cooldown and depressurization of the RCS.

A. (1) condenser Steam Dumps
(2) is

B. (1) condenser Steam Dumps
(2) is **NOT**

C. (1) SG PORVs
(2) is

D. (1) SG PORVs
(2) is **NOT**

34. Operators are performing 1-ECA-2.1, Uncontrolled Depressurization of ALL Steam Generators.

Containment pressure is 26 psia and slowly decreasing.

SG NR Levels are:
- SG "A" is 18%
- SG "B" is 19%
- SG "C" is 20%

Which of the choices below completes the following statements?

IAW the CAUTION prior to Step 2 of 1-ECA-2.1 and the current plant conditions. a MINIMUM AFW flow of 100 gpm ___(1)___ required to be supplied to each SG; the reason for this requirement is _____(2)_____.

A. (1) is
(2) preclude water hammer if feed flow is subsequently increased to control RCS temperature

B. (1) is
(2) minimize thermal stresses if feed flow is subsequently increased to control RCS temperature

C. (1) is **NOT**
(2) preclude water hammer if feed flow is subsequently increased to control RCS temperature

D. (1) is **NOT**
(2) minimize thermal stresses if feed flow is subsequently increased to control RCS temperature

35. Which ONE of the following identifies (1) how main steam header pressure responds as turbine load is raised from 25% to 65%, and (2) how Moderator Temperature Coefficient (MTC) will change as boron concentration is decreased during the ramp?

A. (1) Main steam header pressure rises.
(2) MTC becomes more negative.

B. (1) Main steam header pressure rises.
(2) MTC becomes less negative.

C. (1) Main steam header pressure lowers.
(2) MTC becomes more negative.

D. (1) Main steam header pressure lowers.
(2) MTC becomes less negative.

36. Unit 1 was initially at 100% power with Auxiliary Feedwater Pump 1-FW-P-3A tagged out.

A spurious Safety Injection occurred and all equipment functioned properly except:
- Auxiliary Feedwater Pump 1-FW-P-2 oversped and tripped when starting up
- Auxiliary Feedwater Pump 1-FW-P-3B shaft sheared when starting up

Operators are implementing 1-E-0, Reactor Trip or Safety Injection, and are at step 7, "Verify AFW Flow"

Current plant conditions are:
- "A" SG WR level - 45%, slowly lowering
- "B" SG WR level - 42%, slowly lowering
- "C" SG WR level - 44%, slowly lowering

Based on the current plant conditions, transition to 1-FR-H.1, Loss of Secondary Heat Sink, is _____ and _____.

A. required ; bleed and feed criteria is **NOT** met

B. required ; bleed and feed criteria is met

C. NOT required ; Enter H.1 ONLY after exiting E-0

D. NOT required ; Enter H.1 ONLY when directed by E-0

37. Given the following plant conditions:
    - Unit 2 has experienced a Loss of All AC power.
    - The crew has initiated 0-OP-6.4, Operation of the SBO Diesel (SBO Event)
    - The US has directed the SBO operator to energize 2H Emergency Bus

    Based on the above plant conditions, the SBO operator will energize _____ and place the interlock defeat switch for the Feeder breaker to 2H Bus in SBO, in order to allow this Feeder breaker to be closed with breaker _____.

    A. "L" 4160v Bus ; 05L1 closed

    B. "L" 4160v Bus ; 15E1 open

    C. "M" 4160v Bus ; 05L1 closed

    D. "M" 4160v Bus ; 15E1 open

38. Given the following conditions:
    - Unit 1 is at 35% power ramping up following a scheduled refueling
    - The Turbine Operator reports that one of the Condenser Air Ejector Loop Seal Drain lines feels hot to the touch
    - The OATC notes that Condenser pressure is 3 in Hg abs and slowly degrading
    - The crew has entered 1-AP-14, Loss of Condenser Vacuum, and commenced a ramp down at 2%/minute.

    5 minutes after starting the 2%/minute ramp down the OATC reports the following:
    - Condenser pressure is 4 in Hg abs and stable
    - Tave is 557°F
    - Tref is 556°F

    Based on the OATC report, which ONE of the following identifies the action required IAW 1-AP-14?

    A. Trip the Turbine and go to 1-AP-2.1, Turbine Trip Without Reactor Trip.

    B. Continue the ramp until condenser pressure is 3.5 in Hg abs or less.

    C. Trip the Reactor and go to 1-E-0, Reactor Trip or Safety Injection.

    D. Hold the ramp and place Rods in MANUAL.

39. Unit 1 tripped from 100% due to a loss of offsite power.

Plant conditions are as follows:

- PRZR Pressure is 2100 psig and slowly increasing
- PRZR level is 38% and slowly increasing
- RCS Tavg is 552°F and stable

The immediate actions of 1-E-0, Reactor Trip or Safety Injection have been completed, but no other operator actions have been taken.

Which of the choices below;

(1) identifies the current status of Group 1 and Group 4 PRZR Heaters
AND
(2) correctly states the required capacity of Pressurizer Heaters IAW LCO 3.4.9, Pressurizer.

A. (1) energized
(2) Two groups of pressurizer heaters with the capacity of each group ≥ 125 KW

B. (1) energized
(2) Two groups of pressurizer heaters with the capacity of each group ≥ 250 KW

C. (1) de-energized
(2) Two groups of pressurizer heaters with the capacity of each group ≥ 125 KW

D. (1) de-energized
(2) Two groups of pressurizer heaters with the capacity of each group ≥ 250 KW

40. Unit 1 is at 12% power preparing to go on-line.

Several annunciators are received and the BOP reports a loss of Vital 120VAC Bus 1-III.

Which ONE of the following identifies the **immediate** impact of the loss of Vital 120VAC Bus 1-III?

A. Condenser steam dumps will close but can be opened by placing the controller in MANUAL ; outward rod motion is possible

B. Condenser steam dumps will close but can be opened by placing the controller in MANUAL ; outward rod motion is **NOT** possible

C. Condenser steam dumps will close and **CANNOT** be opened from the control room ; outward rod motion is possible

D. Condenser steam dumps will close and **CANNOT** be opened from the control room ; outward rod motion is **NOT** possible

41. Given the following conditions:

- Unit 1 is at 100% power
- 125VDC bus 1-I is lost due to a grounded cable

Which ONE of the following describes the effect of this malfunction on the 1H EDG?

A. The EDG excitation circuit is unaffected;
The EDG output breaker can be closed from the control room

B. The EDG excitation circuit is unaffected;
The EDG output breaker **CANNOT** be closed from the control room

C. The EDG excitation circuit is de-energized;
The EDG output breaker can be closed from the control room

D. The EDG excitation circuit is de-energized;
The EDG output breaker **CANNOT** be closed from the control room

42. Unit 1 is at 25% power.

Feed Control has been transfered to the Main FRVs and all 3 are in automatic.

Assuming NO operator action is taken, which ONE of the following malfunctions would result in AFW automatically starting **PRIOR** to the reactor automatically tripping?

A. "A" SG controlling level channel fails high

B. "A" SG controlling steam pressure channel fails low

C. Feed back arm falls off "A" Main FRV

D. "A" Main FRV fails closed

43. Fuel movement is in progress in the Fuel Building and the fuel handlers report that an assembly has been dropped and appears to be damaged.

A Hi Alarm is received on 1-RM-RMS-153, Fuel Pit Bridge Radiation Monitor.

Which ONE of the following identifies the corrective action to be taken by the Control Room crew in accordance with 0-AP-5.1, Common Unit Radiation Monitoring System, and includes the recorder that is used to monitor the effectiveness of that action?

A. isolate fuel building ventilation to stop or reduce release ; 1-RM-RR-179, MGP Vent Stack A

B. isolate fuel building ventilation to stop or reduce release ; 1-RM-RR-180, MGP Vent Stack B

C. place fuel building exhaust through the charcoal filters ; 1-RM-RR-179, MGP Vent Stack A

D. place fuel building exhaust through the charcoal filters ; 1-RM-RR-180, MGP Vent Stack B

44. Unit 1 tripped spuriously from 100% power.

Operators have transitioned to 1-ES-0.1, Reactor Trip Response.

The crew has just completed throttling AFW per 1-ES-0.1.

If the **pressure sensing line** for 1-FW-PCV-159B were inadvertently severed, AFW flow to the _____.

A. "B" SG will decrease

B. "B" SG will increase

C. "C" SG will decrease

D. "C" SG will increase

45. Unit 1 is in Mode 3.

Severe thunder storms are causing large swings in grid voltage and frequency.

Operators are responding to a spurious SI and have just completed Step 5 of 1-E-0, Reactor Trip or Safety Injection.

The 1J bus voltage has taken a step change from 4000 volts to 3700 volts.

The OATC should expect bus stripping to occur _____ after the degraded voltage condition occurs and as a result _____.

A. 2 seconds ; 1-CH-P-1B breaker opens and then re-closes once the EDG restores power to the bus.

B. 2 seconds ; 1-CH-P-1B breaker remains closed throughout the event.

C. 7.5 seconds ; 1-CH-P-1B breaker opens and then re-closes once the EDG restores power to the bus.

D. 7.5 seconds ;1-CH-P-1B breaker remains closed throughout the event.

46. Unit 1 is at 100% power.

The OATC receives FW < STM Flow alarms on all three SGs

The OATC notes that both the red and green position indicator lights are OFF on all three MFRVs

A possible cause of these indications is a breaker has tripped on the _____ .

A. 1-III AC Bus

B. 1-IV AC Bus

C. 1-III DC Bus

D. 1-IV DC Bus

47. Unit 1 is at 100% power.

The crew is performing 1-PT-82H, 1H EDG Slow-Start Test and are slowly raising load on the EDG.

Current conditions are:
- EDG load is 800 KW.
- Reactive load is 0 KVAR.

A loss of off-site power (LOOP) occurs.

Once all automatic actions have taken place, the EDG operator should expect to see that real load has _____ and reactive load has _____?

(Assume no actions are taken by the EDG operator in response to the transient)

A. increased ; remained the same

B. increased ; increased

C. decreased ; remained the same

D. decreased ; increased

48. In accordance with Technical Specifications, for a Loss of Offsite Power the EDG shall energize its associated Emergency Bus in less than or equal to _____ and all automatic trips are bypassed **EXCEPT** for _____.

A. 10 seconds ; Overspeed ONLY

B. 10 seconds ; Overspeed AND Generator Differential

C. 12 seconds ; Overspeed ONLY

D. 12 seconds ; Overspeed AND Generator Differential

49. Given both Units at 100% power.

A fire has been confirmed in the Unit 1 Cable Vault and the crew is implementing 1-FCA-3, Cable Vault and Tunnel Fire.

1-FCA-3, will direct the crew to _____ **AND** the type of fire protection system in the cable vault is _____.

A. Shutdown the Unit using 1-AP-2.2, Fast Load Reduction ; Halon

B. Shutdown the Unit using 1-AP-2.2, Fast Load Reduction ; CO2

C. Manually trip the Unit ; Halon

D. Manually trip the Unit ; CO2

50. Consider the following EDG start signals:

1) Manual Start (Control Room)
2) Automatic Start (Bus Under Voltage Signal)
3) Automatic Start (Safety Injection Signal)

Select the choice that completes the following:

Placing the Control Room Emergency (CRE) switch for an EDG in the EMERG position will **PREVENT** EDG start from_____.

A. 1 & 2 ONLY

B. 2 & 3 ONLY

C. 3 ONLY

D. 1 ONLY

51. Which ONE of the choices below correctly;

(1) states whether the CLOSE pushbuttons for 1-DA-TV-100A & 1-DA-TV-100B, containment sump pump discharge trip valves, must be pushed after resetting phase A isolation in order to restore sump pumping capability
AND
(2) states the tanks to which the containment sump pumps normally discharge?

A. (1) Close pushbuttons are required to be pushed after phase A reset
(2) Low Level Liquid Waste Tanks (LLLW Tanks)

B. (1) Close pushbuttons are required to be pushed after phase A reset
(2) High Level Liquid Waste Tanks (HLLW Tanks)

C. (1) Close pushbuttons are **NOT** required to be pushed after phase A reset
(2) Low Level Liquid Waste Tanks (LLLW Tanks)

D. (1) Close pushbuttons are **NOT** required to be pushed after phase A reset
(2) High Level Liquid Waste Tanks (HLLW Tanks)

52. Annunciators K-D2, RAD MONITOR SYSTEM HI RAD LEVEL, and K-D4, RAD MONITOR SYST HI-HI RAD LEVEL, were received due to 1-RM-LW-111, Clarifier Outlet, failing high.

IAW 0-AP-5.1, Common Unit Radiation Monitoring System, the operator verifies all of the following actions have occurred **EXCEPT**_____?

A. Contaminated Drain Tank pumps tripped

B. 1-LW-PCV-115 (Liquid Waste Tunnel Isol Control) closed

C. Low-Capacity Steam Generator Blowdown pumps tripped

D. 1-LW-FCV-100 (Holdup Tank Influent Valve) closed

53. Given the following conditions:
    - A WGDT release is in progress.
    - 1-GW-RM-178-1, Process Vents Rad Monitor, indication is trending up.

    As 1-GW-RM-178-1 continues to increase, 1-GW-FCV-101, WGDT to Process Vents, will remain open until the _____ alarm is received. Assuming the indication begins trending down at that point and returns to normal, 1-GW-FCV-101 _____.

    A. Hi ; will automatically re-open

    B. Hi ; will **NOT** automatically re-open

    C. Alert ; will automatically re-open

    D. Alert ; will **NOT** automatically re-open

54. Both Units are at 100% power.

1-SW-P-1A was tagged out yesterday for scheduled maintenance

2-SW-P-1B trips and the crew enters 0-AP-12, Loss of Service Water

Based on these plant conditions, _____ will lose Service Water flow, and IAW 0-AP-12, the crew will perform _____ .

A. Unit 1 CC HXs ; Attachment 6, Aligning One SW Pump per Supply Header when NO Pumps are Running on One Header

B. Unit 1 CC HXs ; Attachment 10, Operation of Auxiliary Service Water Pumps

C. Unit 2 CC HXs ; Attachment 6, Aligning One SW Pump per Supply Header when NO Pumps are Running on One Header

D. Unit 2 CC HXs ; Attachment 10, Operation of Auxiliary Service Water Pumps

55. Given the following:
12:00 - Unit 1, 100% power
12:20 - Unit 1, 82% power and stable following a fast ramp due to secondary issues

Which of the choices below correctly completes the following statements?

(1) TS 3.4.16, RCS Specific Activity, requires sampling and analysis of the RCS _____(1)_____.
AND
(2) Sampling is performed to verify reactor coolant Dose Equivalent _____(2)_____ specific activity is less than the limit.

A. (1) anytime within 4 hours of initiating the power change
(2) I-131

B. (1) anytime within 4 hours of initiating the power change
(2) Xe-133

C. (1) between 2 and 6 hours after the power change
(2) I-131

D. (1) between 2 and 6 hours after the power change
(2) Xe-133

56. Both Units are at 100% power.

1-SW-P-1B and 2-SW-P-1B are running.

1-SW-P-1A and 2-SW-P-1A are in standby with the control switches in AUTO-AFTER-STOP.

A spurious Train A SI occurs on Unit 2.

Prior to any operator actions, there will be _____ SW pumps running and SW flow to Unit 2 CC HXs has _____ ?

A. 3 ; decreased

B. 3 ; increased

C. 4 ; decreased

D. 4 ; increased

57. Unit 1 is at 100% power and Unit 2 is in refueling.

A Grid disturbance results in a 10 kV **decrease** in switchyard voltage.

The System Operator requests that you **raise** voltage back to the pre-event value.

Current conditions are:

- Switchyard Voltage 514 KV
- Generator MVARS -100 MVARS

Based on the current conditions, the Offsite Power Source is ____(1)____ and assuming the OATC is using the "adjust and wait" method of raising Switchyard Voltage, after making the first adjustment he should expect Generator MVARS to be ____(2)____.

A. (1) Inoperable
(2) more negative

B. (1) Inoperable
(2) less negative

C. (1) Operable
(2) more negative

D. (1) Operable
(2) less negative

58. Select the choice that completes the description of how instrument air is provided for "B" Main Steam Trip Valve, 2-MS-TV-201B.

Instrument air is supplied to "B" Main Steam Trip Valve, 2-MS-TV-201B, via _____ solenoid operated valves (SOVs), _____ any one of the SOVs will close 2-MS-TV-201B.

A. 2 ; energizing

B. 2 ; de-energizing

C. 6 ; energizing

D. 6 ; de-energizing

59. While at 100% power, which ONE of the following conditions represents a loss of containment integrity IAW Technical Specifications?

A. An operator discovers steam emitting from a pipe-to-body weld on the upstream side of 1-CH-TV-1204B, Reactor Coolant Letdown Line Isolation Valve.

B. An electrician opens the outer containment airlock door to perform maintenance activities without prior approval.

C. While performing an operability test of two normally open redundant containment isolation valves, one of the valves fails to close.

D. The LMC drain line upstream of the containment hogger isolation valve is discovered with the pipe cap missing and the drain valve closed.

60. Unit 1 is at 100% power.

Tags are being cleared on 1-SD-P-1A, A High Pressure Heater Drain Pump.

IAW OP-AA-200, Equipment Clearance, which of the choices below correctly completes the following statements?

The ____(1)_____ pressure side of the pump shall be unisolated first
AND
_____(2)_____ verification shall be used to clear the electrical tags.

A. (1) high
(2) Independent

B. (1) high
(2) Concurrent

C. (1) low
(2) Independent

D. (1) low
(2) Concurrent

61. Preparations for core off-load are in progress IAW 1-OP-4.1, Controlling Procedure for Refueling.

Which ONE of the following conditions **DOES NOT** meet the requirements of 1-OP-4.1, Attachment 2, Core Alterations Checklist?

A. Refueling Cavity Level is 290 feet

B. "A" Containment Air Recirc Fan (CARF) running, "B" and "C" CARFs tagged out

C. N-31 is operable and N-32 is tagged out

D. Personnel Air Lock Emergency Escape doors are closed with the operating handles CAUTION tagged

62. Unit 1 is at 95% power and stable.

The reactor operator is calculating core thermal power IAW 1-PT-24, Hand Calorimetric, but does not include the effects of reactor coolant pump heat or steam generator blowdown flow.

Which of the choices below correctly completes the following statements concerning the calculated core thermal power?

Not including reactor coolant pump heat will cause the calculated value to be ___(1)___ than actual power.
AND
Not including steam generator blowdown flow will cause the calculated value to be ___(2)___ than actual power.

A. (1) lower
(2) lower

B. (1) lower
(2) higher

C. (1) higher
(2) higher

D. (1) higher
(2) lower

63. Unit 1 is at 100% power.

Operators have performed 1-MOP-31.6, Subsection 5.1, Removing 1-FW-P-1A, Main Feedwater Pump, from Service and Tagging the Pump for Maintenance, and have pulled the patch cords for the associated annunciators in accordance with the procedure.

The associated annunciators are _____ to be added to the Disabled Annunciator List and are _____ to be entered into the Temporary Modifications Log.

A. required ; **NOT** required

B. required ; required

C. **NOT** required ; **NOT** required

D. **NOT** required ; required

64. Unit 1 core off-load is in progress.

SFP level and Reactor Cavity level begin decreasing.

IAW 0-AP-27, Malfunction of Spent Fuel Pit System, the Fuel Building is required to be evacuated _____

A. if a high alarm is recieved on 1-RMS-RM-153, SFP Bridge Crane rad monitor

B. as soon as all fuel assemblies are in a safe location

C. if radiation levels in the Fuel Building reach 1 R/HR

D. if level decreases more than 4 feet 2 inches below the "0" reference mark

65. Isolation of Service Water blowdown (close 1-SW-15, Service Water Supply Header #1 to Liquid Waste System Isolation Valve) is listed in 0-GOP-17, Time Critical Operations Actions.

Which ONE of the following identifies the **upper time limit** for closing this valve, and includes the reason for this upper time limit?

A. 29 minutes ; auxiliary building flooding

B. 29 minutes ; auxiliary building radiation levels

C. 59 minutes ; auxiliary building flooding

D. 59 minutes ; auxiliary building radiation levels

66. IAW VPAP-2101, Radiation Protection Program, which of the choices below correctly completes the following statements?

A radiation worker can receive ___(1)___ Rem TEDE prior to exceeding the annual radiation worker administrative dose limit for their home site.

AND

A radiation worker can receive ___(2)___ Rem TEDE prior to exceeding the annual radiation worker 10CFR20 Federal dose limit.

A. (1) 2
(2) 3

B. (1) 2
(2) 5

C. (1) 1.7
(2) 3

D. (1) 1.7
(2) 5

67. Given the following:
    - A Large break LOCA occurred on Unit 1.
    - The crew has transitioned to 1-ES-1.3, Transfer to Cold Leg Recirculation, and are in the process of verifying proper Service Water System Operation IAW Step 3 of 1-ES-1.3.

    The STA reports Critical Safety Function Status Trees (CSFSTs) are as follows:
    Subcriticality - Green
    Core Cooling - Orange
    Heat Sink - Red
    RCS Integrity - Red
    Containment - Yellow
    Inventory - Yellow

    Which ONE of the following correctly identifies the crew response?

    A. Immediately transition to 1-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition

    B. Immediately transition to 1-FR-C.1, Response to Inadequate Core Cooling

    C. Immediately transition to 1-FR-H.1, Response to Loss of Secondary Heat Sink

    D. Continue with ES-1.3, Transfer to Cold Leg Recirculation

68. Assume the EPIPs are entered and a Notification of Unusual Event is declared at 12:00.

IAW the applicable Emergency Plan procedures, the State must be notified no later than _____ and activation of the TSC is _____.

A. 12:15 ; Required

B. 12:15 ; **NOT** Required

C. 13:00 ; Required

D. 13:00 ; **NOT** Required

69. Assume the initial notification of state and local governments of an ALERT Classification has been made.

Select the choice that correctly completes the following:

IAW EPIP-2.01, Notification of State and Local Governments, a follow-up report (update) should be provided to state and local governments approximately every ____(1)____ (unless otherwise agreed upon with the State); changing the Emergency Classification to Notification of Unusual Event ____(2)____ one of the update criteria of EPIP-2.01.

A. 60 minutes ; is **NOT**

B. 60 minutes ; is

C. 30 minutes ; is **NOT**

D. 30 minutes ; is

70. Unit 1 is at 100% power with all equipment in a normal configuration.

A LOCA occurs and the crew enters 1-E-0, Reactor Trip or Safety Injection.

Which of the choices below correctly completes the following:

____(1)___ is an indication of RCS leakage into the Safeguards building

AND

____(2)___ will have to be closed by the operator to isolate the leak IAW 1-ECA-1.2, LOCA Outside Containment.

A. (1) High alarm on 1-VG-RI-180-1, (MGP) Vent Stack B Noble Gas Normal Range
(2) 1-SI-MOV-1890C & 1890D, Low Head SI Pumps Cold Leg Injection Valves

B. (1) High alarm on 1-VG-RI-180-1, (MGP) Vent Stack B Noble Gas Normal Range
(2) 1-SI-MOV-1890A & 1890B, Low Head SI Pumps Hot Leg Injection Valves

C. (1) High alarm on 1-VG-RI-179-1, (MGP) Vent Stack A Noble Gas Normal Range
(2) 1-SI-MOV-1890C & 1890D, Low Head SI Pumps Cold Leg Injection Valves

D. (1) High alarm on 1-VG-RI-179-1, (MGP) Vent Stack A Noble Gas Normal Range
(2) 1-SI-MOV-1890A & 1890B, Low Head SI Pumps Hot Leg Injection Valves

71. Unit 1 was tripped from 100% power due a Condensate System header rupture.

Subsequently a Tornado struck damaging the Unit 1 ECST.

Current status is:

- The Shift Manager directed securing Unit 1 AFW pumps to prevent them from operating without a suction source
- Operators have transitioned to 1-FR-H.1, Response to Loss of Secondary Heat Sink.
- Wide Range SG levels are approximatley 50% and slowly decreasing.
- Operators are at Step 2 of 1-FR-H.1 "Try to Establish AFW Flow to at Least One SG".

Which of the following choices identifies (1) the action required by 1-FR-H.1 with respect to the RCPs and (2) the **preferred** source of alternate makeup water for the AFW pumps?

A. (1) Stop ALL RCP's
(2) Fire Main Water from the lake

B. (1) Stop ALL RCP's
(2) Service Water

C. (1) Stop ALL but ONE RCP
(2) Fire Main Water from the lake

D. (1) Stop ALL but ONE RCP
(2) Service Water

72. Given the following:
    - A Large steam break occurred outside CNTMT on the "A" Main Steamline
    - Offsite power was subsequently lost
    - The crew has transitioned to 1-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition
    - SI has been terminated
    - Letdown is NOT in-service
    - The crew is at step 17 "Depressurize RCS to Decrease RCS Subcooling"

    Based on the above, the OATC will depressurize using _____, and stop the depressurization at 69% PRZR LEVEL in order to _____?

    A. ONE PRZR PORV ; ensure the PRZR has a substantial steam bubble for pressure control

    B. ONE PRZR PORV ; limit reactor vessel head voiding for core cooling

    C. Auxiliary spray ; ensure the PRZR has a substantial steam bubble for pressure control

    D. Auxiliary spray ; limit reactor vessel head voiding for core cooling

73. Given the following:
- The reactor was tripped 45 minutes ago.
- All RCPs were tripped.
- The plant cooldown is being performed in accordance with 1-ES-0.3, Natural Circulation Cooldown With Steam Void in Vessel (With RVLIS).
- The crew is preparing to start a RCP

Current plant conditions are:
- RVLIS Upper Range indication is 80% and stable.
- PRZR level 30% and stable
- RCS Subcooling based on core exit TCs 60°F and stable

Which ONE of the following describes the relationship of the current plant conditions to those required by 1-ES-0.3 for starting the RCP?

A. Current plant conditions are acceptable for RCP start

B. PRZR level is acceptable for RCP start ; RCS Subcooling is **NOT** acceptable for RCP start

C. PRZR level is **NOT** acceptable for RCP start ; RCS Subcooling is acceptable for RCP start

D. PRZR level is **NOT** acceptable for RCP start ; RCS Subcooling is **NOT** acceptable for RCP start

74. Given the following:
- A LOCA has occurred.
- **NO** LHSI pumps could be started and the crew has transitioned from 1-E-1, Loss of Reactor or Secondary Coolant, to 1-ECA-1.1, Loss of Emergency Coolant Recirculation
- Containment pressure has been slowly increasing throughout the event and is 21 psia and still slowly increasing.
- RWST level is 86% and lowering.
- The Recirc Spray sump level is 2 feet.
- The crew is at step 8, Determine Containment Spray Requirements.

IAW 1-ECA-1.1, which of the choices below identifies:

(1) how many Recirc Spray pumps are required to be operating
AND
(2) how many Quench Spray pumps are required to be operating?
(Reference Provided)

A. (1) 0 recirc spray pumps are required
(2) 2 quench spray pumps are required

B. (1) 0 recirc spray pumps are required
(2) 0 quench spray pumps are required

C. (1) 2 recirc spray pumps are required
(2) 2 quench spray pumps are required

D. (1) 2 recirc spray pumps are required
(2) 0 quench spray pumps are required

75. Unit 1 is on Cold Leg Recirculation following a LOCA and Loss of Offsite Power.

The following Containment conditions exist:
- CNTMT Pressure 22 psia and slowly increasing
- CNTMT Sump Level 12 feet and slowly increasing

Based on the Containment conditions the crew is required to implement _____ in order to mitigate the potential for_____.

A. 1-FR-Z.1, Response to High Containment Pressure; accident doses to exceed acceptable limits

B. 1-FR-Z.1, Response to High Containment Pressure; equipment qualification limits to be exceeded

C. 1-FR-Z.2, Response to High Containment Sump Level; plant components/indications to be damaged by flooding

D. 1-FR-Z.2, Response to High Containment Sump Level; excessive depletion of Service Water Reservoir inventory

76. Unit 2 is performing a startup following a mid-cycle maintenance outage.

RCS boron concentration value used in the ECP calculation is 1000 ppm.
Actual current RCS boron concentration is 1100 ppm.

Which of the choices below identifies:

(1) The impact this error will have on the actual critical rod position.
AND
(2) The actions that the Unit Supervisor is required to direct the crew to perform if criticality is **NOT** reached within the ECP limits IAW 2-OP-1.5, Unit Startup from Mode 3 to Mode 2.

A. (1) Actual critical rod position will be **LOWER** than the ECP.
(2) Start a boration of 10 gpm, insert D control bank to 5 steps and manually trip the reactor.

B. (1) Actual critical rod position will be **LOWER** than the ECP.
(2) Insert D control bank to 5 steps and manually trip the reactor.

C. (1) Actual critical rod position will be **HIGHER** than the ECP.
(2) Insert D control bank to 5 steps and manually trip the reactor.

D. (1) Actual critical rod position will be **HIGHER** than the ECP.
(2) Insert all control banks to 0 steps and recalculate the ECP.

77. Unit 1 is exiting a scheduled refueling outage and is currently at 29% and stable, holding for chemistry.

All controls are in auto.

Selected First Stage Pressure channel fails high

Which of the following choices:
(1) identifies the initial reactor power response
AND
(2) includes the procedure that contains the operator actions to address the failed instrument?

A. decrease;
1-AP-1.1, Continuous Uncontrolled Rod Motion

B. decrease;
1-AP-3, Loss of Vital Instrumentation

C. increase;
1-AP-1.1, Continuous Uncontrolled Rod Motion

D. increase;
1-AP-3, Loss of Vital Instrumentation

78. Unit 1 reactor is being started up following a mid-cycle outage.

After inserting control rods to stabilize power, annunciator A-F1, CMPTR ALARM ROD DEV/SEQ, alarms.

Control Rod H-2 did not change from it's initial value and is now 16 steps different than the associated group position indication because of a blown lift coil fuse.

Intermediate Ranges NIs indicate 8E-9 amps and stable.

Based on the above, which of the following choices identifies:

(1) the status of the Control Rod H-2
AND
(2) whether or not a reactor trip is required IAW 1-AP-1.3, Control Rod Out of Alignment?

A. (1) Control Rod H-2 is inoperable
(2) Reactor Trip is **NOT** required

B. (1) Control Rod H-2 is inoperable
(2) Reactor Trip is required

C. (1) Control Rod H-2 is operable
(2) Reactor Trip is **NOT** required

D. (1) Control Rod H-2 is operable
(2) Reactor Trip is required

79. Given the following sequence of events:

- Unit 1 was initially at 100% power when a spurious Safety Injection occurred.
- The crew has progressed through 1-ES-1.1, SI Termination, and is in the process of establishing Letdown.
- 1-RC-PCV-1456, PRZR PORV, opens and cannot be closed or isolated.
- RCS pressure is 1100 psig and decreasing.
- All steam generators are stable at 1000 psig.

Which ONE of the following identifies the direction the SRO is required to provide to the crew?

A. Manually initiate SI and go to 1-E-0, Reactor Trip or Safety Injection.

B. Manually initiate SI and go to 1-E-1, Loss of Reactor or Secondary Coolant.

C. Manually start Charging Pumps, align BIT and go to 1-E-1, Loss of Reactor or Secondary Coolant.

D. Manually start Charging Pumps, align BIT and go to 1-E-0, Reactor Trip or Safety Injection.

80. Unit 1 initial conditions:

- Reactor power = 100%
- SGTR = 275 gpm on 1A SG
- Reactor is manually tripped
- 1C RCP trips

Current conditions:

- 1-E-3 (STEAM GENERATOR TUBE RUPTURE) is in progress
- It is determined that Pzr spray is not adequately reducing RCS pressure and the decision is made to use the Pressurizer PORV to reduce RCS pressure.

Based on the above conditions, which ONE of the following states: (1) the reason for minimizing the cycling of the Pressurizer PORV and (2) the procedure that 1-E-3 directs you to perform if, during the depressurization, the Pressurizer PORV and its associated block valve CAN NOT be CLOSED?

A. (1) To reduce the chance of Pressurizer PORV failure.
(2) 1-ECA 3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL.

B. (1) To reduce the chance of Pressurizer PORV failure.
(2) 1-ECA 3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY.

C. (1) To prevent the Tube rupture from degrading.
(2) 1-ECA 3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL.

D. (1) To prevent the Tube rupture from degrading.
(2) 1-ECA 3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY.

81. Unit 1 is at 4% following a scheduled refueling outage.

Intermediate Range N-35 spiked low once on the previous shift and was placed in Level Trip Bypass.

Technicians from the Instrument Shop are in the Control Room to begin troubleshooting.

The Technicians report that although their work package stated to remove the Instrument Power fuses from the N-35 drawer they have removed the Control Power fuses in error.

The OATC reports the unit is stable at 4% power.

Which ONE of the following identifies the required action based on these plant conditions?

A. Manually trip the reactor and enter 1-E-0.

B. Begin an orderly shutdown of the reactor.

C. Enter 1-AP-4.2, Malfunction of Nuclear Instrumentation (Intermediate Range), reactor trip or shutdown is **NOT** required.

D. Enter 1-AP-4.1, Malfunction of Source Range Nuclear Instrumentation, reactor trip or shutdown is **NOT** required.

82. Unit 1 is at 100 % power.

1-FW-L-1475, A SG level channel II, develops a leak on the reference leg.

Which of the choices below correctly identifies:

(1) The impact of this malfunction on the affected channel.
AND
(2) The **most limiting action** (REQUIRED ACTION with the shortest COMPLETION TIME) that applies to Unit 1.

A. (1) 1-FW-L-1475 indication will **INCREASE**
(2) Verify interlock is in required state for existing unit condition within 1 hr.

B. (1) 1-FW-L-1475 indication will **INCREASE**
(2) Place channel in trip within 72 hours.

C. (1)1-FW-L-1475 indication will **DECREASE**
(2) Verify interlock is in required state for existing unit condition within 1 hr.

D. (1)1-FW-L-1475 indication will **DECREASE**
(2) Place channel in trip within 72 hours.

83. Given the following:

- Unit 1 is in Mode 5.
- RHR is in service.
- RCS temperature is stable at 190°F.
- RCS pressure is 320 psig and lowering slowly.
- Containment sump level is rising slowly.
- Containment Gaseous & Particulate Radiation Monitors are both trending up.
- The OATC has 1-CH-FCV-1122 in MANUAL with 100% demand and 1-CH-HCV-1142 at 0% demand.
- Pressurizer level is 24% and slowly lowering.

Which ONE of the following identifies the procedure used to address the event in progress and the mitigation actions this procedure will require?

A. 1-AP-11, Loss of RHR ; manually initiate SI

B. 1-AP-11, Loss of RHR ; manually align cold leg injection

C. 1-AP-17, Shutdown LOCA ; manually initiate SI

D. 1-AP-17, Shutdown LOCA ; manually align cold leg injection

84. In accordance with Technical Specifications, which of the choices below correctly completes the following statements:

Primary to Secondary leakage is _____(1)_____ leakage.

The limit of 150 gallons per day is based on _____(2)_____.

A. (1) IDENTIFIED
(2) minimize the frequency (occurrence) of SG tube ruptures

B. (1) IDENTIFIED
(2) ensuring control room and offsite doses do not exceed limits

C. (1) UNIDENTIFIED
(2) minimize the frequency (occurrence) of SG tube ruptures

D. (1) UNIDENTIFIED
(2) ensuring control room and offsite doses do not exceed limits

85. Unit 1 was operating at 100% power when the following sequence of events occurred:
    - Annunciator K-G6, N-16 RAD DET, alarms
    - RO reports N-16 modules for "C" SG AND Main Steam Header are in alarm and trending up
    - BOP reports 1-SV-RM-121, Condenser Air Ejector Radiation Monitor, indication has not changed
    - RO reports PRZR level rapidly decreasing
    - The crew trips the reactor and initiates SI

    Current Status:
    - The immediate actions of 1-E-0, Reactor Trip or Safety Injection, have just been completed.
    - All SGs are below the Narrow Range.
    - The BOP recommends isolating AFW flow to the "C" SG.

    Based on the above, which ONE of the following identifies how the US is required to proceed?

    A. allow the BOP to isolate AFW to "C" SG; contact HP & Chemistry for confirmation of the affected SG **prior** to initiating 1-E-0, Attachment 8, Ruptured SG Isolation.

    B. allow the BOP to isolate AFW to "C" SG; have the RO initiate 1-E-0, Attachment 8, Ruptured SG Isolation.

    C. **DO NOT** allow the BOP to isolate AFW to "C" SG; contact HP & Chemistry for confirmation of the affected SG **prior** to initiating 1-E-0, Attachment 8, Ruptured SG Isolation.

    D. **DO NOT**allow the BOP to isolate AFW to "C" SG; have the RO initiate 1-E-0, Attachment 8, Ruptured SG Isolation.

86. Unit 1 was initially at 100% power.

A loss of offsite power (LOOP) occurs and the only operator actions taken thus far are the immediate operator actions of 1-E-0, Reactor Trip or Safety Injection.

Which ONE of the following identifies the **most limiting action** (REQUIRED ACTION with the shortest COMPLETION TIME) that applies to Unit 1?

A. Enter TS 3.0.3 immediately

B. Restore one EDG to operable status within 2 hours

C. Restore one offsite circuit or one EDG to operable status within 12 hours

D. Restore one offsite circuit to operable status within 24 hours

87. Unit 1 is at **20%** power and ramping up following a scheduled refueling outage.

Annuciator K-D2, Rad Monitor System Hi Rad Level, alarms.

The Backboards operator reports 1-SV-RM-121, Condenser Air Ejector Radiation Monitor, HIGH alarm light is LIT.

Based on the above 1-SV-RM-121 is ___(1)___ and 1-SV-TV-102-2, Condenser Air Ejector Discharge to Vent Stack A, is ___(2)___.

A. (1) FUNCTIONAL
(2) closed

B. (1) FUNCTIONAL
(2) open

C. (1) NON-FUNCTIONAL
(2) closed

D. (1) NON-FUNCTIONAL
(2) open

88. Unit 1 is at 100% power.

On the previous shift when attempting to transfer 120v vital AC Bus 1-I from its associated Constant Voltage Transformer to Inverter 1-I the Sync light failed to light and the procedure was halted.

120v vital AC Bus 1-I is being powered from its associated Constant Voltage Transformer with Inverter 1-I tagged out for corrective maintenance.

<u>The POD has the following item scheduled:</u>

- Tagout 1J EDG to allow Engineering to inspect various panels.

IAW Technical Specifications, which of the following choices identifies:

(1) the status of the 1-I VITAL AC BUS
AND
(2) whether tagout of 1J EDG is allowed or not

A. (1) The 1-I VITAL AC BUS is inoperable
(2) Tagout of 1J EDG is allowed

B. (1) The 1-I VITAL AC BUS is operable
(2) Tagout of 1J EDG is allowed

C. (1) The 1-I VITAL AC BUS is inoperable
(2) Tagout of 1J EDG is **NOT** allowed

D. (1) The 1-I VITAL AC BUS is operable
(2) Tagout of 1J EDG is **NOT** allowed

89. Unit 1 is at 100%.

- 1-MS-PCV-101A ("A" SG PORV) has been isolated by closing the inlet isolation valve due to leak by.
- 1-MS-PCV-101B ("B" SG PORV) has developed an air leak and instrument air has been isolated to the PORV.

IAW TS 3.7.4, Steam Generator Power Operated Relief Valves, and TS 3.7.4 Bases, which of the choices below correctly completes the following statements?

(1) The "A" SG PORV is _____.
(2) The "B" SG PORV is _____.

A. (1) operable
(2) operable

B. (1) operable
(2) inoperable

C. (1) inoperable
(2) operable

D. (1) inoperable
(2) inoperable

90. Unit 1 is heating up following a scheduled refueling outage and is currently at 310°F and slowly increasing.

You are the oncoming SRO and in the process of walking down the boards observe that the Containment Purge Supply and Purge Exhaust valves, (1-HV-MOV-100A, B, C & D), all have green lights ON and red lights OFF.

With respect to your observation, this configuration is _____ with 1-OP-1E, Containment Integrity Checklist; according to the Applicable Safety Analysis of TS 3.6.3, Containment Isolation Valves, Bases, the DBA analysis assumes that the Purge Valves are _____?

A. in compliance ; open and will isolate within 60 seconds after the accident

B. in compliance ; in the closed position at the onset of the accident

C. NOT in compliance ; open and will isolate within 60 seconds after the accident

D. NOT in compliance ; in the closed position at the onset of the accident

91. Unit 1 is at 29% holding for chemistry following a scheduled refueling outage.

Annunciator J-F2, Containment Partial Press +0.1 PSI CH I-II, alarms

The OATC reports the following:
- Containment Sump Level - increasing
- PRZR Level - stable
- Charging Flow - stable
- Reactor power - stable

Several minutes later Annunciator J-G1, Containment Partial Press +0.25 PSI CH I-II, alarms and the OATC reports there are no changes in the parameters reported above.

Which of the following choices:

(1) identifies the cause of these plant conditions

AND

(2) correctly states the Technical Specification Bases for the TS 3.6.4 Containment Pressure LCO ?

A. (1) Leakage from a Main Feed Line
(2) ensure the Containment structure will depressurize to less than 2.0 psig within 6 hours following a DBA

B. (1) Leakage from a Main Feed Line
(2) ensure the Containment structure will depressurize to subatmospheric pressure within 6 hours following a DBA

C. (1) Leakage from a Main Steam Line
(2) ensure the Containment structure will depressurize to less than 2.0 psig within 6 hours following a DBA

D. (1) Leakage from a Main Steam Line
(2) ensure the Containment structure will depressurize to subatmospheric pressure within 6 hours following a DBA

92. IAW OP-AA-100, Conduct of Operations, a Standing Order can be used to address Technical Requirements Manual (TRM) requirements that are determined to be improper or inadequate.

Which of the choices below correctly completes the following statements?

The Standing Order ___(1)___ required to be presented to the Facility Safety Review Committee (FSRC) prior to implementation.
AND
The Standing Order ___(2)___ be issued to impose less restrictive requirements.

A. (1) is
(2) can

B. (1) is
(2) can **NOT**

C. (1) is **NOT**
(2) can

D. (1) is **NOT**
(2) can **NOT**

93. Unit 2 is shutting down for a normal refueling outage.

Sequence of events:

Sunday 2000:	All RCPs are secured
Tuesday 0200:	Commenced isolating RCS loops
Wednesday 0800:	PRZR drained less than 5% level
Thursday 0200:	Commenced detensioning the reactor vessel head

IAW operating procedures, which of the above is the first activity that requires the containment closure team to be established?

A. All RCPs are secured

B. Commenced isolating RCS loops

C. PRZR drained less than 5% level

D. Commenced detensioning the reactor vessel head

94. Which ONE of the following describes the personnel requirements of OP-AA-106, Infrequently Conducted or Complex Evolutions (ICCE), for conducting a **Category I** ICCE ?

A. a Senior Operations Manager is not required, a test coordinator is not required

B. a Senior Operations Manager is required, a test coordinator is not required

C. a Senior Operations Manager is not required, a test coordinator is required

D. a Senior Operations Manager is required, a test coordinator is required

95.

Initial Conditions:

- Unit 1 is shutting down for a scheduled refueling.
- CRDM fans are tagged out.
- CARFs are all running.
- Operators are preparing to place RHR in service.

Current Conditions:

- A loss of offsite power occurs.
- No operator actions have occurred.

Based on the above, select the choice that correctly completes the following statement.

1-RM-RMS-159/160, Containment Atmosphere Radiation Monitor (gaseous and particulate) ___(1)___ and the Digital Containment Partial Air Pressure Indicators ___(2)___.

A. (1) are required to be declared inoperable
(2) are required to be declared inoperable

B. (1) are required to be declared inoperable
(2) are NOT required to be declared inoperable

C. (1) are NOT required to be declared inoperable
(2) are required to be declared inoperable

D. (1) are NOT required to be declared inoperable
(2) are NOT required to be declared inoperable

96. Given the following plant conditions:
- A General Emergency exists.
- The TSC is manned and functional.
- HP surveyed an area in which emergency repairs are needed and determined radiation levels are up to 100 Rem/Hr.
- The worker performing the repairs has received life threatening injuries and must be rescued.
- No one has volunteered to rescue the injured person and a rescuer has been chosen from a group of non-volunteer personnel.

Based on these plant conditions, select the choice below that correctly completes the following statement:

IAW EPIP-4.04, Emergency Personnel Radiation Exposure, the rescuer may receive up to __(1)__ Rem TEDE with authorization from the ___(2)___.

A. (1) 10
(2) Radiological Assessment Director

B. (1) 10
(2)Station Emergency Manager

C. (1) 25
(2) Radiological Assessment Director

D. (1) 25
(2) Station Emergency Manager

97. Given the following:
15:00 Both Units were at 100% power when the control room was evacuated due to a fire.
15:02 Offsite power is lost.
15:12 ROs have established control from the Aux Shutdown Panels and report unit conditions stable.

Based on these plant conditions, which of the following choices:

(1) identifies the Emergency Classification that is required to be declared
AND
(2) correctly states whether the cooldown of Units 1&2 is required to be conducted sequentially or simultaneously in accordance with 0-FCA-1, Control Room Fire.

(Reference Provided, Note: do not use EAL identifier H.6, SEM Judgement)

A. (1) Alert
(2) sequential cooldown

B. (1) Alert
(2) simultaneous cooldown

C. (1) Site Area Emergency
(2) sequential cooldown

D. (1) Site Area Emergency
(2) simultaneous cooldown

98. Unit 1 is at 100% power.

12:00 Excess Letdown is placed in service
12:01 OATC notes CC Head Tank level is increasing
12:04 Excess Letdown is removed from service, OATC reports CC head Tank level is stable
12:08 STA quantifies leakage into the CC head tank was 120 gallons

Based on the above, Notification to the State within 15 minutes _____ required and Notification to the NRC within 1 hour _____ required.

(Reference Provided, Note: do not use EAL identifier H.6, SEM Judgement)

A. is ; is

B. is ; is NOT

C. is NOT ; is

D. is NOT ; is NOT

99. Unit 1 was at 100% power when the following sequence of events occurred:
    - A LOCA outside of containment has occurred.
    - Manual reactor trip and SI have been actuated.
    - The crew has transitioned from 1-E-0, Reactor Trip or Safety Injection to 1-ECA-1.2, LOCA Outside Containment.
    - Following isolation of the cold leg injection piping, RCS pressure has started to increase.

    Which ONE of the following identifies the correct procedure transitions from 1-ECA-1.2?

    A. 1-E-0, Reactor Trip or Safety Injection

    B. 1-E-1, Loss of Reactor or Secondary Coolant

    C. 1-ECA-1.1, Loss of Emergency Coolant Recirculation Capability

    D. 1-ES-1.1, Safety Injection Termination

100. Unit 1 was initially at 100% power with the following equipment tagged out:
- 1-FW-P-3A, Motor-driven AFW pump

A seismic event results in a loss of offsite power and damage to all main steam lines in the Main Steam Valve House.

Current status is:
- The crew is currently performing 1-ECA-2.1, Uncontrolled Depressurization of All Steam Generators.
- All SGs are 800 psig and slowly decreasing
- All SG levels below the Narrow Range
- 1-FW-P-2, Turbine-driven AFW, tripped shortly after starting up and operators are unable to reset it.
- The crew has just shutdown the 1J EDG due to a leak on the radiator.

Based on the current status, which of the following choices identifies:

(1) whether transition to 1-FR-H.1, Loss of Secondary Heat Sink, is required or not
AND
(2) which procedure is required to be performed concurrently with the EOPs

A. (1) Transition to 1-FR-H.1 is **NOT** required
(2) perform 1-AP-22.6, Loss of 1-FW-P-2 Turbine-driven AFW Pump and One Motor-Driven AFW Pump, concurrently with the EOPs

B. (1) Transition to 1-FR-H.1 is **NOT** required
(2) perform 0-OP-6.4, Operation of the SBO Diesel (SBO Event), to re-energize 1J 4160v bus, concurrently with the EOPs

C. (1) Transition to 1-FR-H.1 is required
(2) perform 1-AP-22.6, Loss of 1-FW-P-2 Turbine-driven AFW Pump and One Motor-Driven AFW Pump, concurrently with the EOPs

D. (1) Transition to 1-FR-H.1 is required
(2) perform 0-OP-6.4, Operation of the SBO Diesel (SBO Event), to re-energize 1J 4160v bus,concurrently with the EOPs

REFERENCE PROVIDED TO APPLICANT

1-ECA-1.1 Page 8 of 36, Rev 17

EAL TABLES
- HOT CONDITIONS
- COLD CONDITIONS

GFE EQUATIONS AND CONVERSIONS SHEET

NAPS 2012 NRC EXAM
ANSWER KEY

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