

**U.S. Nuclear Regulatory Commission  
Site-Specific  
Written Examination**

**Applicant Information**

Name:	Region: II
Date: 07/27/01	Facility/Unit: Brunswick 1 & 2
License Level: RO	Reactor Type: GE BWR-4
Start Time:	Finish Time:

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected six hours after the examination starts.

**Applicant Certification**

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

\_\_\_\_\_   
Applicant's Signature

**Results**

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

1. The CRD system is being restarted per OP-08 following a trip of the running CRD pump. CRD system configuration:

CRD pump A	Running
CRD flow control valve	Auto
CRD drive water pressure valve	Full open
CRD system flow	45 gpm
Cooling water dp	20 psid

The operator is directed to throttle the drive pressure valve (F003) to establish drive water differential pressure between 260 and 275 psid. As the operator throttles this valve, which ONE (1) of the following describes how the CRD flow control valve (FCV) will respond? The FCV will throttle:

- A. open, and drive water dp will drop.
  - B. open, and drive water dp will rise.
  - C. closed, and drive water dp will drop.
  - D. closed, and drive water dp will rise.
2. During a plant startup per GP-02, control rod 18-35 is selected and being withdrawn to position 12, its withdraw limit. The individual reed switch at position 12 for this rod is failed. Loss of the individual reed switch for the selected rod will cause the RWM to do which ONE (1) of the following?
- A. The RWM will go to the LPSP, regardless of actual reactor power.
  - B. The RWM will sense that a BPWS incompatible pattern is selected, generate a "critical self-test failure" and generate rod blocks.
  - C. The RWM will cause an insert and withdraw block until a substitute position is placed in the RWM memory.
  - D. The RWM will require removing the rod from the BPWS and establishing a position allowed by the RWM pattern.

3. Which ONE (1) of the following occurs when Recirculation Pump speed is increased?

A. There is a temporary increase in core void content which causes a decrease in moderator density with a resultant decrease in neutron moderation. The steam generation rate decreases which causes a positive reactivity effect.

✓B. There is a temporary decrease in core void content which causes an increase in moderator density with a resultant increase in neutron moderation. The steam generation rate increases which causes a negative reactivity effect.

C. There is a temporary decrease in core void content which causes an increase in moderator density with a resultant increase in neutron moderation. The steam generation rate decreases which causes a positive reactivity effect.

D. There is a temporary increase in core void content which causes a decrease in moderator density with a resultant decrease in neutron moderation. The steam generation rate increases which causes a negative reactivity effect.

4. The signal from one of the recirculation pump speed controller suddenly decreases from 20 Ma to less than 1 Ma. The signal failure circuit annunciates a signal failure alarm in the Control Room and which ONE (1) of the following?

A. Limits the Recirc M-G set speed demand to 28%.

B. Fully inserts the scoop tube.

C. Fully retracts the scoop tube.

✓D. Locks the scoop tube in its present position.

5. Unit 2 is operating at 100% power with  $\sim 35.42 \times 10^6$  lbm/hr driving flow and  $\sim 41.5 \times 10^6$  lbm/hr driven flow. Steam flow is  $\sim 11.077 \times 10^6$  lbm/hr.

Total flow through the core is broken down as follows:

90% of the total flow is through the fuel channels

10% of the total flow bypasses the fuel by design

Which ONE (1) of the following is closest to the recirculation ratio?

A.  $\sim 3.0/1$

B.  $\sim 3.8/1$

C.  $\sim 6.3/1$

✓D.  $\sim 7.0/1$

6. Which ONE (1) of the following describes the RHR Pump input to ADS logic?
- A. Transmitters from pumps A and C provide signals to the "A" logic system. Signals from pumps B and D provide inputs to the "B" logic system.
  - B. Transmitters from pumps A and D provide signals to the "A" logic system. Signals from pumps B and C provide inputs to the "B" logic system.
  - C. Transmitters from pumps B and C provide signals to the "A" logic system. Signals from pumps A and D provide inputs to the "B" logic system.
  - ✓D. Transmitters from pumps B and D provide signals to the "A" logic system. Signals from pumps A and C provide inputs to the "B" logic system.
7. Unit 1 is at 50% power when the only operating Reactor Feedwater Pump trips. Reactor water level is decreasing rapidly and is currently +177 inches. Annunciator A-07 2-2 (REACTOR WTR LVL HI/LOW) is sealed in.
- If Reactor water level lowers to +125" before HPCI is manually started to restore level to normal, the recirculation pump speed control system will do which ONE (1) of the following?
- A. trip both recirculation pumps.
  - B. maintain the current recirculation pump speed.
  - ✓C. decrease recirculation pump speed on both recirculation pumps to 28%.
  - D. decrease recirculation pump speed on both recirculation pumps to 45%.
8. Following a LOCA a single Core Spray Pump is delivering rated flow of 4720 gpm at a discharge pressure of 290 psig. The discharge is into a Reactor vessel at 85 psig. The pump shut off head is 790 ft. Core spray was secured for five minutes and the vessel pressure slowly rose to 100 psig. Which ONE (1) of the following describe the condition of the Core Spray System if the same train was restarted? (Assume no operator action, except turning on the pump)
- A. Deliver 4720 gpm at a higher discharge pressure.
  - B. Deliver 4720 gpm at a lower discharge pressure.
  - ✓C. Deliver a lower flow rate at a higher discharge pressure.
  - D. Deliver a higher flow rate at a lower discharge pressure.

9. Which ONE (1) of the following describes why the SLC solution enters the Reactor Vessel through the SLC/core differential pressure line penetration?

- A. To accommodate differential movement between the shroud and the vessel.
- B. To maintain a differential temperature limit between the RPV top and bottom head of less than 145°F.
- ✓C. To ensure adequate mixing of the SLC solution with the reactor water when natural circulation exists with normal reactor water level.
- D. To ensure an adequate flow measurement during the SLC solution injection phase.

10. A Unit One reactor startup is in progress. The following plant conditions exist:

RPS Shorting Links Installed  
Reactor power is 15/40 scale, Range 3 IRMs

The Reactor Operator has just calculated doubling time to be 100 seconds and inadvertently ranged IRM F DOWN from Range 3 to Range 2.

This will cause which ONE (1) of the following?

- A. a rod block only.
  - B. a full reactor scram.
  - ✓C. a half scram, and a rod block.
  - D. no RPS or rod block functions.
11. A Unit One (1) TIP trace is being run in the MANUAL mode using TIP machine "C" which is currently at the core top limit. With TIP machine "C" ball valve control switch held in OPEN, RPV water level lowers to Low Level 1.

Which ONE (1) of the following is correct concerning TIP machine "C"?

- A. It must be manually withdrawn to the inshield position then the ball valve will automatically close.
- B. It will auto withdraw to the inshield position then the ball valve will automatically close.
- C. It must be manually withdrawn to the inshield position then the ball valve must be manually closed.
- ✓D. It will auto withdraw to the inshield position then the ball valve must be manually closed.

12. A Unit Startup is in progress; conditions are as follows:

RPS Shorting Links are INSTALLED  
IRM A Range 3 reading is 50/125  
IRM B Range 2 reading is 50/125

All other IRMs are on Range 3 between 15/125 and 50/125. No IRMs are bypassed. The CO is withdrawing SRMs. SRM counts are as follows:

SRM A	5000 cps
SRM B	90 cps
SRM C	180 cps
SRM D	6000 cps

The CO performs the following IRM Range Switch actions:

- A) IRM A taken to Range 2
- B) IRM B taken to Range 3

This will cause which ONE (1) of the following:

- A. a rod block only.
- B. no RPS or rod block functions.
- C. a full reactor scram and a rod block.
- ✓D. a half reactor scram and a rod block.

13. Testing of the SRM RETRACT NOT PERMITTED Rod Block is in progress on Unit One (1). The CO inserts SRM A until the Detector Full In light is illuminated and observes that the Drive In pushbutton light goes out. The CO selects SRM B and depresses the Drive Out pushbutton and observes no apparent response of SRM B.

SRM B will not retract because of which ONE (1) of the following?

- A. Distribution Panel 1AB-RX is deenergized.
- B. I&C failed to reset the Trip Unit for SRM A Rod Block.
- ✓C. The CO failed to reset the seal in Drive In Pushbutton.
- D. I&C failed to raise SRM B count rate above 125 cps to allow a Retract Permissive.

14. While operating at 100% power, a 1/2 scram on RPS Channel A is received. The operator notes the following:

APRM UPSC TRIP/INOP SYS A alarm sealed in  
NEUTRON MON SYS TRIP alarm sealed in  
APRM C Upscale/Inop trip light illuminated on P603  
APRM C Inop trip light illuminated on P608

Which ONE (1) of the following could be the cause of the APRM C failure?

- A. Only 1 input from a LPRM level B detector is in Operate.
  - B. 4 LPRM inputs have failed downscale.
  - C. 11 LPRM inputs are in Operate, one of those inputs has failed downscale.
  - D. 7 LPRM inputs have been placed to Bypass.
15. Level transmitter C32-LT-N004B has been selected to recorder C31-LPR-608. Which ONE (1) of the following does the signal from the recorder now provide?
- A. REACTOR WATER LEVEL HIGH/LOW Annunciator ONLY.
  - B. REACTOR WATER LEVEL HIGH/LOW Trip ONLY.
  - C. REACTOR WATER LEVEL HIGH/LOW Annunciator and trip ONLY.
  - D. REACTOR WATER LEVEL HIGH/LOW Annunciator, runback and trip.

16. Following a low reactor water level event on Unit 1, RCIC initiated. P601 indications for RCIC are as follows:

Turbine speed	4000 RPM
Pump discharge pressure	0 psig
Steam supply pressure	0 psig
Turbine exhaust pressure	0 psig
Pump suction pressure	Downscale
Pump flow	400 GPM

Which ONE (1) of the following is the most probable cause of this situation? The loss of:

- A. 125 Vdc power from Panel 3A.
- B. 125 Vdc power from Panel 3B.
- ✓C. 52.5 Vdc power supply only.
- D. 24 Vdc and 52.5 Vdc power supplies.

17. Unit 2 RCIC is in a normal standby alignment except for the RCIC Condensate Storage Tank Suction Valve, which is closed. Reactor Low Level Two, LL2, is received. Which ONE (1) of the following describes the automatic actions that will take place?

- ✓A. The Condensate Storage Tank Suction Valve will receive an open signal as long as at least one of the two Suppression Pool RCIC Suction Valves is not full open.
- B. The Condensate Storage Tank Suction Valve will receive an open signal as long as at least one of the two Suppression Pool RCIC Suction Valves is full open.
- C. The Condensate Storage Tank Suction Valve will receive a close signal only after the two Suppression Pool RCIC Suction Valves are fully open.
- D. The Condensate Storage Tank Suction Valve will receive an open signal, then it will receive a close signal after one of the two Suppression Pool RCIC Suction Valves are fully open.

18. The setpoint for the Unit 2 annunciator for SRV 2B21-F013C has been changed from 290°F to 340°F, while the Unit 1 annunciator for SRV 1B21-F013C remains at 290°F. Which ONE (1) of the following is the reason for the difference between units?
- A. The 2B21-F013C thermocouple is physically closer to the SRV main body than the other thermocouples. It reads 60 -70°F higher than the average group of SRV thermocouple indicators. The alarm set point was raised to accommodate the thermocouple position.
  - B. The 2B21-F013C thermocouple has a small unisolateable leak resulting in a tailpipe temperature that is 60 -70°F higher than the average group of SRV thermocouple indicators. The alarm set point was raised to accommodate this leak.
  - C. There is only one annunciator to alert operators of a leaking SRV on Unit 1. There are individual annunciators on Unit 2. The alarm set point was raised to allow the rest of the SRV thermocouples to be set at a lower temperature.
  - D. The 2B21-F013C thermocouple was replaced with a more accurate thermocouple. The alarm setpoint was raised to provide additional operational flexibility.
19. The two radiation detectors measuring reactor building exhaust radiation level, D12-RE-N010A/B, have exceeded their high-high setpoint. Which ONE (1) of the following describes the automatic actions that will take place?
- A. Channel A upscale initiates outboard CAC/CAD and all CAM/PASS isolations. Channel B upscale initiates inboard CAC/CAD and all CAM/PASS isolations.
  - B. Channel A upscale initiates outboard CAC/CAD and all inboard CAM/PASS isolations. Channel B upscale initiates inboard CAC/CAD and all outboard CAM/PASS isolations.
  - C. Channel A upscale initiates inboard CAC/CAD and all CAM/PASS isolations. Channel B upscale initiates outboard CAC/CAD and all CAM/PASS isolations.
  - D. Channel A upscale initiates inboard CAC/CAD and all outboard CAM/PASS isolations. Channel B upscale initiates outboard CAC/CAD and all inboard CAM/PASS isolations.
20. Unit One is in AOP-36.2 Station Blackout. You have just turned off the 120 Vac power supply breaker, 31A and 31B to the NUMAC steam leak detection modules. Which ONE (1) of the following was accomplished by this step?
- A. HPCI only will remain available.
  - B. HPCI and RCIC will remain available.
  - C. RHR only will remain available.
  - D. RHR and Core Spray will remain available.

21. Following a large break LOCA:

The suppression pool cooling valves have automatically closed as the result of a LPCI initiation.

The water level inside the core shroud is below the level equivalent to 2/3 of the core height, as indicated by both B21-LTM-N036-1 and N037-1.

A LPCI initiation signal is present.

Suppression pool temperature is above the maximum limit and cooling must be started.

Which ONE (1) of the following describes what must be done to initiate suppression pool cooling?

- ✓A. Place 2/3 core height LPCI initiation manual override keylock override switch E11-S18A (B) to MANUAL OVERRIDE position, place the "Think" switch E11-S17A(B) in MANUAL OVERRIDE, and RHR Service Water Booster Pump LOCA Override Switch to MANUAL OVERRIDE
- B. Place 2/3 core height LPCI initiation manual override keylock override switch E11-S18A (B) to MANUAL OVERRIDE position, place the "Think" switch E11-S17A(B) in MANUAL OVERRIDE, and RHR Service Water Booster Pump LOCA Override Switch to NORMAL.
- C. Place 2/3 core height LPCI initiation manual override keylock override switch E11-S18A (B) to Bypass position, place the "Think" switch E11-S17A(B) in MANUAL OVERRIDE, and RHR Service Water Booster Pump LOCA Override Switch to NORMAL.
- D. Place 2/3 core height LPCI initiation manual override keylock override switch E11-S18A (B) to MANUAL OVERRIDE position, leave the "Think" switch E11-S17A(B) in Normal, and place the RHR Service Water Booster Pump LOCA Override Switch to MANUAL OVERRIDE.

22. Unit Two is responding to a loss of fuel pool cooling using 0AOP-38.0, Loss of Fuel Pool Cooling. The operator is cautioned to Closely Monitor Fuel Pool Level during make up to the pool. Which ONE (1) of the following is the reason for this caution?

- A. To prevent the release of Iodine into containment atmosphere.
- ✓B. To prevent water from overflowing into the reactor building ventilation system.
- C. To prevent water from overflowing into the floor drain system.
- D. To prevent syphon draining of the fuel pool in the event of an RHR pump failure.

23. When steam is discharged from the safety relief valves (SRV) to the suppression pool water, which ONE (1) of the following describes the flow path taken by the SRV discharge and the reason for the path ?
- ✓A. The SRV discharges to a tailpipe which terminates in a manifold (T-Quencher) approximately seven feet below normal suppression pool water level. This provides even heat distribution in the suppression pool and reduced dynamic forces on the suppression chamber.
  - B. The SRV discharges to a tailpipe which terminates in a manifold (T-Quencher) approximately seven feet above the bottom of the suppression pool. This provides even heat distribution in the suppression pool, but does not significantly reduce the dynamic forces.
  - C. The SRV discharges to a tailpipe which connects to a ring header, the ring header terminates in a manifold (T-Quencher) approximately seven feet below normal suppression pool water level. This provides even heat distribution in the suppression pool, but does not significantly reduce the dynamic forces.
  - D. The SRV discharges to a tailpipe which connects to a ring header, the ring header terminates in a manifold (T-Quencher) approximately seven feet above the bottom of the suppression pool. This provides even heat distribution in the suppression pool and reduced dynamic forces on the suppression chamber.
24. Which ONE (1) of the following describes the Main Steam Lines instrumentation in the MSIV Pit?
- ✓A. The MSIV pit has temperature monitoring instrumentation intended to initiate a PCIS Group I Isolation signal on a detected steam leak in the Reactor Building.
  - B. The MSIV Pit has both temperature and pressure monitoring instrumentation intended to initiate a PCIS Group I Isolation signal on a detected steam leak in the Turbine Building.
  - C. The MSIV Pit has temperature monitoring instrumentation intended to initiate a PCIS Group I Isolation signal on a detected steam leak in the Turbine Building.
  - D. The MSIV Pit has both temperature and pressure monitoring instrumentation intended to initiate a PCIS Group I Isolation signal on a detected steam leak in the Reactor Building.

25. Unit One (1) is starting up following refueling. Main Turbine roll is in progress with Turbine speed at 1600 RPM.

The Main Turbine will trip if which ONE (1) of the following occurs?

- A. EHC System DC power is lost.
- B. Bearing #3 vibration rises to 10 mils.
- C. Stator water cooling inlet pressure is 50 psig.

✓D. Main Shaft Oil Pump discharge pressure is 100 psig.

26. If Feedwater Heater 4A drain valve failed in the closed position, which ONE (1) of the following would result?

- A. A decreased Heater Drain flow, increased Condensate flow, and higher Condensate System pressures.
- B. An increased Heater Drain flow, decreased Condensate flow, and lower Condensate System pressures.

✓C. A decreased Heater Drain flow, increased Condensate flow, and lower Condensate System pressures.

D. An increased Heater Drain flow, decreased Condensate flow, and higher Condensate System pressures.

27. Unit 1 is operating at 100% power. Reactor Feedpump MGUs have been placed in MANUAL due to misoperation of the Master Controller. You are monitoring the operation of Condensate and Feedwater System in the Control Room.

You note the following parameters:

Condensate Pump discharge pressure is 180 psig.  
Condensate Booster Pump suction pressure is 165 psig.  
Condensate Booster Pump discharge pressure is 366 psig.  
Reactor Feed Pump suction pressure is 225 psig.  
Reactor Feed Pump discharge pressure is 900 psig.  
North Hotwell A level is - 1.5 inches.  
South Hotwell A level is + 1.5 inches.  
North Hotwell B level is - 1.5 inches.  
South Hotwell B level is +1.5 inches.  
Feedwater line to reactor temperatures is approximately 400 °F

Which ONE (1) of the following actions should you take to restore all parameters to their normal operating band?

- ✓A. Restore Reactor Feed Pump discharge pressure, it is too low for this power level.
- B. Restore Reactor feed Pump suction pressure, it is too low for this power level.
- C. Restore Condensate Booster Pump suction pressure, it is too high for this power level.
- D. Restore Condensate Pump suction pressure, it is too high for this power level.

28. The feedwater master control station (C32-SIC-R600) was set in MASTER AUTO. A full scram signal is received on both A and B channels as indicated by the backup scram valve relays being energized from the RPS logic. Following this scram which ONE (1) of the following describes how the feed water master control station responds?

- A. The LVLERR calculation block outputs a level setpoint of 182" and removes the 3 element permissive.
- B. The LVLERR calculation block outputs a level setpoint of 182" and retains the 3 element permissive.
- ✓C. The LVLERR calculation block outputs a level setpoint of 170" and removes the 3 element permissive.
- D. The LVLERR calculation block outputs a level setpoint of 170" and retains the 3 element permissive.

29. The Main Stack Radiation Upscale Hi-Hi has just come into alarm. Which ONE (1) of the following describes the status of the SBGT system and the basis for this status?
- A. Tech Specs and Environmental Qualification concerns for the stack radiation monitor following a high energy line break (HELB) requires SBGT to automatically initiate on this signal.
  - B. Tech Specs requires SBGT to initiate on this signal. However, due to the connection between the group 6 isolation logic and the SBGT start circuits, the SBGT System will not initiate automatically.
  - C. Tech Specs do not require SBGT to initiate on this signal. However, due to Environmental Qualification concerns for the stack radiation monitor following a high energy line break the system must be initiated manually.
  - D. Tech Specs do not require SBGT to initiate on this signal. However, due to the connection between the group 6 isolation logic and the SBGT start circuits, the SBGT system will initiate automatically.
30. The EDG is in auto mode. The operator parallels the EDG with the BOP bus. The EDG tried to pick up the entire grid and become instantaneously overloaded. Which ONE (1) of the following would cause this to happen?
- A. The EDG governor was in the ISOCHRONOUS mode.
  - B. The EDG governor was in the DROOP mode.
  - C. The EDG was synchronized 180 degrees out of phase.
  - D. The EDG was already connected to an E-bus.
31. The Battery Room Ventilation system is inadvertently secured during an equalizing charge of the Division I 125/250 VDC Batteries. The room temperature is 79°F and slowly rising. You are directed to secure the equalizing charge. Which ONE (1) of the following describes the basis for this action?
- A. To prevent a fire and explosion hazard.
  - B. To retain the specific gravity of the batteries.
  - C. To ensure the proper alignment of the vortex dampers.
  - D. To prevent damage to the pilot cell.

32. EDG 3 was stopped using the Emergency Stop pushbutton following a routine run. The DG lockout relay energized and the RTGB module NOT AVAILABLE light is illuminated at Panel XU-2.

If the main generator trips on reverse power, EDG 3 will do which ONE (1) of the following?

- A. Start immediately.
- B. Not start under any circumstance.
- C. Start immediately only after the DG lockout is manually reset.
- D. Start 20 seconds after the DG lockout is reset by the auto start logic.

33. Unit 2 is in plant startup at 2% rated thermal power.

Mechanical vacuum pumps are used to provide initial evacuation of the main condenser shell. Which ONE (1) of the following describes the non-condensibles flow path?

- A. The non-condensibles are evacuated via a 1.8-minute holdup volume, bypassing the AOG System prior to transport to the Main Stack.
- B. The non-condensibles are evacuated via a 30-minute holdup volume, bypassing the AOG System prior to transport to the Main Stack.
- C. The non-condensibles are evacuated via the AOG Building. They are admitted to a refrigerated cooler condenser where the stream is cooled and dehumidified by passing through coils immersed in a refrigerated glycol bath prior to transport to the Main Stack.
- D. The non-condensibles are evacuated via an off-gas recombiner, a condenser to remove moisture, a 30-minute delay pipe prior, then to the AOG System prior to transport to the Main Stack.

34. Failure of the DC power supply in the ARM System will cause which ONE (1) of the following?

- A. Upscale HI alarm.
- B. Upscale HI HI alarm.
- C. Downscale alarm.
- D. Detector alarms, but the indication fails as is.

35. Which ONE (1) of the following is the purpose of the two jockey pumps in the fire suppression system?

- ✓A. To supply water to the fire main to prevent the fire pumps from starting during normal conditions.
- B. To supply water to the Fire Protection Water Tank from the Brunswick County water supply.
- C. To supply water to the Fire Protection Water Tank from the Well Water System wells.
- D. To supply water to the main fire header, if the fire pumps cannot maintain system pressure.

36. Following a LOCA, the four 72" Emergency Butterfly Isolation dampers located in the RB HVAC receive an isolation signal. Which ONE (1) of the following describes the two requirements of these dampers in performing their safety function?

- A. They must close within four seconds and must fail closed on loss of pneumatics and/or loss of power.
- B. They must close within sixty seconds and must fail closed on loss of pneumatics and/or loss of power.
- ✓C. They must close within four seconds and must remain closed for the duration of the accident, which is 30 days in the LOCA analysis.
- D. They must close within sixty seconds and must remain closed for the duration of the accident, which is 30 days in the LOCA analysis.

37. Which ONE (1) of the following is correct concerning the head to vessel flange seal single o-ring failure?

- A. Failure of the outer o-ring flange seal is detected by the primary containment leak detection system.
- B. Failure of the inner o-ring flange seal is detected by the primary containment leak detection system.
- ✓C. Failure of the inner o-ring flange seal is detected by an annunciator, A-02 5-6 RPV FLANGE SEAL LEAK.
- D. Failure of the outer o-ring flange seal is detected by an annunciator, A-02 5-6 RPV FLANGE SEAL LEAK.

38. There is a small fire in the Main Control Room kitchen. The fire is limited to the inside of the microwave, but has produced a great deal of smoke. The SCO anticipates an automatic start signal and places the "A" filtering train control switch to the ON position which initiates a starting sequence for the CREV fan.

Approximately 10 minutes after this occurs, a high radiation level, unrelated to this event generates a CREV initiation signal. Which ONE (1) of the following describes how the CREV will operate upon receipt of this initiation signal?

- A. The washroom fan does not get a trip signal.
  - B. The mechanical equipment room fans do not get a trip signal.
  - C. The cable spreading room fans do not get a trip signal.
  - D. The B CREV fan does not auto start.
39. The primary natural circulation flow has reduced following an abnormal transient. Natural circulation can continue provided which ONE (1) of the following occurs?
- A. A closed recirculation loop exists between the core bypass region and the boiling region within the fuel channel due to the difference in the water's density, as long as water is available in the upper plenum region.
  - B. Water above the peripheral fuel bundles of the core is subcooled due to the low decay heat production from these bundles. Natural circulation will occur due to this dense water flowing upward through the peripheral bundles to the core inlet plenum.
  - C. A closed recirculation loop exists between the upper plenum region and the boiling region within the fuel channel due to the difference in the water's density, as long as water is available in the core bypass region.
  - D. Water below the peripheral fuel bundles of the core is subcooled due to the low decay heat production from these bundles. Natural circulation will occur due to this dense water flowing upward through the peripheral bundles to the core inlet plenum.

40. Unit 1 is operating at 74% power.

The inlet to the condensate filter/demins is maintained at 140°F.

Two of three operating circulating water pumps trip.

In accordance with 0AOP-37.0, Low Condenser Vacuum, which ONE (1) of the following are your immediate actions?

A. MANUALLY SCRAM the reactor and ENTER EOP-01.

B. RESTART a circulating water pump, REDUCE reactor power, as necessary, to maintain condenser vacuum greater than 25" Hg. If a more rapid power reduction is desired, the SCO may direct the use of Select Rod Insert.

✓C. RESTART a circulating water pump, REDUCE reactor power, as necessary, to maintain condenser vacuum greater than 25" Hg. If a more rapid power reduction is desired, the SCO may not direct the use of Select Rod Insert.

D. RESTART a circulating water pump, REDUCE reactor power, as necessary, to maintain condenser vacuum greater than 25" Hg. Open FW-FV-177 Inlet Isolation Valve, FW-V10 and THROTTLE OPEN Condensate/Feedwater Cleanup Recirculation Valve.

41. The crew has entered 0AOP-36.2, Station Blackout. Containment pressure is 22 psig. There is some indication fuel failure is imminent. One Diesel Generator has been restored and is supplying ALL AC power. The crew is attempting to re-establish core cooling, but has not yet been successful.

The crew has reached the step in AOP-36.2 requiring entry into Section 3.2.18, Total Containment Isolation. Which ONE (1) of the following actions is required?

✓A. Isolate containment.

B. Reduce containment pressure, to less than 15 psig, then isolate containment.

C. Restore core cooling, then isolate containment.

D. Do not isolate containment until, core cooling has been reestablished and containment pressure has been lowered or there is evidence of fuel damage.

42. Unit 1 has just received annunciator A-3 2-2 AUTO DEPRESS CONTROL POWER FAILURE. Subsequent investigation reveals no light indication for any ADS/SRV at panel P601.

Based on these indications which ONE (1) of the following is the probable cause and how is ADS/SRV operation affected?

- A. Loss of DC power supply from panel 3A only. ADS Logic "B" and ADS/SRV solenoids have normal power from panel 3B. ADS and SRV pressure relief will function.
  - B. Loss of DC power supply from panel 3B only. ADS Logic "B" and ADS/SRV solenoids have alternate power from panel 3A. ADS and SRV pressure relief will function.
  - ✓C. Loss of DC power supply from panel 3A and 3B. ADS logics and ADS/SRV solenoids have no power. SRV pressure relief will function.
  - D. Loss of DC power supply from panel 3A and 3B. ADS logics and ADS/SRV solenoids except SRV "D" have no power. SRV pressure relief will function and SRV "D" is operable from Panel P601.
43. Unit 1 is operating at 100% power (EOC) when the main turbine generator trips. Following the closure of the TSV's, in accordance with the UFSAR transient analysis, which ONE (1) of the following describes the Unit's immediate (within the first two seconds) response?

With the TSVs shut . . .

- A. reactor pressure rises rapidly, collapsing voids. Negative reactivity is added, reactor power decreases and RPV level decreases. Control rods insert additional negative reactivity to shutdown the reactor. BPVs open as steam line pressure increases, SRVs open.
- B. steam line pressure increases, BPVs open, reactor pressure begins to decrease and RPV level increases. Positive reactivity is added as void production increases, reactor power increases before control rods can insert enough negative reactivity to shutdown the reactor. SRVs open.
- C. steam line pressure increases, collapsing voids. RPV level increases, positive reactivity is added and reactor power increases before control rods can insert enough negative reactivity to shutdown the reactor. BPVs open as steam line pressure increases, SRVs open.
- ✓D. reactor pressure rises rapidly, collapsing voids. RPV level decreases and positive reactivity is added and reactor power increases before control rods can insert enough negative reactivity to shutdown the reactor. RPV level decreases due to the initial pressurization. BPVs open as steam line pressure increases, SRVs open.

44. Unit 2 is operating at 24% power with the generator synchronized to the grid. BOP buses 2C and 2D have been transferred to the UAT. Alarm A-5 6-8 TURB CV CLOS/SV/RPT TRIP BYPASS is sealed in.

A main turbine trip occurs resulting in a generator backup lockout and a fast transfer of BOP buses 2C and 2D to the SAT. The reactor does NOT scram and no diesel generators auto start.

The operators should do which ONE (1) of the following:

- A. immediately insert a manual reactor scram.
  - B. depress the auto start pushbutton on all four diesel generators.
  - C. depress the auto start pushbutton on diesel generators #3 and #4 only.
  - D. maintain present power, determine and correct the cause of the turbine trip.
45. While Unit 2 was operating at full power, a transient caused four (4) SRVs to open. Pressure is observed to be 1131 psig. Power remains near 100 percent. Which ONE (1) of the following protective functions have failed to occur as a result of high reactor pressure?
- A. Reactor Protection System scram ONLY.
  - B. Reactor Protection System scram AND Alternate Rod Insertion scram ONLY.
  - C. Reactor Protection System scram AND Recirculation Pump Trip ONLY.
  - D. Reactor Protection System scram, Alternate Rod Insertion scram AND Recirculation Pump Trip.
46. A plant transient occurred resulting in the loss of normal feedwater. The reactor operator observes the REACTOR WATER LEVEL HIGH/LOW annunciator alarming. The Reactor Water Cleanup System isolation valves have closed on low reactor water level.
- Which ONE (1) of the following is the expected status of the Reactor Recirculation Pumps?
- A. Both pumps are operating at Speed Limiter #1.
  - B. Both pumps are operating at Speed Limiter #2.
  - C. Both pump drive motor breakers are tripped.
  - D. Both pumps are operating with the scoop tubes locked.

47. Unit 2 was operating at 100% power.

A large break LOCA has occurred in containment.

Which ONE (1) of the following describes what will happen with the vessel level instrument legs?

- ✓A. The compensated level instrument legs are at a higher temperature than the uncompensated legs, the compensated level instrument legs will boil first.
- B. The uncompensated level instrument legs are at a higher temperature than the compensated legs, the uncompensated level instrument legs will boil first.
- C. Both instrument legs are at the same temperature. There is a thermal time constant of approximately 4 to 6 minutes for the uncompensated legs, the compensated level instrument legs will boil first.
- D. Both instrument legs are at the same temperature. There is a thermal time constant of approximately 4 to 6 minutes for the compensated legs, the uncompensated level instrument legs will boil first.

48. When directed from EOP-01, HPCI suction transfer logic is defeated per EOP-01-SEP-10 in order to do which ONE (1) of the following:

- ✓A. ensure that HPCI cooling is maintained.
- B. maintain HPCI suction aligned to the CST under all conditions.
- C. allow HPCI operation in pressure control with an initiation signal present.
- D. ensure that HPCI can be aligned for Alternate Boron Injection per EOP-01-LEP-03.

49. A Condensate header rupture in the Cable Spread area has resulted in a loss of both RPS distribution panels and a Reactor scram. Plant conditions:

23 control rods have failed to fully insert  
137 blue scram lights are lit on the full core display

Which ONE (1) of the following methods of Alternate Control Rod Insertion per LEP-02 is available?

- A. Vent the scram air header.
- ✓B. Insert control rods using RMCS.
- C. Utilize repeated manual scrams.
- D. Scram control rods using single rod scram.

50. Following a high offsite release, the site has implemented the Emergency Plan. An AO is needed to perform a task in the Reactor Building to align a system required for adequate core cooling. In accordance with OPEP-03.7.6, Emergency Exposure Control, which ONE (1) of the following guidelines do NOT apply?

- ✓A. Radiation exposures may exceed the BNP administrative exposure guides, but shall remain less than the radiation exposure limits in 10CFR20.
- B. The risk of not performing the task shall be evaluated against the anticipated or allowable exposure.
- C. Personnel should not enter any area where dose rates are unmonitored or immeasurable without Radiological Controls coverage.
- D. Dosimetry equipment capable of measuring the anticipated maximum exposure and type of radiation shall be worn by personnel receiving emergency exposures.

51. Unit One is operating at 65% power. The following alarms annunciate within approximately 5 minutes.

RBCCW PUMP DISCH HEADER PRESS LOW annunciates (UA-03, 2-5).  
RBCCW HEAD TANK LEVEL HI/LO annunciates (UA-03, 1-5).  
RBCCW HX OUTLET HDR TEMP HI annunciates (UA-03, 1-3)  
NON REGEN HX DISCH HI TEMP annunciates (A-02 4-6)  
RWCU isolates.

RBCCW discharge header pressure is stable at 66 psig.

Which ONE (1) of the following describes the actions required by OAOP-16.0 for this condition?

- ✓A. ENSURE that RBCCW discharge header pressure remains greater than 60 psig by starting available RBCCW pumps as needed AND isolate any identified leaks due to pipe rupture.
- B. TRIP all RBCCW Pumps, CLOSE RBCCW Containment Isolation Valves, RCC-V28 and RCC-V52, TRIP RWCU Pump(s), do not reduce the speed of both Reactor Recirculation Pumps to minimum, AND isolate any identified leaks due to pipe rupture.
- C. TRIP all RBCCW Pumps, CLOSE RBCCW Containment Isolation Valves, RCC-V28 and RCC-V52, and REDUCE the speed of both Reactor Recirculation Pumps to minimum.
- D. TRIP all RBCCW Pumps, CLOSE RBCCW Containment Isolation Valves, RCC-V28 and RCC-V52, and REDUCE the speed of both Reactor Recirculation Pumps to minimum, Manually SCRAM the reactor, ENTER Reactor Scram Procedure, EOP-01-RSP, TRIP both Reactor Recirculation Pumps AND isolate any identified leaks due to pipe rupture.

52. If the noninterruptable instrument air system pressure begins to lower, which ONE (1) of the following occurs at a pressure of 95 psig?

- ✓A. The Standby Reactor Building air compressors start.
- B. PNS isolates and the Backup Nitrogen Rack Isolation Valves open to align the nitrogen bank.
- C. Air Compressors A, B, and C start and then load.
- D. PV-706-1 and PV-706-2 close to isolate the service air header.

53. Unit 2 is shut down, with Shutdown Cooling in service on the "B" loop of RHR. Core Spray loop "A" is considered the primary source of RPV makeup. CS "A" is in a normal standby lineup except that BOTH the Inboard Injection valve, E21-F005A, and the Outboard Injection Valve, E21-F004A, are CLOSED.

A small break LOCA causes the isolation of Shutdown Cooling. Core Spray injection is required to maintain RPV level. RPV level is currently 80 inches. Drywell pressure is 1.5 psig. The "2A" CS pump is started and the E21-F005A valve is OPENED. When the control switch for the E21-F004A is taken to open, the valve remains closed.

Which ONE (1) of the following action(s) should be taken to establish an injection flowpath?

- A. The F004A valve must be opened locally.
- B. The F004A valve can only be open when the LL3 signal is received.
- C. An initiation signal must be received before the F004A and F005A can be opened simultaneously.
- ✓D. The F005A valve should be shut. The F004A valve can then be opened; and the F005A valve reopened.

54. Unit 2 plant conditions:

RPV level	+170 inches
RPV pressure	950 psig
Drywell pressure	2.5 psig
RFPs	Tripped/unavailable
RCIC	Isolated due to clearance
HPCI	Injecting to the RPV

There is a complete loss of power from Division I, DC switchboard 2A. Which ONE (1) of the following will occur?

- A. HPCI will not maintain level.
- B. A Half Reactor Scram Signal only is received.
- C. A Group 1 Isolation with Outboard MSIV's only occurred.
- D. A Group 1 Isolation with both Inboard and Outboard MSIV's occurred.

55. While operating at 100% power, the following occurs automatically within the RPS System:

K5A is deenergized

K5C is energized

K14A and E are deenergized

K14C and G are energized

The SV-117 Scram Pilot Solenoid Valves (Group I, II, III, and IV) are deenergized.

The SV-118 Scram Pilot Solenoid Valves (Group I, II, III, and IV) are energized.

Which ONE (1) of the following has sensed a High Reactor Pressure?

- A. N023A
- B. N023B.
- C. N023C.
- D. N023D.

56. Following a line break in the Unit One (1) drywell, plant conditions are:

RPV water level	180" steady on N026A/B
RPV water level	155" steady on N004A/B/C
RPV water level	190" steady on N027A/B
RPV pressure	50 psig
Drywell ref leg temp	340°F
Drywell average temp	255°F

RPV water level may be determined using by which ONE (1) of the following?

- A. N026A/B only.
- B. N026A/B and N027A/B only.
- ✓C. N026A/B and N004A/B/C only.
- D. N026A/B and N027A/B and N004A/B/C.

57. During a Unit Two (2) accident, a fuel failure occurs. Emergency Depressurization is required. Plant conditions are:

RPV water level	<LL4
MSIVs	Closed by direction of RRCP
RPV pressure	1100 psig
RCIC	Injecting to the RPV
HPCI	Injection valve will not open
SRVs	Cannot be opened, cycling on lift setpoint

The operating crew should enter EOP-01-AEDP and do which ONE (1) of the following?

- A. operate HPCI in pressure control.
- B. operate HPCI and RCIC in pressure control.
- C. determine that the reactor cannot be depressurized and enter SAMG-01.
- ✓D. bypass all Group 1 isolations, then rapidly depressurize to the Main Condenser.

58. Which ONE (1) of the following Emergency Operating Procedure limits allows peak fuel clad temperature to exceed 1500°F?
- A. Maximum Core Uncovery Time Limit.
  - B. Minimum Alternate Flooding Pressure.
  - ✓C. Minimum Zero-Injection Reactor Water Level.
  - D. Minimum Steam Cooling Reactor Water Level.
59. Unit 1 has experienced an accident that resulted in a loss of all Reactor Water Level Instrumentation. The reactor has been shutdown for fifteen (15) hours.
- Conditions of Reactor Flooding Procedure (EOP-01-RXFP) have been established that allow terminating all injection to the reactor vessel.
- The Maximum time injection may be terminated without being able to determine Reactor Water Level is approximately which ONE (1) of the following?
- A. 4.0 minutes.
  - B. 6.0 minutes.
  - ✓C. 8.0 minutes.
  - D. 14.0 minutes.
60. Which ONE (1) of the following is the basis for the Main Steam Line Tunnel high temperature isolation?
- A. protect the integrity of the secondary containment and ensure the continued operability of safe shutdown equipment.
  - ✓B. minimize radioactive releases to the environment and limit the inventory loss from the reactor under all accident conditions.
  - C. prevent exceeding the Environmental Qualification temperature limits on the MSIV control air solenoids.
  - D. limit the escape of radioactivity from the MSL Tunnel to the Reactor Building HVAC system.

61. The Drywell Purge Exhaust Fans will trip and the isolation valves will close on which ONE (1) of the following?

A. Reactor Building Roof Vent Radiation Hi-Hi (CAC-AQH-1264).

✓B. Any SBTG Auto Initiation signal.

C. Reactor Building isolation damper closure.

D. Any PCIS Group 6 isolation signal.

62. Refueling is in progress on Unit 1. The PROCESS RX BLDG. VENT RAD HI-HI (UA-03 3-5) has just alarmed.

THEN the following actions occur:

Reactor Building ventilation isolates

SBGTs auto starts

Group 6 valves auto isolate

Which ONE (1) of the following has occurred?

A. HELB is present in the Reactor Building.

B. HELB is present in containment.

C. Reactor Building sprinkler system has malfunctioned.

✓D. New or Spent fuel has been damaged.

63. Reactor building pressure is an entry condition into the Secondary Containment Control Procedure (SCCP); however, it is not a parameter which has any directly associated operator actions. Which ONE (1) of the following is the basis for this?

✓A. Only a small operating margin exists between its normal operating value and the pressure at which the secondary containment blowout panels release.

B. Only a small operating margin exists between its normal operating value and the automatic isolation of Reactor Building HVAC.

C. This procedure is only entered after the secondary containment blowout panels release.

D. This procedure is only entered after the automatic or manual isolation of Reactor Building HVAC.

64. During an ATWS on Unit ~~Two (2)~~ <sup>ONE (1)</sup> ~~plant~~ <sup>2/27/01</sup> conditions are:

RPV water level	-60" (N036/N037)
APRMs	Downscale
RPV pressure	750 psig, lowering
SRVs	One valve failed open
Drywell ref leg temp	205°F
SLC	Injecting boron (two pumps)
CRD	Two pumps running
HPCI	Injecting @ 1000 gpm

Assuming that RPV water level remains constant as RPV pressure continues to lower, emergency depressurization must be performed when RPV pressure drops below which ONE (1) of the following?

- A. 275 psig, HPCI must be terminated and prevented prior to depressurization.
- ✓B. 650 psig, HPCI must be terminated and prevented prior to depressurization.
- C. 275 psig, HPCI may continue to inject during depressurization.
- D. 650 psig, HPCI may continue to inject during depressurization.

65. Following a seismic event in which Unit Two (2) has lost offsite power, plant conditions are as follows:

APRM downscales	illuminated
Control Rods	64 not full in
SLC Squib valves	failed to fire
CST level	2' ; the CST is ruptured
RPV Level	50" ; RCIC running on torus suction
CRD Pump A	Under clearance
DG3	Running, tied to E3
DG4	Tripped on differential overcurrent
E7-E8	Cross-tied

Which ONE (1) of the following methods of EOP-01-LEP-03, Alternate Boron Injection, must the operator use to inject boron?

- A. CRD System.
- B. HPCI and/or RCIC.
- ✓C. RWCU System.
- D. Condensate System.

66. Ingestion Exposure Pathway is defined as:

- A. a generic area designed about a nuclear plant to facilitate emergency planning off-site.
- ✓B. the 50-mile pathway of radioactive materials to the public through the consumption of radiologically contaminated water and food.
- C. the 10-mile pathway of radioactive materials to the public through whole body exposure from the plume and from deposited materials, and inhalation of radioactive materials.
- D. a radiological release that results in the projected accumulated internal dose to members of the general public exceeding the limits set by the Federal Food and Drug Administration (FDA) which warrants consideration of protective measures.

67. Unit 2 is operating at rated power. A Scram Valve Pilot Air Header Pressure Hi/Low alarm is received. The cause is determined to be plugging of the in-service filter. The AO has attempted to place the standby scram air header filter in service, but the outlet isolation valve is bound closed.

Which ONE (1) of the following describes the impact of lowering scram air header pressure as the filter continues to plug?

- A. Scram Discharge Volume Vent and Drain Valves fail open, CRD Flow Control Valve fails as is.
- B. Scram Discharge Volume Vent and Drain Valves fail closed, CRD Flow Control Valve fails as is.
- C. Scram Discharge Volume Vent and Drain Valves fail open, CRD Flow Control Valve fails closed.
- ✓D. Scram Discharge Volume Vent and Drain Valves fail closed, CRD Flow Control Valve fails closed.

68. Which ONE (1) of the following listed loads, is the largest load on the RBCCW system during normal full power operations?

- A. Reactor Recirculation System Pump Coolers and Motor Coolers.
- B. Fuel Pool Heat Exchangers A and B.
- C. Reactor Water Cleanup.
- ✓D. Drywell Cooling.

69. During accident conditions, Primary Containment is vented per SEP-01 due to hydrogen concentrations in the drywell above minimum detectable.

Which ONE (1) of the following describes why is it preferred to vent from the suppression chamber if the hydrogen is in the drywell?

- A. Faster dilution of the hydrogen gas.
- ✓B. Minimizes offsite radioactive release rates.
- C. Condenses any steam from the drywell atmosphere.
- D. Prevents operation of the torus to drywell vacuum breakers.

70. You are a member of the fire brigade. You are informed that you are responding to a Class D fire. Which ONE (1) of the following describes the fire that you will likely encounter?

- A. wood, paper and cloth.
- ✓B. combustible metals.
- C. flammable liquids, greases, and gases.
- D. energized electrical equipment.

71. Unit One (1) startup is in progress in accordance with GP-03. Verification of Reactor power using alternate indications, was performed with the following conditions:

APRMs	13% Power
Bypass Valve	17% Equivalent Power
Steam Flow	18% Equivalent Power
LPRM	19% Power
Heat Balance	11% Power

Which ONE (1) of the following describes the effects on Power ascension? Power ascension may:

- A. continue without APRM GAF adjustment.
- ✓B. continue only if APRM GAFs are adjusted to at least 17% power.
- C. continue only if APRM GAFs are adjusted to at least 19% power.
- D. not continue, contact STA to account for differences.

72. An Auxiliary Operator has received 1.75 Rem TEDE for the current year. The AO is needed to perform work in a 20 mrem/hr field. The work is expected to last 1.5 hours.

In accordance with NGG-MPM-0002, Radiation Control and Protection Manual, the worker requires which ONE (1) of the following?

- A. no special authorization since the annual administrative limit should not be exceeded.
- B. authorization from the Manager E&RC since the annual administrative dose limit will be exceeded.
- C. authorization from the Plant General Manager since the annual administrative dose limit will be exceeded.
- D. authorization from the Site Vice President since the annual administrative dose limit will be exceeded.

73. Which ONE (1) of the following is the Design Basis Accident (DBA) that results in the highest Exclusion Area Thyroid Dose?

- A. Refueling Accident.
- B. Control Rod Drop Accident.
- C. Main Steam Line Break Accident.
- D. Loss of Coolant Accident.

74. Following a Recirculation Pump trip, entry into AOP-04.0 is required. The Reactor Operator is directed to insert control rods per ENP-24 to exit the Restricted Region of the power/flow map.

ENP-24 directs inserting a group of rods from position 40 to 12.

Per the Reactivity Management Guidelines of OI-01.02, these rods should be inserted using continuous insert to which ONE (1) of the following positions?

- A. 12, monitoring of rod selection and movement by a second Licensed operator or qualified individual is required.
- B. 12, monitoring of rod selection and movement by a second Licensed operator or qualified individual may be waived.
- ✓C. 14, then notched to 12, monitoring of rod selection and movement by a second Licensed Operator or qualified individual is required.
- D. 14, then notched to 12, monitoring of rod selection and movement by a second Licensed Operator or qualified individual may be waived.

75. Which ONE (1) of the following is correct with regards to EOP flow chart usage?

- A. If the decision step status changes after being assessed, you are required to return to that step and perform new action.
- B. If the critical step status changes after assessed, a return to that step is permitted, but not required until the flow path is complete.
- ✓C. If any step cannot be executed, it should be circled and returned to later when it can be executed.
- D. If the critical step status or the decision step status changes after assessed, you are required to complete the flow path and then return to that step and perform new action.

76. Control rod INSERTION using the "EMERGENCY IN" position of the Rod Out Notch Override switch will bypass which ONE (1) of the following?

- A. a Select Block.
- B. an RWM Insert Block.
- C. the normal "drive-in bus".
- ✓D. the normal settle function.

77. Which ONE (1) of the following signals will cause a partial Group 3 Reactor Water Cleanup (RWCU) isolation?

- A. High differential flow.
- B. Low low reactor water level.
- C. Area ventilation delta T high.
- ✓D. Nonregenerative Hx outlet temperature high.

78. If the local average signal exceeds the reference trip setpoint then the RBM "trips" and initiates a rod withdrawal block in the Reactor Manual Control System (RMCS). Which ONE (1) of the following describes how the RBM determines the reference trip set point?

- ✓A. by referencing an APRM signal for core average power ONLY.
- B. by referencing the "A" level LPRM signals for core average power ONLY.
- C. by referencing the "B" and "D" level signals for core average power ONLY.
- D. by referencing the "A", "B", "C" and "D" level string for core average power ONLY.

79. With the unit at 50% power, and control rod withdrawal in progress, which ONE (1) of the following is enough to initiate a rod block?

- A. 25% of the LPRM inputs required by the count circuit are downscale.
- ✓B. One RBM channel trip signal supplied to RMCS.
- C. The gain change circuit increases to 104% of scale.
- D. The gain change circuit decreases to 96% of scale.

80. With the Core Spray system in standby alignment, a break in the injection line between the reactor vessel penetration and the core shroud would do which ONE (1) of the following?
- A. Expose the low pressure side of the Core Spray Sparger Line Break Detection instrument to the higher pressure of the region outside the shroud. This would be sensed as an decreased differential pressure and would activate a Control Room annunciator only.
  - B. Expose the low pressure side of the Core Spray Sparger Line Break Detection instrument to the higher pressure of the region outside the shroud. This would be sensed as an decreased differential pressure and would activate a Control Room annunciator and local DP indication.
  - ✓C. Expose the low pressure side of the Core Spray Sparger Line Break Detection instrument to the lower pressure of the region outside the shroud. This would be sensed as an increased differential pressure and would activate a Control Room annunciator and local DP indication.
  - D. Expose the low pressure side of the Core Spray Sparger Line Break Detection instrument to the lower pressure of the region outside the shroud. This would be sensed as an increased differential pressure and would activate a Control Room annunciator only.
81. Which ONE (1) of the following is a design basis of ADS ?
- A. The pressure relief system prevents overpressurization of the Primary Containment system in order to prevent failure of the process barrier due to high pressure. The automatic depressurization function is NOT dependent on the availability of LPCI and/or Core Spray.
  - B. The pressure relief system prevents overpressurization of the Primary Containment system in order to prevent failure of the process barrier due to high pressure. The automatic depressurization function is dependent on the availability of LPCI and/or Core Spray.
  - C. The pressure relief system prevents overpressurization of the Primary Coolant system in order to prevent failure of the process barrier due to high pressure. The automatic depressurization function is NOT dependent on the availability of LPCI and/or Core Spray.
  - ✓D. The pressure relief system prevents overpressurization of the Primary Coolant system in order to prevent failure of the process barrier due to high pressure. The automatic depressurization function is dependent on the availability of LPCI and/or Core Spray.

82. Following a LOCA, which included a group 6 isolation, the Containment Hydrogen/Oxygen monitors have been placed in service.

After placing the monitors in service, the following alarms and indications occur:

Reactor Building Vent Rad Hi alarm sealed in  
Reactor Building Vent Rad Hi Hi alarm sealed in  
Reactor Building Vent Radiation recorder channel A pegged high  
Reactor Building Vent Radiation recorder channel B 0.5 mr/hr

Which ONE (1) of the following describes how this failure affects the Hydrogen/Oxygen (H<sub>2</sub>/O<sub>2</sub>) monitors?

- ✓A. Both Division I and II H<sub>2</sub>/O<sub>2</sub> monitors remain in service.
- B. Only Division I H<sub>2</sub>/O<sub>2</sub> monitor isolates, but can be placed back in service.
- C. Only Division I H<sub>2</sub>/O<sub>2</sub> monitor isolates, and cannot be placed back in service.
- D. Both Division I and II H<sub>2</sub>/O<sub>2</sub> monitors isolate, but can be placed back in service.

83. The following is a list of Unit 1 Main Turbine trips:

Exhaust Hood Temperature Trip  
Low Stator Coolant Inlet Pressure Trip  
High Stator Coolant Outlet Temperature Trip  
Low Stator Cooling Water Flow Trip

Which ONE (1) of the following do all of these trips have in common?

- ✓A. They all have time delays.
- B. They are all 2 out of 2 coincidence.
- C. They are all 2 out of 3 coincidence.
- D. They all have RTGB bypass switches.

84. Unit One is at 100% power with the Digital Feedwater Control System in 3 ELEMENT and the Reactor Water Level Select Switch in LEVEL A (N004A).

Which ONE (1) of the following describes how the Digital Feedwater Control System will respond to level instrument N004A failing low?

- ✓A. Remain in 3 ELEMENT and utilize the B level instrument (N004B) for level control.
- B. Remain in 3 ELEMENT and utilize the C level instrument (N004C) for level control.
- C. Transfer to 1 ELEMENT and utilize the B level instrument (N004B) for level control
- D. Transfer to 1 ELEMENT and utilize the C level instrument (N004C) for level control.

85. If the vital UPS unit four position Manual Bypass Switch (S1) is placed in the BYP TEST position, which ONE (1) of the following describes the status of the static transfer switch?

- A. The switch is bypassed with the alternate AC source being routed to the UPS unit output (B1 closed and B2 open). The alternate AC source is removed from the static transfer switch (B3 open). The sync reference is applied to the sync circuit permitting the inverter to come into synchronization with the alternate AC source during UPS unit startup (B4 closed).
- B. The switch is bypassed with the alternate AC source being routed to the UPS unit output (B1 open and B2 closed). The alternate AC source is removed from the static transfer switch (B4 open). The sync reference is applied to the sync circuit permitting the inverter to come into synchronization with the alternate AC source during UPS unit startup (B3 closed).
- ✓C. The switch is bypassed with the alternate source being routed to the UPS unit output (B1 closed and B2 open). The UPS unit is being maintained in a standby status with its inverter synchronized with the alternate AC source.
- D. The switch is bypassed with the alternate source being routed to the UPS unit output (B1 open and B2 closed). The UPS unit is being maintained in a standby status with its inverter synchronized with the alternate AC source.

86. Which ONE (1) of the following initiates Control Building Ventilation in the radiation protection mode?

- A. 1 mr/hr measured at either air intake duct detector.
- B. 1 mr/hr measured by the area radiation monitor in the Control Building 23'.
- C. 1 mr/hr measured at both of the air intake duct detectors.
- ✓D. 1 mr/hr measured by the area radiation monitor in the Control Room.

87. Unit 1 is at 100 % power.

Drywell average air temperature is 148°F and increasing as read on CAC-TR-4426-1 and CAC-TR-4426-2A, Channel 2, located on Panel XU-3.

Drywell average air temperature is 147°F and increasing as read on CAC-TY-4426-1 and CAC-TY-4426-2, located in the back panels.

Which ONE (1) of the following procedures should the operating crew perform?

- ✓A. Enter 0AOP-14.0 and ensure that all available Drywell Coolers are operating in accordance with 1OP-37.1.
- B. Enter 0AOP-14.0 and ensure that TBCCW is correctly aligned to the drywell cooling units in accordance with 1OP-44.
- C. Enter EOP-02-PCCP and ensure drywell air temperature is reduced.
- D. Enter EOP-02-PCCP and ensure all purge exhaust fans are operating in accordance with 1OP-24.

88. Following an accident involving the release of high concentrations of chlorine, Unit 1 must be shutdown from the Reactor Building. Which ONE (1) of the following procedure(s) should be used to shutdown?

- ✓A. 0AOP-32.0 Plant Shutdown from Outside the Control Room.
- B. Alternative Safe Shutdown Procedure, 0ASSD-02, Control Building.
- C. 0GP-05, Unit Shutdown.
- D. 1EOP-01-RSP, Reactor Scram Procedure, then transition to 0GP-05, Unit Shutdown.

89. Unit 1 is in startup with a reactor pressure of 925 psig. The operating CRD pump has failed. Initial attempts to restart the CRD pump has also failed. The crew enters 0AOP-02.0 and takes appropriate actions.

Step 3.2.4 states:

IF unable to move control rods, THEN PERFORM the following:

1. IF the operating CRD Pump has failed, THEN RESTART the CRD Hydraulic System following loss of a CRD Pump in accordance with 1(2)OP-08.

a. IF reactor pressure is below 800 psig (e.g., during startup or shutdown evolutions), AND CRD pressure CANNOT be restored with either CRD Pump, THEN INSERT a manual reactor SCRAM.

Which ONE (1) of the following action(s) do you take?

A. INSERT a manual reactor SCRAM.

B. Lower reactor pressure to below 800 psig, then INSERT a manual reactor SCRAM.

✓C. Do NOT INSERT a manual reactor SCRAM, continue on with the procedure.

D. Leave 0AOP-02.0 and transition to 2OP-07 to move control rods.

90. A core reload sequence is in progress in accordance with 0FH-11, Refueling. The neutronic bridge has NOT yet been established. Which ONE (1) of the following describes the appropriate actions?

A. Fuel movement is not allowed until the bridge is established.

B. Fuel assemblies must be unloaded until the bridge is established.

✓C. Control rod withdrawal is not allowed until the bridge is established.

D. The refueling floor must be evacuated of all non-essential personnel until the bridge is established.

91. Following a LOCA, the reactor will not remain shutdown under all conditions without boron. The crew enters the Level/Power Control procedure. Suppression Pool temperature is 145°F and rising. The systems used for control of reactor water level must be operated to adequately cool the core and do which ONE (1) of the following?
- A. To maximize available Suppression Pool water volume to ensure a water source for ECCS systems.
  - B. To minimize boron dilution, ensure cold water injection and continue HPCI flow to promote boron mixing.
  - ✓C. To minimize core inlet subcooling, thereby preventing or mitigating the consequences of any large irregular neutron flux oscillations induced by neutronic/thermal-hydraulic instabilities.
  - D. To minimize boron dilution, and maximize Suppression Pool level to ensure ECCS systems have adequate NPSH.

92. In EOP-01-SEP-02 the initiation of drywell sprays requires that the suppression pool water level to be below +21 inches.

Which ONE (1) of the following is the basis of this restriction?

- ✓A. Provides protection for the operation of the suppression chamber-to-drywell vacuum breakers.
  - B. Provides protection for NPSH for RCIC.
  - C. Provides protection for NPSH for HPCI.
  - D. Provides protection for NPSH for Core Spray Pumps.
93. Which ONE (1) of the following is the purpose of the 230 KV Power Line Carrier Phone Subsystem located in the Control Room on RTGB Panel XU-5?
- A. provides an additional backup to the Selective Signaling System. The system is used to contact the State and County Warning Points.
  - B. provides communications between the Technical Support Center, the Main Control Room and the remote shutdown panel.
  - ✓C. provides communications between the Brunswick Control Room and the substations located on the 230 KV transmission lines leaving BNP.
  - D. provides communications between the Technical Support Center, and the substations located on the 230 KV transmission lines leaving BNP.

94. When performing OAI-58.2, Equipment Control (EC) Tagging, which ONE of the following describes the minimum qualification of the persons who can approve and manipulate equipment to the restored position?
- A. With the Reactor Engineering's permission, qualified Operators shall manipulate the equipment to the restored position and EC tags.
  - B. With the Unit SCO's permission, qualified Maintenance Personnel shall manipulate the equipment to the restored position and EC tags.
  - C. With the SRO's permission, qualified Maintenance Personnel shall manipulate the equipment to the restored position and EC tags.
  - D. With the SRO's permission, qualified Operators shall manipulate the equipment to the restored position and EC tags.
95. OOI-01.02, Shift Routines and Operating Practices, requires which ONE (1) of the following?
- A. Either the Unit SCO or the Shift Superintendent shall conduct a walkdown of the RTGB with ONE or BOTH of the Control Operators and also conduct a walkdown of the backpanel area at least TWICE per shift.
  - B. Either the Unit SCO or the Shift Superintendent shall conduct a walkdown of the RTGB with ONE or BOTH of the Control Operators and also conduct a walkdown of the backpanel area at least ONCE per shift.
  - C. Both the Unit SCO and the Shift Superintendent shall conduct a walkdown of the RTGB with ONE or BOTH of the Control Operators and also conduct a walkdown of the backpanel area at least once per 12 hours.
  - D. Both the Unit SCO and the Shift Superintendent shall conduct a walkdown of the RTGB with BOTH of the Control Operators and also conduct a walkdown of the backpanel area at least once per day.
96. A Temporary Procedure Change is processed per AP-004. This Temporary Change receives interim approval on 10/24/01.
- Which ONE (1) of the following is the last date the Temporary Procedure Change may be used without receiving final approval?
- A. 11/01/01.
  - B. 11/07/01.
  - C. 11/24/01.
  - D. 10/24/02.

97. In accordance with OPS-NGGC-1301, which ONE (1) of the following is an acceptable practice for tagging a motor operated valve that is being used as a clearance boundary isolation point?
- A. The valve should be manually engaged to check valve position.
  - ✓B. The valve's position may be determined using concurrent verification before isolating the power supply.
  - C. The valve should be manually torqued closed if equipped with a ball screw actuator.
  - D. The valve's handwheel is not required to be tagged provided the valve is remotely positioned and the power supply is isolated.
98. Following the announcement of a fire in the South RHR room, the Shift Superintendent has announced "In the Control Room Shift Brief". Which ONE (1) of the following should NOT be communicated during the brief?
- A. EAL classifications.
  - B. Status of evacuations.
  - C. Status of fire.
  - ✓D. Orders to the fire brigade.
99. EOP-01-StCP - Steam Cooling is employed to provide the time that adequate core cooling is assured when no RPV injection source is available and water level cannot be maintained above Low Level 4. In these conditions, which ONE (1) of the following is the EOP basis for defining adequate core cooling?
- ✓A. Peak clad temperature below 1800°F
  - B. Fuel center line temperature below 1800°F
  - C. Peak clad temperature below 2200°F
  - D. Fuel center line temperature below 2200°F

100. Which ONE (1) of the following is NOT considered to be Post Accident Monitoring (PAM) Instrumentation in accordance with Technical Specifications?

- ✓A. Drywell water level.
- B. Drywell temperature.
- C. Suppression chamber water level.
- D. Suppression chamber water temperature.

Brunswick 2001 NRC Exam Answer Sheet RO

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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