

Final Submittal  
(Blue Paper)

*Brunswick 2007-301*

FINAL RO  
WRITTEN EXAMINATION  
~~AND REFERENCES~~  
*AND ANSWER KEY*

# Pearson NCS Test Sheet 100/W



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**SCORING & PRINTING OPTIONS:**

RESCORE     MULTIPLE ANSWER SCORING  
 CORRECT ANSWER     MARK X     TOTAL ONLY

MARK ONLY ONE

**KEY ID**  
A B C D

FEED IN THIS DIRECTION

**T F**

1 A B C  E

2 A  C D E

3 A  C D E

4 A B  D E

5 A B  D E

6 A B  D E

7 A  C D E

8  B C D E

9 A  C D E

10 A  C D E

11 A B  D E

12 A B  D E

13 A B C  E

14  B C D E

15 A B  D E

16 A B  D E

17 A B  D E

18 A  C D E

19  B C D E

20 A B C  E

21 A  C D E

22 A B C  E

23 A B C  E

24 A B  D E

25 A B  D E

**T F**

26  B C D E

27 A B C  E

28 A  C D E

29  B C D E

30 A  C D E

31 A B  D E

32 A B C  E

33 A  C D E

34 A B  D E

35  B C D E

36 A B C  E

37 A  C D E

38 A B C  E

39 A B  D E

40 A B  D E

41 A  C D E

42 A B  D E

43 A  C D E

44  B C D E

45  B C D E

46 A B  D E

47  B C D E

48 A  C D E

49 A  C D E

50 A B  D E

**T F**

51  B C D E

52 A B  D E

53 A B C  E

54 A B C  E

55 A B C  E

56 A B  D E

57 A B C  E

58  B C D E

59 A B C  E

60  B C D E

61 A B  D E

62 A B C  E

63 A B  D E

64 A B C  E

65 A B C  E

66  B C D E

67 A B  D E

68 A B  D E

69  B C D E

70  B C D E

71 A  C D E

72  B C D E

73  B C D E

74 A  C D E

75 A B  D E

**T F**

76 A B  D E

77 A B C  E

78  B C D E

79 A  C D E

80 A B  D E

81 A B  D E

82 A B  D E

83  B C D E

84 A B  D E

85 A  C D E

86 A  C D E

87 A  C D E

88 A B C  E

89 A B  D E

90 A  C D E

91 A B C  E

92 A  C D E

93 A  C D E

94 A B C  E

95 A B  D E

96 A B  D E

97  B C D E

98 A B C  E

99  B C D E

100 A B  D E

ANSWER KEY INFO.			
# OF KEYS			
ITEM COUNT			
1	1	1	2
1	1	1	3
2	2	4	
3	2		
4	4		
5	5		
6	5		
7	7		
8	8		
9	9		

PERFORMANCE ASSESSMENT				
E D U C A T I O N A L P E R F O R M A N C E	% OF TOTAL SCORE			POINTS EARNED
	100 = 100%			
1	1	1	1	1
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

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RO/SRO  
answer  
Key

FEED IN THIS DIRECTION

NUMBER CORRECT	
PERCENT CORRECT	
ROSTER NUMBER	
SCORE	
RESCORE	



COMBINED POINTS EARNED	
COMBINED PERCENT CORRECT	
LETTER GRADE	
SCORE	
RESCORE	



STUDENT ID NUMBER									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

**MARKING INSTRUCTIONS**

Use a No. 2 Pencil

A  C D E

Fill oval completely

A B C D E

Erase cleanly

NAME \_\_\_\_\_

SUBJECT \_\_\_\_\_

PERIOD \_\_\_\_\_ DATE \_\_\_\_\_

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

1. Unit Two (2) is in Mode 1.

No. 4 Diesel Generator Monthly Load Test is in progress with DG # 4 loaded to 3000 KW.

A seismic event occurs causing a complete Loss of Off-site Power and a LOCA on Unit Two (2) with the following times (in seconds):

- Time 0 = Seismic event and Loss of Off-site Power
- Time 5 = LOCA signal on Low Reactor water level

Which **ONE** of the following describes the RHR pump start sequence?

- 
- A. All four RHR pumps start at Time=15 seconds
  - B. All four RHR pumps start at Time=20 seconds
  - C. 'A', 'C', and 'D' RHR pumps start at Time=15 seconds  
'B' RHR pump starts at Time=20 seconds.
  - D. 'B' RHR pump starts at Time=15 seconds  
'A', 'C', and 'D' RHR pumps start at Time=20 seconds.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

2. Which **ONE** of the following is affected if power is lost to Panel 1-XDA?
- A. Normal power supply to RHR Valve 1-E11-F008
  - B. ASSD power supply to RHR Valve 1-E11-F008
  - C. Normal power supply to RHR Valve 1-E11-F009
  - D. ASSD power supply to RHR Valve 1-E11-F009
-

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3. IAW procedure 1(2)OP-17, which **ONE** of the following describe how RHR Minimum Flow Bypass Valves E11-F007A(B) operate to protect the RHR pumps?
- A. Immediately auto opens if loop flow is less than 2230 gpm and one associated RHR pump is running.  
Auto closes if system flow >2300 gpm after a 10 second time delay.
  - B. Auto opens if loop flow is less than 2230 gpm and one associated RHR pump is running after a 10 second time delay.  
Immediately auto closes if system flow >2300 gpm.
  - C. Immediately auto opens if loop flow is less than 2300 gpm and one associated RHR pump is running.  
Immediately auto closes if system flow >2300 gpm.
  - D. Auto opens if loop flow is less than 2300 gpm and one associated RHR pump is running after a 10 second time delay.  
Auto closes if system flow >2300 gpm after a 10 second time delay.

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4. Initial Conditions on Unit One (1) were:

- Due to a small line break vessel Level lowered to the LL-2 setpoint
- HPCI Discharge Pressure Transmitter, 1E41-PT-N009 failed downscale prior to HPCI injection flow.

Current Condition:

- The line break has been isolated.
- Vessel Level has been restored to 190 inches.
- HPCI Automatic Initiation signal has been reset
- HPCI flow has been reduced to 1000 gpm
- The SRO has directed you to remove HPCI from service.

For these conditions which **ONE** of the following describes the operation of the HPCI minimum flow valve, 1E41-F012 as HPCI is being removed from service?

- A. 1E41-F012 will remain closed as long as HPCI flow is greater than 400 gpm.
- B. 1E41-F012 will open when HPCI flow is less than 800 gpm.
- C. 1E41-F012 will remain closed regardless of HPCI flow.
- D. 1E41-F012 will remain open regardless of HPCI flow.

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5. Which **ONE** of the following Electrical Distribution systems, if lost, would leave RCIC capable of automatic initiation on low RPV water level, but incapable of automatic shutdown on high RPV water level?
- A. MCC – 1(2)XDA.
  - B. MCC – 1(2)XB.
  - C. DC distribution panel 3A (4A).
  - D. DC distribution panel 3B (4B).
-

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6. A feedwater line rupture has occurred on Unit Two (2) and the following conditions exist:

Drywell pressure	8.8 psig
Reactor water level	- 35 inches
RPV pressure	500 psig

Which **ONE** of the following describes the configuration of both loops of Core Spray?

- A. No Core Spray pumps are running.  
Both min flow valves 2E21-F031A(B) are open.  
Both inboard injection valves 2E21-F005A(B) are closed.  
Both outboard injection valves 2E21-F004A(B) are open.
- B. Both Core Spray pumps are running with flow to the vessel.  
Both min flow valves 2E21-F031A(B) are closed.  
Both inboard injection valves 2E21-F005A(B) are open.  
Both outboard injection valves 2E21-F004A(B) are closed.
- C. Both Core Spray pumps are running.  
Both min flow valves 2E21-F031A(B) are open.  
Both inboard injection valves 2E21-F005A(B) are closed.  
Both outboard injection valves 2E21-F004A(B) are open.
- D. Both Core Spray pumps are running with flow to the vessel.  
Both min flow valves 2E21-F031A(B) are open.  
Both inboard injection valves 2E21-F005A(B) are open.  
Both outboard injection valves 2E21-F004A(B) are open.



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7. Following a Recirc Pump trip at 60% power, one of the annunciators received in the control room is:

A-06 4-5 RECIRC A ONLY OUT OF SERVICE

Which **ONE** of the following effects on total core flow indication in the control room will be experienced as a result of the condition causing the annunciator A-06, 4-5?

- A. Indicated total core flow is NOT correct because reverse flow on the 'A' Loop is NOT being accounted for in determining total core flow.
- B. Indicated total core flow is correct because the non-operating loop flow is being subtracted from the operating loop flow to determine total core flow.
- C. Indicated total core flow is NOT correct because of a total core flow circuit malfunction.
- D. Indicated total core flow is correct because the total core flow circuit automatically adds each individual loop flow to determine total core flow.

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8. During an ATWS on Unit One (1), the SLC control switch is placed in the Pump B Run position with MCC 1XG de-energized. SLC indications are:

- Pump A red light                      OUT
- Pump B red light                      LIT
- Squib valve A light                  OUT
- Squib valve B light                  LIT
- SLC tank level                        53%
- SLC discharge pressure            1450 psig
- RWCU Inboard Isolation Valve, G31-F001    OPEN
- RWCU Outboard Isolation Valve, G31-F004    CLOSED

What operator action is required to inject Boron?

- 
- A. Perform alternate boron injection.
  - B. Monitor for lowering SLC tank level.
  - C. Close the inboard RWCU isolation valve.
  - D. Place the SLC control switch in Pump A Run.

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9. Following a refueling outage Unit Two (2) is conducting a plant startup. The reactor mode switch has just been placed to RUN with reactor power at 10%. All MSIVs are open, however the limit switch, B21-F022D-LS-3, on MSIV 2B21-F022D is currently seen as CLOSED by RPS.

Which valve closure would cause only a ½ scram on "B" RPS?

- A. 2B21-F022A.
- B. 2B21-F022B.
- C. 2B21-F022C.
- D. 2B21-F028D.

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10. Unit Two (2) has inserted a manual reactor scram due to a loss of RBCCW. Several control rods failed to insert on the scram. Plant conditions:

APRM indicated power	3%
Reactor pressure	960 psig, controlled by EHC
Drywell pressure	2.1 psig
Mode Switch	Shutdown
SDV Hi Hi Wtr Trip Bypass	Normal

Which **ONE** of the following describes the plant conditions required to reset RPS IAW LEP-02?

- A. Install jumpers IAW LEP-02, Reset ARI, verify the SDV Vent and Drain Valves are OPEN then reset RPS.
- B. Install jumpers IAW LEP-02, Inhibit ARI, verify the SDV Vent and Drain Valves are CLOSED then reset RPS.
- C. Install jumpers IAW SEP-10, Reset ARI, verify the SDV Vent and Drain Valves are OPEN then reset RPS.
- D. Install jumpers IAW SEP-10 inhibit ARI, verify the SDV Vent and Drain Valves are CLOSED then reset RPS.

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REACTOR OPERATOR NRC EXAM**

11. Unit Two (2) is in Mode 2 when IRM "F" mode switch is inadvertently placed in the "standby" position.

Which **ONE** of the following describes the affect this will have on the trip system?

- A. ½ scram on A RPS.
  - B. No scram signal on either A or B RPS.  
All IRM F trip functions are operable.
  - C. ½ scram on B RPS.
- 
- D. No scram signal on A or B RPS.  
None of the IRM F trip functions are operable.

**BRUNSWICK NUCLEAR PLANT  
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12. Unit 2 is in Startup with control rods being withdrawn for the purpose of bringing the reactor critical. SRM "A" has been partially withdrawn from the core.

If SRM "A" loses the Retract Permissive then which **ONE** of the following describes SRM "A" detector operation?

- A. Withdrawal of the SRM "A" will be prevented if any channel A IRM is above Range 3.
- B. This will result in a Control Rod Block if any channel A IRM is above Range 3.
- C. This will result in a Control Rod Block if any channel A IRM is below Range 3.
- D. Withdrawal of the SRM "A" will be prevented if any channel A IRM is below Range 3.

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13. In accordance with OGP-03, "Unit Startup and Synchronization" and Technical Specifications which **ONE** of the following describes the procedural guidance for confirming APRM overlap?
- A. All four (4) APRM's are required to be operable, have a GAF of  $\leq 1$  and indicate between 6% and 10% on the APRM/RBM recorders.
  - B. Three (3) APRM's are required to be operable, have a GAF of  $\leq 1$  and indicate between 6% and 10% on the APRM/RBM recorders.
  - C. All four (4) APRM's are required to be operable, have a GAF of  $\leq 1$  and indicate between 3.4% and 10% on the APRM/RBM recorders.
  - D. Three (3) APRM's are required to be operable, have a GAF of  $\leq 1$  and indicate between 3.4% and 10% on the APRM/RBM recorders.

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REACTOR OPERATOR NRC EXAM**

14. Unit Two (2) is in Startup. Reactor Steam Dome pressure is 160 psig and the SRO declares RCIC inoperable.

What actions, if any, are required by Technical Specifications?

- A. Only HPCI must be verified operable by administrative means immediately.
- B. Only HPCI must be verified operable by administrative means within 1 hour (not immediately).
- C. HPCI AND ADS must be verified operable by administrative means immediately.
- D. No actions are required.



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15. Unit Two (2) is in Mode 1 when a LOCA occurs resulting in the following plant conditions:

- |                               |   |
|-------------------------------|---|
| - Reactor water level         | 44 inches and decreasing                |
| - Emergency diesel generators | operating unloaded                      |
| - 2A and 2C RHR pumps         | tripped on overcurrent                  |
| - 2B and 2D RHR pumps         | failed to auto initiate                 |
| - 2A Core Spray pump          | operating in the minimum flow condition |
| - 2B Core Spray pump          | tripped on overcurrent                  |
| - ADS Inhibit Switches        | in AUTO                                 |

Alarm status is:

- |   |          |
|---|----------|
| - CORE SPRAY OR RHR PUMPS RUNNING (A-03 2-1)  | in alarm |
| - REACTOR ADS LO WATER LEVEL (A-03 4-2)       | in alarm |
| - REACTOR LOW WTR LEVEL INITIATION (A-03 6-9) | in alarm |
| - AUTO DEPRESS TIMERS INITIATED (A-03 5-1)    | clear    |
| - AUTO DEPRESS RELAYS ENERGIZED (A-03 3-2)    | clear    |

Which **ONE** of the following describes the status of the Automatic Depressurization System (ADS)?

ADS will:

- A. Actuate automatically in approximately 83 seconds.
- B. Actuate automatically after reactor level decreases to -45 inches.
- C. NOT automatically actuate and the SRVs must be manually opened.
- D. NOT automatically actuate until additional ECCS pumps are started.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

16. Unit One (1) is operating at 100% power when the control room receives the following alarms.

*SAFETY/RELIEF VALVE OPEN (A-03 1-10)*

*SAFETY OR DEPRESS VLV LEAKING (A-03 1-1)*

Additionally, the operators note a steam flow/feed flow mismatch with feed flow greater than steam flow and a decrease in generator power.

The operators identify an SRV with an OPEN indication and immediately cycle the control switch for the affected SRV several times.

Suppression Pool temperature is 100° F and trending up.

---

Which **ONE** of the following actions is required IAW 0AOP-30.0 "Safety/Relief Valve Failures", if the SRV fails to close?

- A. Pull the fuses identified on Attachment 1 of 0AOP-30.0, monitor tailpipe temperature and if valve still indicates open, then shutdown the reactor IAW GP-05.
- B. When suppression pool temperature reaches 110°F, pull the fuses identified in Attachment 1 of 0AOP-30.0.
- C. When suppression pool temperature reaches 110°F, manually scram the reactor.
- D. Immediately scram the reactor.

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REACTOR OPERATOR NRC EXAM**

17. RPS MG Set A has tripped. RPS Distribution Panel A has NOT yet been transferred to its alternate source.

The LL3 instrument providing input to PCIS Channel B2 fails downscale.

Which of the following describes the response of the Steam Line Drains?

- A. Only the B21- F016, Inboard Steam Line Drain, closes.
- B. Only the B21-F019, Outboard Steam Line Drain, closes.
- C. Both, the B21-F016, Inboard Steam Line Drain and B21-F019, Outboard Steam Line Drain, close.
- D. Neither, the B21-F016, Inboard Steam Line Drain, nor the B21-F019, Outboard Steam Line Drain, closes.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

18. When steam is discharged from the safety relief valves (SRV) to the suppression pool, which **ONE** of the following describes the flow path taken by the SRV discharge?
- A. The SRV discharges to a tailpipe which terminates in a manifold (T-Quencher) approximately seven feet above the bottom of the suppression pool.
  - B. The SRV discharges to a tailpipe which terminates in a manifold (T-Quencher) approximately seven feet below normal suppression pool water level.
  - 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.
  - 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.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

19. You are preparing to place Feedwater control in 3-Element Control. Feedwater Flow and Steam Flow are matched, both feed flow outputs are valid and the Master Control Station is in Automatic

Which **ONE** of the following describes additional permissives required to place Feedwater Control in 3-Element?

- A. All 4 steam flows real alarm block outputs are valid (within 10% of avg)  
At least 1 Feed pump control station is in Automatic  
Reactor Power is  $> 20\%$  as sensed by Total Feed Flow
- B. At least 2 of 4 steam flows real alarm block outputs are valid (within 10% of avg)  
At least 2 Feed pump control stations are in Automatic  
Reactor Power is  $> 20\%$  as sensed by Total Feed Flow
- C. All 4 steam flows real alarm block outputs are valid (within 10% of avg)  
At least 1 Feed pump control station is in Automatic  
Reactor Power is  $> 15\%$  as sensed by Total Feed Flow
- D. At least 2 of 4 steam flows real alarm block outputs are valid (within 10% of avg)  
At least 2 Feed pump control stations are in Automatic  
Reactor Power is  $> 15\%$  as sensed by Total Feed Flow

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

20. Unit Two (2) is operating at 23% rated thermal power with the following plant conditions:

Drywell pressure is 0.6 psig  
Drywell venting in progress via SBGT per 2-OP-10.  
CAC-V23, CAC-V9 and the Primary Containment Suction valve,  
F-BFV-RB are open.

During this evolution the Reactor Building Vent Exhaust Radiation monitors, D12-N010A and N010B, reach their trip setpoint.

How would Unit Two (2) drywell venting be affected?

- 
- A. Drywell venting would continue with SBGT taking suction on the Drywell only.
  - B. Drywell venting would continue with SBGT taking suction on the Drywell and the Reactor Building.
  - C. Drywell venting would stop due to a SBGT fan trip when CAC-V9, V23, and Primary Containment Suction Valve, F-BFV-RB close.
  - D. Drywell venting would stop due to drywell vent valves CAC-V9, V23 and Primary Containment Suction Valve, F-BFV-RB closing.

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21. Which **ONE** of the following identifies the loads and the associated signals for the Full Time Load Shed scheme (LOCA Load Shed and Unit Trip Load Shed) on Unit Two (2) during normal full power operation?
- A. 1 Turbine Building Chiller (on LOCA Signal)  
1 Running Circ Water Intake Pump (on LOCA Signal)  
2 Heater Drain Pumps (on LOCA Signal)
  - B. 1 Turbine Building Chiller (on LOCA Signal)  
1 Running Circ Water Intake Pump (on LOCA Signal)  
2 Heater Drain Pumps (on Generator Lockout Signal)
  - C. 2 Turbine Building Chillers (on LOCA Signal)  
1 Running Circ Water Intake Pump (on LOCA Signal)  
2 Heater Drain Pumps (on Generator Lockout Signal)
  - D. 1 Turbine Building Chiller (on Generator Lockout Signal)  
2 Running Circ Water Intake Pumps (on LOCA Signal)  
2 Heater Drain Pumps (on Generator Lockout Signal)

**BRUNSWICK NUCLEAR PLANT  
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22. With the vital UPS in a normal alignment, which **ONE** of the following describes how UPS functions to maintain its power supply?
- A. If the inverter output is lost, then the UPS will transfer to its 125 VDC power supply.
  - B. If the rectifier output is lost, then the UPS will transfer to its 125 VDC power supply.
  - C. If the inverter output is lost, then the UPS will transfer to its 250 VDC power supply.
  - D. If the rectifier output is lost, then the UPS will transfer to its 250 VDC power supply.



**BRUNSWICK NUCLEAR PLANT  
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23. Unit One (1) is operating at rated power when DC Switchboard 1B is lost.

What immediate impact will this power loss have on the MSIVs and SRVs?

- A. Inboard MSIVs close, SRVs are available to control RPV pressure using their normal power source.
- B. Outboard MSIVs close, SRVs are available to control RPV pressure using their normal power source.
- C. Inboard MSIVs close, SRVs are available to control RPV pressure using their alternate power source.
- D. Outboard MSIVs close, SRVs are available to control RPV pressure using their alternate power source.

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24. During accident conditions, the following sequence of events occurs:

T = 0 seconds	Drywell pressure rises above the scram setpoint
T = 4 seconds	Off-site power is lost
T = 5 seconds	Reactor pressure is 410 psig
T = 14 seconds	Diesel Generators energize their respective E Buses
T = 16 seconds	Reactor level drops below LL3

Which **ONE** of the following states the time that the Core Spray pumps auto start?

- A. T = 0 seconds
- B. T = 20 seconds
- C. T = 29 seconds.
- D. T = 31 seconds.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

25. Unit One (1) is in Startup with a Reactor Feed Pump in service and level control being maintained through the Startup Level Control Valve (SULCV).

Which **ONE** of the following describes the response of the SULCV, FW-LV-3269, and the RFP recirculation valves (FW-FV-V46 and FW-FV-V47) to a loss of air?

- A. The RFP Recirc valves (FW-FV-V46 and FW-FV-V47) fail open and the SULCV, FW-LV-3269, fails open.
- B. The RFP Recirc valves (FW-FV-V46 and FW-FV-V47) fail closed and the SULCV, FW-LV-3269, fails closed.
- C. The RFP Recirc valves (FW-FV-V46 and FW-FV-V47) fail open and the SULCV, FW-LV-3269, fails closed.
- D. The RFP Recirc valves (FW-FV-V46 and FW-FV-V47) fail closed and the SULCV, FW-LV-3269, fails open.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

26. Unit One (1) was operating at power when a line break in the drywell occurred simultaneously with a Loss of the SAT. The following indications now exist:

Reactor water level	+110 inches
Reactor pressure	120 psig
Drywell pressure	13 psig
DG1	Running loaded
DG2	Tripped/Unavailable

How is the RBCCW system affected?

- A. No RBCCW pumps are running and DW Header Equipment Isolation valves RCC-V28 and RCC-V52 remain open.
- B. RBCCW pump B only is running and DW Header Equipment Isolation valves RCC-V28 and RCC-V52 remain open.
- C. No RBCCW pumps are running and DW Header Equipment Isolation valves RCC-V28 and RCC-V52 auto closed.
- D. RBCCW pump A and C only are running and DW Header Equipment Isolation valves RCC-V28 and RCC-V52 auto closed.

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REACTOR OPERATOR NRC EXAM**

27. During the approach to criticality, the operator is withdrawing rods using single notch withdrawal.

The operator initiates a notch withdrawal of control rod 18-19 from 02 to 04 and notes faster than normal rod speed.

Which **ONE** of the following actions could be used to prevent the control rod from double notching?

- A. Place Rod Select Power to Off.
- B. Place the Timer Test Switch to the Reset position.
- C. Place the Rod Movement Control Switch to Insert.
- D. Place the Emergency Rod In Notch Override Switch to Emergency In.

**BRUNSWICK NUCLEAR PLANT  
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28. Unit One (1) is in Startup with reactor pressure at 980 psig. Control Rod individual scram time testing is being performed per PT-14.2.1.

As the control rod 10-11 is scrambling inward, the ball check valve fails to re-position.

This failure will result in which **ONE** of the following?

- A. Control Rod 10-11 is prevented from fully inserting.
- B. Control Rod 10-11 scram time is slower than normal.
- C. Control Rod 10-11 scram time at high reactor pressures is unaffected.
- D. Multiple HCU accumulator alarms will be received.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

29. Which **ONE** of the following describes the power supply and systems affected by the loss of UPS 120V panel V-10A?
- A. The primary power supply to Unit 2 RPIS and RWM
  - B. The primary power supply to Unit 2 RPIS and RMCS
  - C. The alternate power supply to Unit 1 RPIS and RWM
  - D. The alternate power supply to Unit 1 RPIS and RMCS
-

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

30. A valid LPCI initiation has occurred and cannot be reset at this time. The division 1 LPCI pressure switch input to the Recirculation System Logic has failed high. Actual Reactor Pressure is 300 psig and lowering.

How has the Recirculation system been affected?

- A. ONLY Recirculation Pump Discharge Valve, B32-F031B and Recirculation Pump Discharge Bypass Valve, B32-F032B have auto closed.
- B. Recirculation Pump Discharge Valves, B32-F031A and B, and Recirculation Pump Discharge Bypass Valves, B32-F032A and B have auto closed.
- C. ONLY Recirculation Pump Discharge Valve, B32-F031A and Recirculation Pump Discharge Bypass Valve, B32-F032A have auto closed.
- D. Recirculation Pump Discharge Valves, B32-F031A and B and Recirculation Pump Discharge Bypass Valves, B32-F032A and B remain open.



**BRUNSWICK NUCLEAR PLANT  
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31. Unit One (1) was operating with the following conditions:

Reactor Power	55%
RFP 1A	operating
RFP 1B	idling
Recirc Pump Speeds	58%

RFP 1A trips. Reactor Level drops to the scram setpoint and continues to lower to +110 inches before the operator brings the idling RFP on line (30 seconds after the trip of RFP 1A) to restore Reactor Level.

Assuming all other equipment operated properly and all operator scram actions performed correctly, what will be the final status of the Reactor Recirculation pumps after the scram?

- A. Running at 58% speed.
- B. Running on limiter #2.
- C. Running on limiter #1.
- D. Tripped.

**BRUNSWICK NUCLEAR PLANT  
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32. Initial conditions:

- Unit Two (2) is in Startup
- RWCU is being used for reactor vessel water level control.
- Reject flow to Radwaste is being controlled at 90 gpm.
- Reactor vessel water temperature is 180° F.

The following annunciator is received:

- CLEANUP DISCH PRESS HI/LO (A-04 2-4)

Which **ONE** of the following describes the expected response of the RWCU system?

- 
- A. Reject to Radwaste, G31-F035, auto closes due to a low pressure downstream of the flow control valve.
  - B. Reject to Radwaste, G31-F035, auto closes due to a high pressure downstream of the flow control valve.
  - C. Reject Flow Control Valve, G31-F033, auto closes due to a low pressure downstream of the flow control valve.
  - D. Reject Flow Control Valve, G31-F033, auto closes due to a high pressure downstream of the flow control valve.

**BRUNSWICK NUCLEAR PLANT  
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33. Unit Two (2) is in Mode 1 performing a plant startup with the following conditions:

- 2 bypass valves are open
- Max combined flow dial is adjusted to 110%
- Load limit dial is adjusted to 100%
- Medium speed acceleration rate selected
- 1800 speed select depressed
- Turbine speed is 900 rpm.
- Speed Increasing light illuminated
- Pressure Regulator A is in control
- Pressure Regulator B is in standby (3 psig bias)
- Pressure Set 945 psig

---

Which **ONE** of the following describes how the control valves and bypass valves will respond if the "pressure setpoint decrease pushbutton" is held in the depressed position?

- A. The Control Valves remain throttled to regulate turbine speed increase  
The Bypass Valves will close as necessary to maintain reactor pressure at ~942 psig.
- B. The Control Valves remain throttled to regulate turbine speed increase  
The Bypass Valves will open further as necessary to control reactor pressure at the lowering pressure demand.
- C. The Control Valves open as limited by the speed limiter  
The Bypass Valves will close slightly and maintain reactor pressure approximately 3 psi higher.
- D. The Control Valves will throttle to control reactor pressure at the lowering pressure demand.  
The Bypass valves close in response to lowering pressure demand.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

34. Unit Two (2) is at 100% power.

PUMP B SEAL STAGING FLOW HI/LO annunciator is received.

No other annunciators are in the alarm condition.

Recirc Pump 2B seal #2 pressure lowers towards zero.

Recirc Pump 2B seal #1 pressure remains stable at 1000 psig.

Given these conditions, which **ONE** of the following is indicated?

A. Failure of seal #1.

B. Failure of seal #2.

C. Plugging of internal restricting coil #1.

D. Plugging of internal restricting coil #2.

**BRUNSWICK NUCLEAR PLANT  
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35. Which **ONE** of the following describes how the Reactor Building and Drywell Floor Drain and Equipment Drain sump integrators monitor leakage?
- A. The first timer starts when the pump starts. If the timer times out before the pump stops, the high leakage annunciator alarms. When the pump stops, the first timer is reset and the second timer starts. All timers can be reset by placing the respective pump control handle momentarily in the stop position and may also be reset from the main control room back panels.
  - B. Both timers start when the pump starts. If either timer times out before the pump stops, the high leakage annunciator alarms. All timers can be reset by placing the respective pump control handle momentarily in the stop position and may also be reset from the main control room back panels.
  - C. The first timer starts when the pump starts. If the timer times out before the pump stops, the high leakage annunciator alarms. When the pump stops, the first timer is reset and the second timer starts. The timers can be reset **ONLY** from the main control room back panels.
  - D. Both timers start when the pump starts. If either timer times out before the pump stops, the high leakage annunciator alarms. The timers can be reset **ONLY** from the main control room back panels.

**BRUNSWICK NUCLEAR PLANT  
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36. During Station Blackout conditions, the Diesel Driven Fire Pump is providing inventory makeup to the Unit Two (2) reactor vessel due to the failure of RCIC and HPCI.

Fire Water Storage Tank level is rapidly lowering due to a breach of tank integrity.

Which **ONE** of the following sources should the Diesel Driven Fire Pump suction be aligned to IAW OP-41?

- A. County Water Storage Tank.
- B. Unit One (1) Condensate Storage Tank.
- C. Unit Two (2) Condensate Storage Tank.
- D. Makeup Demineralized Water Tank.

**BRUNSWICK NUCLEAR PLANT  
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37. A valid Reactor Water Low Level 2 signal has occurred on Unit One (1).

Both SBTG fans have started and Reactor Building Ventilation fans have stopped.

Which **ONE** of the following describes other automatic actions that occur to maintain Secondary Containment differential pressure?

- A. The Purge Suction valve, 1I-BFV-RB, and Purge Inboard Exhaust Isolation valve, 1N-BFV-RB, close and the purge fans stop. If closed the SBTG suction valves, 1-VA-1C-BFV-RB & 1-VA-1G-BFV-RB, and discharge valves, 1-VA-1B-BFV-RB & 1-VA-1E-BFV-RB open.
- B. The Purge Suction valve, 1I-BFV-RB, and Purge Inboard Exhaust Isolation valve, 1N-BFV-RB, close and the purge fans stop. The SBTG Reactor Building Suction valves, 2H-BFV-RB and 2D-BFV-RB, open.
- C. The SBTG Primary Containment Suction valve, 2F-BFV-RB, opens. The SBTG Reactor Building Suction valves, 2H-BFV-RB and 2D-BFV-RB, open.
- D. The SBTG Reactor Building Suction valves, 2H-BFV-RB and 2D-BFV-RB, close. If closed the SBTG suction valves, 1-VA-1C-BFV-RB & 1-VA-1G-BFV-RB, and discharge valves, 1-VA-1B-BFV-RB & 1-VA-1E-BFV-RB open.

**BRUNSWICK NUCLEAR PLANT  
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38. Rod 46-39 was selected just prior to a reactor scram.

No operator action has been taken.

The RO observes that the "FULL-IN" light is illuminated for rod 46-39 on the Full Core Display while the Four Rod Display Selected Rod is not indicating "00".

Which **ONE** of the following describes the correct reason for this observation?

- A. The RPIS 24 VDC power supply has tripped.
- B. A reactor scram automatically deselects any selected rod.
- C. The RPIS Rod Drift circuitry bypasses the Four Rod Display.
- D. The scram must be reset to allow the rod to settle to position "00".



**BRUNSWICK NUCLEAR PLANT  
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39. Unit One (1) was initially at 56% power with the following indications

- Core Plate DP 4.5 psid
- Total Core Flow is 33.2 mlb/hr
- Reactor Recirculation Loop A indicated flow  $33 \times 10^3$  gpm
- Reactor Recirculation Loop B indicated flow  $33 \times 10^3$  gpm

An event has occurred and the indications now read:

- Core Plate DP 4.1 psid
- Total Core Flow 35.2 mlb/hr
- Reactor Recirculation Loop A indicated flow  $33 \times 10^3$  gpm
- Reactor Recirculation Loop B indicated flow  $35 \times 10^3$  gpm

---

Which **ONE** of the following describes the reason for the changes?

- A. Total Core Flow summing circuit failure
- B. B Recirc pump speed was raised
- C. Jet Pump #13 failure
- D. Jet Pump #6 failure

**BRUNSWICK NUCLEAR PLANT  
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40. A DBA LOCA occurs on Unit One (1) concurrent with a Loss of Offsite Power on both Units.

A 4160 VAC bus E3 lockout occurs due to protective relay actuation.

What is the response of the Unit One (1) Low Pressure ECCS systems?

- A. One loop of Core Spray and 2 RHR pumps in one loop will inject.
- B. One loop of Core Spray and 3 RHR pumps in two loops will inject.
- C. Both Loops of Core Spray and 2 RHR pumps in one loop will inject.
- D. Both Loops of Core Spray and 3 RHR pumps in two loops will inject.

**BRUNSWICK NUCLEAR PLANT  
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41. Which **ONE** of the following identifies the location and the method for transferring Distribution Panel 9A to its alternate source?
- A. Turbine building 4160 V BOP bus area; close the alternate supply first, then open the normal supply.
  - B. Turbine building 4160 V BOP bus area; open the normal supply first, then close the alternate supply.
  - C. Battery Room in Cable Spread; close alternate supply first, then open the normal supply.
  - D. Battery Room in Cable Spread; open normal supply first, then close the alternate supply.

**BRUNSWICK NUCLEAR PLANT  
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42. Unit One (1) is at 100% Power.

Which **ONE** of the following describes the fast closure coincident logic and the **MINIMUM NUMBER OF** closed Turbine Control Valves which would produce a full reactor scram?

- A. TCVs 1 and 3 or 2 and 4
- B. Any three TCVs
- C. TCVs 1 or 3 and 2 or 4.
- D. All 4 TCVs

**BRUNSWICK NUCLEAR PLANT  
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43. Following a loss of the Uninterruptible Power Supply system, a Reactor scram occurs. Indications on P603:

APRM/IRM Recorders	Blank
APRM Downscale	Lights illuminated
SRM Recorders	Blank
SRM Periods	Indicating -80 seconds
Full Core Display	Rod full-in/full-out indications unavailable

ERFIS and the Process Computer are not available.

What is the current status of the Reactor?

- 
- A. Reactor power cannot be determined to be below the APRM downscale setpoint.
  - B. Reactor power can be determined to be below the APRM downscale setpoint from the RTGB.
  - C. Reactor power can be determined to be below the APRM downscale setpoint only at the back panels.
  - D. Reactor can be determined to be shutdown under all conditions without boron.

**BRUNSWICK NUCLEAR PLANT  
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44. The main control room has been evacuated in accordance with 0AOP-32. Control has been transferred to the Remote Shutdown Panel (RSDP).

While operating in this condition, which **ONE** of the following can be performed per 0AOP-32 from the RSDP

- A. Operate RCIC.
- B. Operate HPCI.
- C. Reject suppression pool water to radwaste.
- D. Place RHR Loop A in Suppression Pool Cooling.

**BRUNSWICK NUCLEAR PLANT  
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45. How will the RBCCW system flow be affected if the RBCCW temperature control valve sensor fails low?
- A. The TCV will open resulting in less system flow being directed through the RBCCW Heat Exchanger.
  - B. The TCV will close resulting in more system flow being directed through the RBCCW Heat Exchanger.
  - C. The TCV will close resulting in less system flow being directed through the RBCCW Heat Exchanger.
  - D. The TCV will open resulting in more system flow being directed through the RBCCW Heat Exchanger.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

46. During rated power operation on Unit One (1) the Division II RNA supply header develops a leak. The following is observed by the RO:

- RB INSTR AIR RECEIVER 1B PRESS LOW (UA-01 1-2)
- Instrument air pressure at the RTGB (IA-PI-724-1) is 115 psig
- Service air pressure at the RTGB (SA-PI-765-1) is 115 psig

Based on these plant conditions, which **ONE** of the following actions will occur?

- A. Service air valves PV-706-1 and PV-706-2 auto close.
- B. Interruptible instrument air valves PV-722-1 and PV-722-2 auto close.
- C. Div II Backup Nitrogen Rack Isolation Valve, RNA-SV-5481, auto opens.
- D. Service Air Dryer A Bypass Pressure Control Valve, SA-PV-5067, begins to auto open.



**BRUNSWICK NUCLEAR PLANT  
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47. Which **ONE** of the following is the preferred system for alternate shutdown cooling in accordance with AOP-15.0, including the reason?
- A. RHR due to the injection path through the jet pumps.
  - B. Core Spray due to the ability to take a suction from the CST.
  - C. Core Spray due to the injection path through the spray header.
  - D. RHR due to the ability to take a suction from the reactor vessel.
-

**BRUNSWICK NUCLEAR PLANT  
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48. Unit Two (2) is in a refueling outage with Primary Containment Ventilation During Personnel Entry in progress. A spent fuel bundle is dropped resulting in the following alarms being received:

Area Rad Refuel Floor High (UA-03 3-7)  
Process Rx Bldg Vent Rad Hi (UA-03 4-5)  
Process Rx Bldg Vent Rad Hi-Hi (UA-03 3-5)

The SRO enters AOP-05.0.

Which **ONE** of the following automatic actions, if any, occurs at this time?

- A. NO automatic actions occur.
- B. CAC vent and purge valves auto isolate  
Control Room Emergency Ventilation System does not auto start.
- C. CAC vent and purge valves do not auto isolate.  
Control Room Emergency Ventilation System auto starts
- D. CAC vent and purge valves auto isolate  
Control Room Emergency Ventilation System auto starts.

**BRUNSWICK NUCLEAR PLANT  
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49. Which **ONE** of the following Technical Specification requirements ensures that the peak drywell pressure following a design basis accident will not exceed the design pressure?
- A. Average drywell air temperature is maintained  $< 150^{\circ}\text{F}$ .
  - B. The reactor will be shut down when suppression pool temperature is  $> 110^{\circ}\text{F}$ .
  - C. The reactor building to suppression chamber vacuum breakers must be operable.
  - D. The suppression chamber-to-drywell vacuum breakers are all required to be closed.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

50. Following a Unit One (1) Reactor Scram with a Group 1 isolation the operating crew is performing actions IAW 1EOP-01-RVCP guidance. Plant conditions are:

Reactor water level    187 inches, steady

Reactor pressure        ~1130 psig, multiple SRV/ADS valves are opening on their relief valve setpoints

1EOP-01-RVCP requires that SRV/ADS valves be opened until reactor pressure decreases to a specific value.

Which **ONE** of the following describes the 1EOP-01-RVCP guidance for pressure control?

- 
- A. OPEN SRV/ADS valves until reactor pressure decreases to 950 psig. The RO must adhere to a specified SRV/ADS valve opening sequence.
  - B. OPEN SRV/ADS valves until reactor pressure decreases to 1050 psig. The RO must adhere to a specified SRV/ADS valve opening sequence.
  - C. OPEN SRV/ADS valves until reactor pressure decreases to 950 psig. The RO is not required to adhere to a specified SRV/ADS valve opening sequence.
  - D. OPEN SRV/ADS valves until reactor pressure decreases to 1050 psig. The RO is not required to adhere to a specified SRV/ADS valve opening sequence.

**BRUNSWICK NUCLEAR PLANT  
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51. Following a Group 1 isolation, control rods failed to insert on Unit Two (2). The crew is executing 2EOP-01-LPC and 0EOP-02-PCCP. Current plant conditions are:

Suppr pool temp	167°F
Suppr pool level	-29"
Reactor pressure	950 psig
Reactor level	TAF
Reactor power	7%
SRVs	One open

Which **ONE** of the following actions is required by Emergency Operating Procedures?

---

(reference provided)

- A. Perform emergency depressurization.
- B. Equalize around and open MSIVs to establish the main condenser as a heat sink.
- C. Open an additional SRV to reduce reactor pressure, 100°F/Hr cooldown rate may be exceeded.
- D. Open an additional SRV to reduce reactor pressure, 100°F/Hr cooldown rate may NOT be exceeded.

**BRUNSWICK NUCLEAR PLANT  
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52. Which **ONE** of the following is the reason for emergency depressurization when Drywell temperature cannot be restored and maintained below 300°F?
- A. Prevent chugging, (i.e., fatigue fracture of downcomer due to cyclic condensation of the steam at the downcomer openings)
  - B. Prevent exceeding the suppression chamber design temperature
  - C. Prevent exceeding the SRV maximum qualification temperature
  - D. Prevent exceeding the PCPL "A"

**BRUNSWICK NUCLEAR PLANT  
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53. Following a loss of drywell cooling a Unit Two (2) scram occurs due to high drywell pressure. A steam leak in the drywell subsequently results in the following plant conditions:

RPV level	+100"
RPV pressure	350 psig
Drywell pressure	9 psig
Drywell average temp	295°F
Supp chamber pressure	7.5 psig
Suppr pool level	-5.5 inches

Which **ONE** of the following actions is required in regard to drywell spray?

(reference provided)

---

- A. Spray the drywell to lower drywell pressure below 1.7 psig.
- B. Do NOT spray the drywell. Defeat drywell cooler LOCA lockout per SEP-10.
- C. Do NOT spray the drywell. Open 7 ADS valves for emergency depressurization.
- D. Spray the drywell to maintain drywell temperature less than 300°F.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

54. During accident conditions, suppression pool level cannot be maintained above -6.5 ft.

EOP-02-PCCP, Primary Containment Control Procedure, requires which **ONE** of the following actions?

- A. Terminate RCIC to prevent exceeding the Pressure Suppression Pressure Limit.
- B. Terminate HPCI to prevent exceeding the Pressure Suppression Pressure Limit.
- C. Terminate RCIC to prevent exceeding the Primary Containment Pressure Limit-A.
- D. Terminate HPCI to prevent exceeding the Primary Containment Pressure Limit-A .



**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

55. The Unit is in Shutdown Cooling but needs to be removed from service for a short period of time.

In accordance with OP-17, with no forced circulation and temperature approaching 125° F, what is the required minimum level band and what is the reason for this requirement?

- A. 180" to 200". The level band is established to maintain a natural circulation flowpath coupling within the core, but not with the downcomer region.
- B. 180" to 200". The level band is established to maintain a natural circulation flowpath coupling between the core and the downcomer region.
- C. 200" to 220". The level band is established to maintain a natural circulation flowpath coupling within the core, but not with the downcomer region.
- D. 200" to 220". The level band is established to maintain a natural circulation flowpath coupling between the core and the downcomer region.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

56. During an ATWS, EOP-01-LPC is being executed.

Plant conditions are:

Reactor power	3%
Suppr pool temp	115°F
Drywell pressure	1.7 psig
RPV water level	+85"
SRV # F013E	Failed open
RPV pressure	410 psig
SLC	Injecting

Which **ONE** of the following actions is required by LPC at this time?

- A. Maintain RPV water level between TAF and the present level.
- B. Open seven SRVs to emergency depressurize.
- C. Terminate and Prevent injection from any RHR and Core Spray pump.
- D. Maintain RPV water level between LL4 and the present level.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

57. An event has occurred on Unit Two (2) and the SRO has entered EOP-04-RRCP. The SRO has just told you to ensure Turbine building ventilation is in service in a recirculation lineup per step RR-16 of EOP-04-RRCP.

Which **ONE** of the following describes the reason for this step?

- A. It will assure that a radioactive release in the Turbine Building is contained in that building.
- B. It will assure a radioactive release from the Turbine Building is a monitored elevated release.
- C. It will assure a positive pressure is maintained in the Turbine Building to prevent a Secondary Containment leak from entering the turbine building.
- D. It will assure that a radioactive release from the Turbine Building is not an unmonitored ground release.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

58. A report of a fire in the Unit One (1) HPCI room has been received. The installed fire suppression system has initiated.

Which **ONE** of the following is the type of installed suppression system and describes the Operational implications from an actuation of this system?

- A. A CO<sub>2</sub> fire suppression system.  
Atmospheric monitoring required prior to entry following initiation.
- B. A CO<sub>2</sub> fire suppression system.  
HPCI room ventilation must be started before the CO<sub>2</sub> system can be reset.
- C. A wet pipe sprinkler system.  
Radwaste must be notified for sump pump draining.
- D. A wet pipe sprinkler system.  
HPCI inoperability due to damaged electrical components.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

59. Unit Two (2) was operating at rated power. Both Reactor Feed Pumps tripped. HPCI and RCIC both failed. CRD flow has been maximized and SLC is injecting demin water to stabilize RPV level. Current plant conditions:

RPV level	+30"
RPV pressure	950 psig
Drywell pressure	2.0 psig
Drywell temp	152° F
Torus pressure	1.5 psig

Which **ONE** of the following describes the action which is required to control containment parameters?

- A. Vent the drywell per OP-10.
- B. Vent the drywell per SEP-01.
- C. Spray the suppression pool per SEP-03.
- D. Defeat drywell cooler LOCA lockout per SEP-10 and restart the drywell coolers.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

60. During an ATWS, EOP-01-LPC directs the operator that a cooldown can NOT be initiated prior to the Cold Shutdown Boron Weight (CSBW) being injected into the reactor vessel.

Which **ONE** of the following is the reason for the above requirement, as stated in 00I-37.5 "LEVEL/POWER CONTROL PROCEDURE BASIS DOCUMENT"?

- A. In a partially borated core the reactivity effects of a cooldown are unpredictable with respect to performance of subsequent steps in EOP-01-LPC.
- B. The cooldown will reduce steaming rates resulting in stagnant core flow which may lead to neutron flux oscillations.
- C. Initiating a cooldown while injecting boron will prevent the boron from being uniformly mixed.
- D. Cooldown is not allowed at this time to ensure that low pressure injection systems cannot inject into the vessel and add positive reactivity.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

61. Following a Unit Two (2) Reactor scram, control rods have failed to fully insert. MSIVs have closed due to mis-operation of the Mode Switch.

EOP-01-LPC, Level Power Control, is being executed. Prior to reaching the step to equalize and open MSIVs, a step in LPC asks "Is Main Condenser Available As A Heat Sink?"

Which **ONE** of the following plant conditions means that the condenser is **NOT** available?

- A. Condenser vacuum is 0 inches.
- B. The Condensate Pumps are not available.
- C. All 4KV BOP busses are de-energized.
- D. Mechanical Vacuum Pumps cannot be operated.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

62. Unit Two (2) is in Startup with Reactor Pressure at 800# when the operating CRD Pump trips on low suction pressure. The operator attempts to start the standby CRD Pump, which fails to start.

Which **ONE** of the following actions is required IAW 0AOP-02?

- A. If a CRD pump cannot be returned to service within 20 minutes initiate a reactor scram.
- B. Scramming the reactor is **NOT** required until two or more HCU low pressure alarms are received.
- C. Scramming the reactor is **NOT** required unless a CRD pump has not been restored within 20 minutes and the first HCU alarm is received.
- D. Immediately scram the reactor if one HCU low pressure alarm is received.



**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

63. Which **ONE** of the following requires Emergency Depressurization?
- A. When reactor vessel level can **NOT** be restored and maintained greater than LL-4 and Suppression Pool Level is less than -8 ft.
  - B. When a primary system is discharging into the reactor building **AND** one area has exceeded max safe operating value.
  - C. When it has been determined that suppression pool water level is above +6 inches and cannot be maintained below +6 inches.
  - D. When Drywell average air temperature exceeds 300°F regardless of the status of Drywell Sprays and cooling.

**BRUNSWICK NUCLEAR PLANT  
REACTOR OPERATOR NRC EXAM**

64. Unit One (1) is in Refuel with Shutdown Cooling in service and core reload in progress. A spent fuel bundle has just been dropped in the spent fuel pool and fuel damage is suspected.

*AREA RAD REFUEL FLOOR HIGH (UA-03 3-7)* is in alarm.

Based on the above information the refuel floor has been evacuated.

What other areas are specifically required to be evacuated IAW AOP-05.0 "RADIOACTIVE SPILLS, HIGH RADIATION, AND AIRBORNE ACTIVITY"?

- A. The Drywell must be evacuated.  
Neither the ECCS pipe tunnel nor the Reactor Building -17 are required to be evacuated.
- B. The Drywell and ECCS pipe tunnel must be evacuated.  
The Reactor Building -17 is not required to be evacuated.
- C. The Drywell and Reactor Bldg -17' elevation must be evacuated.  
The ECCS pipe tunnel is not required to be evacuated.
- D. The Drywell, Reactor Bldg -17' elevation and ECCS pipe tunnel must be evacuated.

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65. IAW 00I-37.9, Secondary Containment Control Procedure (SCCP) Basis Document, which **ONE** of the following is the basis for entering OEOP-03-SCCP when a positive pressure condition exists in the reactor building?
- A. To direct actions to conduct off-site dose rates and surveys.
  - B. To direct actions to monitor and control radioactivity released from the Reactor Building roof vent.
  - C. To direct actions to operate Reactor Building HVAC after the release of the Secondary Containment blowout panels.
  - D. To direct actions to operate Reactor Building HVAC before the release of the Secondary Containment blowout panels.

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66. In Mode 3, OP-10 prohibits venting the drywell and the suppression pool chamber simultaneously because the action could result in which **ONE** of the following?
- A. Bypassing the pressure suppression function.
  - B. Operation of torus to drywell vacuum breaker.
  - C. Operation of reactor building to torus vacuum breakers.
  - D. Excessive release of radioactivity through the main stack.
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67. Units One (1) and Two (2) are both performing a startup following a forced shutdown for hurricane conditions.

Unit One (1) is at 25% power with Turbine roll in progress.

Unit Two (2) is at 800 psig performing Reactor heatup and pressurization.

What is the MINIMUM number of reactor operators (RO) required by OI-01.02 "Shift Routines and Operating Practices," AND Technical Specifications (TS) to be in the combined U1 and U2 main control rooms (as defined by OI-01.02)?

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- A. OI-01.02 – 2 ROs  
TS – 2 ROs
- B. OI-01.02 – 3 ROs  
TS – 3 ROs
- C. OI-01.02 – 4 ROs  
TS – 2 ROs
- D. OI-01.02 – 4 ROs  
TS – 3 ROs

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68. Unit Two (2) is operating at end of Cycle 17 with coast-down in progress. GP-13 has been implemented by bypassing feedwater flow around high pressure feedwater heaters.

Which **ONE** of the following describes the effects this has on Unit Two (2) operation?

- A. The changes in core inlet sub-cooling will make the core flux more top peaked.
- B. A trip of a single recirculation pump will increase the margins to thermal limits.
- C. A trip of a single recirculation pump will increase the possibility of a TH1 event.
- D. The decrease in core inlet subcooling will require adjustments to the core thermal limits.

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69. If no electrical faults are present and the associated pump suction valve is open,

Which **ONE** of the following is a difference between the Unit One (1) and Unit Two (2) condensate system?

- A. To manually start a condensate pump on Unit One (1) the Mode Switch must be in MANUAL AND discharge pressure < 130 psig.  
On Unit Two (2) the Mode Switch must be in AUTO OR discharge pressure < 110 psig.
- B. To manually start a condensate pump on Unit One (1) the Mode Switch must be in AUTO OR discharge pressure < 110 psig.  
On Unit Two (2) the Mode Switch must be in MANUAL AND discharge pressure < 130 psig.
- C. To manually start a condensate pump on Unit One (1) the Mode switch must be in MANUAL OR the discharge valve closed.  
On Unit Two (2) the Mode Switch must be in AUTO AND the discharge valve must be closed.
- D. To manually start a condensate pump on Unit One (1) the Mode Switch must be in AUTO OR the discharge valve must be closed.  
On Unit Two (2) the Mode switch must be in MANUAL AND the discharge valve closed.

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70. Due to an event on Unit Two (2), the emergency facilities have been activated and control room habitability may become a concern.

Unless otherwise directed by the Radiological Controls Director or Manager, which **ONE** of the following describes standard criteria for continuous habitability of the control room IAW OPEP-03.7.7?

- A. Dose Rate < 5 mRem/hr direct  
Airborne < 0.25 DAC
  - B. Dose Rate < 10 mRem/hr direct  
Airborne < 0.25 DAC
- 
- C. Dose Rate < 5 mRem/hr direct  
Airborne < 1 DAC
  - D. Dose Rate < 10 mRem/hr direct  
Airborne < 1 DAC



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71. During emergency conditions, it has been determined that exposures in excess of 10CFR20 limits may be required for protection of valuable property.

In accordance with PEP-03.7.6, what is the Emergency Worker Dose Limit?

- A. 10 Rem TEDE, 50 Rem to extremities.
- B. 10 Rem TEDE, 100 Rem to extremities.
- C. 25 REM TEDE, 50 Rem to extremities.
- D. 25 Rem TEDE, 100 Rem to extremities.

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72. While on watch in the Control Room as the Unit One (1) Control Operator you are informed of a class C fire in a cabinet near the center of the Unit One (1) Breezeway. According to PFP-13, General Fire Plan, you must sound the Fire Alarm.

Which **ONE** of the following describes an announcement AND additional actions which must be performed?

- A. Announce that the use of the PA and radio is restricted to fire communications, then monitor the RTGB, particularly the Feedwater system.
- B. Announce that the use of the PA and radio is restricted to fire communications, then monitor the RTGB, particularly the Reactor Recirc Flow Control system.
- C. Announce that the use of the radio is restricted to fire communications, then monitor the RTGB, particularly the Feedwater system. Use of the PA is not restricted.
- D. Announce that the use of the radio is restricted to fire communications then monitor the RTGB, particularly the Reactor Recirc Flow Control system. Use of the PA is not restricted.

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73. Unit Two (2) Control Operator has inserted a manual reactor scram. The plant status matrix scram status box in the lower right hand corner of the ERFIS screen has changed from "NO SCRAM" (in green) to "SCRAM RODS" (in red).

Which **ONE** of the following describes the meaning of "SCRAM RODS" (in red) on the ERFIS screen?

- A. At least one control rod has NOT fully inserted.
- B. All control rods are inserted to or beyond position 00.
- C. The scram air header is depressurized and all control rods are fully inserted.
- D. The control rod insertion time limit was NOT met during the scram and all rods are at or beyond position 00.

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74. After entering EOP-01-LPC, Level Power Control, the crew has progressed to conducting LEP-02, Alternate Control Rod Insertion, with SLC initiated and vessel level being maintained between LL-4 and +80". While executing LEP-02 a SCRAM signal is inserted and ALL RODS FULLY INSERT.

Which **ONE** of the following describes the actions to be taken per EOP guidance?

- A. You are not required to return to "Are All Control Rods Inserted to or Beyond 00". The crew may go straight to EOP-01-RVCP, Reactor Vessel Control Procedure, since level is being maintained below RVCP entry conditions and LPC is no longer required.
- B. You are required to return to "Are All Control Rods Inserted to or Beyond 00" and answer the question YES and execute that path prior to going to EOP-01-RVCP, Reactor Vessel Control Procedure.
- C. You are required to return to "Are All Control Rods Inserted to or Beyond 00" and answer the question YES and execute that path prior to going to EOP-02-RSP, Reactor Scram Procedure.
- D. You are not required to return to "Are All Control Rods Inserted to or Beyond 00". The crew may go straight to EOP-01-RSP, Reactor Scram Procedure, and determine if level can be restored to greater than 170" prior to entering EOP-01-RVCP, Reactor Vessel Control Procedure.

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75. Which **ONE** of the following describes implementation guidance IAW 00I-01.02, Conduct of Operations, for Transient Annunciator Response and accurately describes performance deviations associated with Transient Annunciator Response when compared to Normal Annunciator Response?

- A. Transient Annunciator Response is only allowed when in AOP's and EOP's.  
When exiting Transient Annunciator Response, alarms that are sealed in as a result of the event or transient are not required to be addressed unless directed to by the SRO.
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- B. Transient Annunciator Response is only allowed when in AOP's and EOP's.  
When exiting Transient Annunciator Response, alarms that are sealed in as a result of the event or transient are required to be addressed.
- C. Transient Annunciator Response is allowed when in Transient Conditions even if AOP's and EOP's are not entered.  
When exiting Transient Annunciator Response, alarms that are sealed in as a result of the event or transient are not required to be addressed unless directed to by the SRO.
- D. Transient Annunciator Response is allowed when in Transient Conditions even if AOP's and EOP's are not entered.  
When exiting Transient Annunciator Response, alarms that are sealed in as a result of the event or transient are required to be addressed.

**END OF NRC RO EXAM**