

**Final Submittal**  
(Blue Paper)

**CATAWBA DECEMBER 2005 EXAM**

**05000413/2005301 & 05000414/2005301**

**DECEMBER 5 - 8, 2005**  
**DECEMBER 14, 2005 (WRITTEN)**

**FINAL RO**

**WRITTEN EXAMINATION**

CATAWBA NUCLEAR STATION  
RO NRC EXAM

**RO  
NRC INITIAL LICENSE  
EXAMINATION**

FOR OFFICIAL USE ONLY

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

Applicant Information

Name:

Date:

Facility/Unit: CATAWBA

Region: I  II  III  IV

Reactor Type:  W  CE  BW  GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

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

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

Results

Examination Value \_\_\_\_\_ Points

Applicant's Score \_\_\_\_\_ Points

Applicant's Grade \_\_\_\_\_ Percent

**CATAWBA NUCLEAR STATION  
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**Question: 05-01**

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- 1 Pt(s)      Assuming all plant systems respond as designed, which one set of signals provides a correct list of additional functions caused by a reactor trip?
- A.      Main feedwater isolation valves receive a close signal  
         Atmospheric dump valves receive a block signal  
         Main turbine receives a trip signal
  - B.      Main feedwater isolation valves receive a close signal  
         Atmospheric dump valves receive a block signal  
         Main feedwater pumps receive a trip signal
  - C.      Main feedwater isolation valves receive a close signal  
         Main turbine receives a trip signal  
         Main feedwater pumps receive a trip signal
  - D.      Atmospheric dump valves receive a block signal  
         Main turbine receives a trip signal  
         Main feedwater pumps receive a trip signal

**CATAWBA NUCLEAR STATION  
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**Question: 05-02**

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1 Pt(s)

Given the following:

- Indicated pressurizer level rapidly increases to 100%
- Containment pressure and humidity are increasing
- Pressurizer pressure is slowly decreasing

Which ONE of the following events is the cause for these indications?

- A. Pressurizer level transmitter diaphragm rupture
- B. Pressurizer surge line break
- C. Pressurizer impulse line break
- D. Pressurizer reference leg break

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-03**

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- 1 Pt(s)      Which one the following design features ensures that primary coolant leakage is isolated or contained during a small break LOCA?
- A.      High flow from the reactor coolant pump seal leakoffs closes the seal return isolation valves.
  - B.      High flow from the reactor coolant pump thermal barrier closes the outlet isolation valve.
  - C.      1EMF-46A/B (Train A/B KC System Rad Monitor) Trip 2 automatically closes the KC surge tank vent isolation valves.
  - D.      High flow from the seal return heat exchanger closes the seal return isolation valves.

**CATAWBA NUCLEAR STATION  
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**Question: 05-04**

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- 1 Pt(s)      At what point, during a large LOCA, is sufficient core cooling by natural circulation lost?
- A. As soon as water level in the reactor vessel decreases to less than 100%
  - B. As soon as water level in the pressurizer decreases to less than 0%
  - C. As soon as saturated conditions are reached in the reactor coolant loops
  - D. As soon as steam voiding occurs in the steam generator tubes

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-05**

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1 Pt(s)

Given the following conditions:

- Unit 2 is at 10% power
- 2A reactor coolant pump motor bearing temperature is 200°F and slowly increasing

What is the correct course of action per AP/2/A/5500/008 (Malfunction of Reactor Coolant Pump)?

- A. 2A NCP trip criteria are not currently met. Monitor 2A NCP and if pump trip criteria are exceeded, trip the reactor, and then trip 2A NCP.
- B. Trip 2A NCP, then shutdown the reactor to Mode 3.
- C. Trip the reactor, verify reactor power less than 5%, then trip 2A NCP.
- D. Reduce reactor power to less than 5% (without tripping the reactor), then trip 2A NCP.



**CATAWBA NUCLEAR STATION  
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**Question: 05-06**

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1 Pt(s)      Given the following initial conditions:

- 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in MANUAL
- 1NV-309 (Seal Water Injection Flow) in MANUAL
- pressurizer pressure is 2235 psig
- total seal water flow is 32 gpm
- charging line flow is 89 gpm

If pressurizer pressure is increased to 2300 psig, which one of the following sets of system parameter changes is correct?

- A. Charging line flow decreases and total seal water flow decreases
- B. Charging line flow decreases and total seal water flow remains the same
- C. Charging pump discharge header pressure increases and total seal water flow increases
- D. Charging pump discharge header pressure increases and total seal water flow remains the same

**CATAWBA NUCLEAR STATION  
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**Question: 05-07**

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1 Pt(s)      Given the following:

- Unit 1 experienced a safety Injection due to a LOCA coincident with a loss of offsite power (LOOP)
- 1AD-09 D/8, FWST 2/4 LO LEVEL alarm is LIT
- 1AD-07 F/8, KC TRAIN B TWO PUMP RUNOUT is LIT
- EP/1/A/5000/ES-1.3, Transfer to Cold Leg Recirculation, is in progress

Which one of the following could have caused the "B" train KC pump runout condition?

- A. "B" train auxiliary building KC non-essential header isolation valves failed to close
- B. KC reactor building non-essential header break inside containment
- C. "A" and "B" train ND heat exchanger inlet valves failed open
- D. 1A1 and 1A2 KC pumps failed to restart following the LOOP

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-08**

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1 Pt(s)

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

- Channel III pressurizer pressure has failed low
- "Pzr Press Ctrl Select" switch is in the "1-2" position

How will a failure of the pressurizer pressure master to 100% demand affect pressurizer pressure?

- A. Pressurizer heaters will energize. No PORVs will open. Pressure will increase to the reactor trip setpoint.
- B. Pressurizer heaters will energize. 1NC-32B (Pzr PORV) and 1NC-36B (Pzr PORV) will cycle to maintain pressure between 2315 and 2335 psig.
- C. Pressurizer sprays will open. 1NC-34A (Pzr PORV) will open and remain open. Pressure will decrease to the reactor trip setpoint.
- D. Pressurizer sprays will open. 1NC-34A will open and reclose at 2185 psig. Pressure will decrease to the reactor trip setpoint.

**CATAWBA NUCLEAR STATION  
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**Question: 05-09**

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1 Pt(s)      Unit 2 has initiated bleed and feed per EP/2/A/5000/FR-H.1, Response to Loss of Heat Sink. Current S/G conditions are as follows:

<u>S/G</u>	<u>pressure (psig)</u>	<u>WR level</u>
2A	200, decreasing	2%, decreasing
2B	700, stable	10%, decreasing
2C	700, stable	7%, decreasing
2D	1000, increasing	31%, increasing

Once a source of feedwater is available, which one of these is the most desirable steam generator to establish feedwater flow to?

- A. 2A
- B. 2B
- C. 2C
- D. 2D

**CATAWBA NUCLEAR STATION  
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**Question: 05-10**

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1 Pt(s)      A caution statement in EP/1/A/5000/E-3, Steam Generator Tube Rupture, states that "Safety Injection must be terminated when termination criteria is met to prevent \_\_\_\_\_".

- A. over-filling the pressurizer
- B. over-filling the ruptured steam generator(s)
- C. over-cooling the reactor coolant system
- D. over-pressurizing the ruptured steam generator(s)

**CATAWBA NUCLEAR STATION  
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**Question: 05-11**

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1 Pt(s)

What is the minimum length of time that each vital instrument and control system battery is designed to carry its own loads and the loads of the other train related vital bus?

- A. 1 hours
- B. 2 hours
- C. 4 hours
- D. 8 hours

**CATAWBA NUCLEAR STATION  
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**Question: 05-12**

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1 Pt(s)      Unit 1 is at 50% power with the following events:

- AC power instrument bus 1ERPA is de-energized
- Pressurizer level control system input is swapped to channel 3-2
- Operators have implemented AP/1/A/5500/029, Loss of Vital or Aux Control Power

While 1ERPA is de-energized, how is pressurizer level being controlled?

- A. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in automatic with normal letdown
- B. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in automatic with excess letdown
- C. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in manual with excess letdown
- D. 1NV-294 (NV Pmps A&B Disch Flow Ctrl) in manual with normal letdown

**CATAWBA NUCLEAR STATION  
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**Question: 05-13**

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- 1 Pt(s)      Unit 2 battery charger 2ECD has failed and buss 2EDD is being supplied by battery 2EBD. Which of the following statements indicates the minimum voltage at which the battery must be removed from service and the reason for removal?
- A. 120 volts; to prevent damage to fed equipment
  - B. 115 volts; to prevent damage to fed equipment
  - C. 110 volts; to prevent cell reversal
  - D. 105 volts; to prevent cell reversal



**CATAWBA NUCLEAR STATION  
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**Question: 05-14**

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1 Pt(s)

Initial Conditions:

- Unit 1 and Unit 2 are operating at 100% power.
- 1A RN pump is in service.
- B train KC is in service.

Current Conditions:

- 1A RN pump tripped.
- 1B RN pump was started by the crew per AP/0/A/5500/020 (Loss of Nuclear Service Water).
- The OSM has directed that Unit 2 be removed from the RN System technical specification LCO due to upcoming scheduled work.
- Alignments are being made per OP/0/A/6400/006C, Enclosure 4.12A (Alignment for Single Pump Flow Balance Due to One Train A RN Pump and/or Its Associated D/G Inoperable).

Once alignments are made per OP/0/A/6400/006C, and the RN technical specification LCO no longer applies to Unit 2, which one of the following is still aligned to RN on Unit 1?

- A. 1A NS heat exchanger
- B. 1A train CA
- C. 1A KC heat exchanger
- D. The RN non-essential header

**CATAWBA NUCLEAR STATION  
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**Question: 05-15**

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1 Pt(s)      Given the following conditions:

- Unit 1 tripped during a loss of instrument air (VI) at 1600 hrs
- Unit 1 is being stabilized in hot standby

Based on these conditions, which one of the following evolutions could NOT be performed at 1615 hrs?

- A. Manually increasing S/G level using a CA flow control valve
- B. Manually controlling T-Avg by cycling the S/G PORVs
- C. Manually decreasing pressurizer pressure using pressurizer PORV
- D. Manually increasing pressurizer level using 1NV-294 (NV Pmps A & B Disch Flow Ctrl)

**CATAWBA NUCLEAR STATION  
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**Question: 05-16**

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1 Pt(s)      A loss of coolant accident outside containment has occurred on the residual heat removal system injection header.

The crew is performing Step 3 of EP/1/A/5000/ECA-1.2, LOCA Outside Containment, which states:

“Verify leak path is isolated as follows:”

Which ONE of the following indications is used to identify that the leak has been successfully isolated?

- A. ND Pump discharge pressure decreasing
- B. Pressurizer level increasing
- C. ND/NS room sump levels decreasing
- D. Reactor coolant pressure increasing

**CATAWBA NUCLEAR STATION  
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**Question: 05-17**

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1 Pt(s)

Given the following:

- EP/1/A/5000/ECA-1.1, Loss of Emergency Coolant Recirculation, has just been implemented
- Refueling Water Storage Tank (FWST) level is 4.5%

Which of the following procedure actions is performed first while attempting to restore recirculation?

- A. Initiate makeup to the FWST.
- B. Start one reactor coolant pump.
- C. Makeup to the NC system from the standby makeup pump.
- D. Secure all ECCS and NS pumps taking a suction from the FWST.

**CATAWBA NUCLEAR STATION  
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**Question: 05-18**

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1 Pt(s)

Given the following:

- Containment pressure is 4 psig
- All steam generator pressures are 150 psig
- EP/1/A/5000/ECA-2.1, Uncontrolled Depressurization of All Steam Generators, is in effect
- The OATC has been instructed to begin dumping steam using S/G PORVs to stabilize Thots

Which of the following lists the minimum actions required to allow the S/G PORVs to be manually positioned?

- A. Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- B. Depress the "SM PORV TRN A(B) RESET" pushbuttons  
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- C. Depress the "SM ISOL TRN A(B) RESET" pushbuttons  
Depress the "SM PORV TRN A(B) RESET" pushbuttons  
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton
- D. Depress the "ECCS TRN A" "RESET" pushbutton  
Depress the "SM ISOL TRN A(B) RESET" pushbuttons  
Depress the "SM PORV TRN A(B) RESET" pushbuttons  
Depress the "S/G PORV CTRL MODE" "MANUAL" pushbutton

**CATAWBA NUCLEAR STATION  
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**Question: 05-19**

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1 Pt(s)      Given the following conditions and sequence of events:

- The crew is responding to a continuous rod withdrawal per AP/1/A/5500/015 Case 2, Continuous Rod Motion
- Control rods have been placed in manual and rod motion has stopped
- Boron is being added with 1A boric acid transfer pump to return Tavg to Tref
- 1ETA experiences a loss of power
- The blackout sequencer re-energized 1ETA

Which choice states the minimum action(s), if any, required to be completed before the operator can secure the 1A boric acid transfer pump using its control switch?

- A. Reset the 1A diesel generator sequencer and then reset the 1A boric acid transfer pump
- B. Reset the 1A diesel generator sequencer
- C. Reset the 1A boric acid transfer pump
- D. No additional actions are required

**CATAWBA NUCLEAR STATION  
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**Question: 05-20**

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1 Pt(s)

Given the following conditions:

- Unit 1 at 45% power
- Loop "A" Thot fails high

Assuming no operator action, which one of the following statements correctly explains the initial effect of this Thot failure?

- A. Loop "A" OTDT setpoint increases
- B. Control rods step inward at a constant 48 steps per minute
- C. Charging flow increases
- D. Pressurizer level increases to the Hi level alarm setpoint

**CATAWBA NUCLEAR STATION  
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**Question: 05-21**

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1 Pt(s) Spent fuel assemblies are being shuffled in the Spent Fuel building when the following two (2) alarms are received simultaneously:

- 1RAD-2 A/2, 1EMF36 UNIT VENT GAS HI RAD is LIT
- 1RAD-2 F/5, CABINET 3-4 TROUBLE is LIT

The operator notes the following:

- 1EMF36 Operate and Trip 2 lights are LIT, the Trip 1 light is DARK
- All 1EMF42 (FUEL BLDG VENT MONITOR) module indications are DARK
- 1RAD-2 B/1, 1EMF42 FUEL BLDG VENT HI RAD is DARK
- ABUXF-1A and ABUXF-1B have tripped

Based on the EMF indications of panel 1RAD-2, which one of the following is the highest priority alarm response procedure action to take?

- A. Review and then verify automatic actions of 1RAD-2 A/2 for the 1EMF36 Trip 2 alarm even though spent fuel building ventilation is already in the required condition to allow fuel handling activities.
- B. Review automatic actions of 1RAD-2 B/1 for a 1EMF42 Trip 2. Take no action since spent fuel building ventilation would already be in the required condition to allow fuel handling activities.
- C. Review the probable cause guidance of 1RAD-2 F/5 for the failure of 1EMF42.
- D. Review the probable cause guidance of 1RAD-2 F/5 because both EMFs have malfunctions and no automatic actions have occurred.



**CATAWBA NUCLEAR STATION  
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**Question: 05-22**

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1 Pt(s)

Initial Conditions:

- Unit 1 is operating at 100% power
- EMF 71 (Steam Generator A Leakage) indicates 18 gpd
- Secondary Chemistry confirms the leak on 1A S/G
- EMF 33 (Condenser Air Ejector Exhaust) reads 210 CPM
- Charging system mismatch reads 12 gpm

Current Conditions:

- Unit 1 is in Mode 2 at 4% power
- Steam generator leakage has increased to 4 gpm

Per NSD 513 (Primary to Secondary Leak Monitoring Program) which one detection method is preferred:

1. At 100% power
  2. In Mode 2 at 4% power
- 
- A. 1. EMF 33  
2. Secondary system sampling
  - B. 1. EMF 33  
2. EMF 71
  - C. 1. EMF 71  
2. EMF 33
  - D. 1. Secondary system sampling  
2. EMF 33

**CATAWBA NUCLEAR STATION  
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**Question: 05-23**

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- 1 Pt(s)      Area radiation monitors functions are limited to detecting which of the following type events?
- A. High radiation detected during a normal waste gas release, seal water heat exchanger tube leak, waste gas storage tank rupture
  - B. High radiation detected during a normal waste gas release, waste gas storage tank rupture, fuel handling accident
  - C. Seal water heat exchanger tube leak, high radiation at solid waste processing, radiation in reactor coolant filters
  - D. Fuel handling accident, high radiation at solid waste processing, radiation in reactor coolant filters

**CATAWBA NUCLEAR STATION  
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**Question: 05-24**

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- 1 Pt(s)      Select the statement that represents a loss of containment integrity?
- A. Both lower personnel airlock doors closed with all seals deflated
  - B. Annulus doors blocked open for maintenance work
  - C. Submarine hatch is found open
  - D. Engineering discovery of major divider barrier seal degradation

**CATAWBA NUCLEAR STATION  
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**Question: 05-25**

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1 Pt(s)

Given the following:

- Unit 1 LOCA in progress
- All S/G pressures are 1000 psig
- The crew has implemented EP/1/A/5000/FR-C.1 (Response to Inadequate Core Cooling)

Which of the following statements explains the relationship between primary system temperature and steam generator pressure, and what affect does depressurizing S/Gs have on That temperatures?

- A. Reactor coolant hot leg temperatures in the S/Gs are approximately the same as CET temperatures.  
Depressurizing the S/G's would not decrease the That temperatures.
- B. Reactor coolant hot leg temperatures in the S/Gs are approximately the same as CET temperatures.  
Depressurizing the S/Gs would decrease That temperatures.
- C. Reactor coolant hot leg temperatures in the S/Gs are approximately at the saturation temperature for S/G pressure.  
Depressurizing the S/Gs would not decrease the That temperatures.
- D. Reactor coolant hot leg temperatures in the S/Gs are approximately at the saturation temperature for S/G pressure.  
Depressurizing the S/Gs would decrease That temperatures.

**CATAWBA NUCLEAR STATION  
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**Question: 05-26**

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1 Pt(s)      The required actions for a high reactor coolant activity event to limit site boundary dose is based on a \_\_\_\_\_.

- A. Main Steam Line Break
- B. Steam Generator Tube Rupture
- C. Small Break LOCA
- D. Loss of Containment Integrity

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-27**

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1 Pt(s)

Conditions at 1400 hrs:

- Unit 1 safety injection occurred due to a LOCA
- Reactor coolant (NC) system pressure is 915 psig
- NC Tcold temperatures are 535 °F
- Core Exit Thermocouples (CET) are 565 °F
- Crew has implemented EP/1/A/5000/FR-C.2, Response to Degraded Core Cooling
- The OSM has directed a cooldown to allow ND to be placed in service

Assuming temperatures have been stable since 1300 hrs, what is the maximum cooldown rate allowed per EP/1/A/5000/FR-C.2, and what is the lowest temperature that could be attained by 1600 hrs using that rate?

- A. Cooldown at 80 °F/hr to 375 °F on NC Tcolds
- B. Cooldown at 80 °F/hr to 405 °F on CETs
- C. Cooldown at 100 °F/hr to 335 °F on NC Tcolds
- D. Cooldown at 100 °F/hr to 365 °F on CETs

**CATAWBA NUCLEAR STATION  
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**Question: 05-28**

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1 Pt(s)

Why are the reactor coolant pumps (NCP) shutdown on a high-high containment pressure condition?

- A. Cooling water flow is isolated to the upper containment air handling units.
- B. Cooling water flow is isolated to the NCP seals.
- C. NCP seal water return path from containment is isolated.
- D. Cooling water flow is isolated to the NCP motor oil coolers.

**CATAWBA NUCLEAR STATION  
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**Question: 05-29**

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1 Pt(s)      Given the following plant conditions:

- Unit 1 is in Mode 3 at 400 °F
- Plant cooldown in progress to Mode 4
- Normal pressurizer spray is not available
- The crew has aligned auxiliary spray from the chemical and volume control system to cooldown the pressurizer

Which of the following is a caution expressed in OP/1/A/6200/001, Chemical and Volume Control System, related to this alignment?

- A. Potential for flashing the letdown line
- B. Isolating the charging flow path
- C. Inferior pressure control compared to normal spray
- D. Over cooling the pressurizer spray nozzle



**CATAWBA NUCLEAR STATION  
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**Question: 05-30**

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1 Pt(s)

Given the following conditions:

- Both trains of residual heat removal (ND) are in service
- ND heat exchanger outlet valves are full open
- ND train flows are 3300 gpm each
- Train "B" ND heat exchanger outlet valve is manually closed

Which one of the following would represent the final stabilized total system flow and inlet temperature for Train "A" ND heat exchanger?

	<u>Total System Flow</u>	Train "A" ND heat exchanger <u>Inlet Temperature</u>
A.	DECREASE	INCREASE
B.	REMAIN THE SAME	INCREASE
C.	REMAIN THE SAME	REMAIN THE SAME
D.	DECREASE	REMAIN THE SAME

**CATAWBA NUCLEAR STATION  
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**Question: 05-31**

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1 Pt(s)      Unit 1 is in Mode 1 with the following cold leg accumulator conditions:

CLA	1A	1B	1C	1D
Indicated Pressure (psig)	605	625	640	580
Indicated Level (%)	72	82	92	84

Based on the above accumulator parameters, how many CLAs are operable, and is Tech Spec 3.0.3 entered?

*References Provided*

- A. Three CLAs are operable.  
Enter Tech Spec 3.0.3.
- B. Three CLAs are operable.  
Do not enter Tech Spec 3.0.3.
- C. Two CLAs are operable.  
Enter Tech Spec 3.0.3.
- D. Two CLAs are operable.  
Do not enter Tech Spec 3.0.3.

**CATAWBA NUCLEAR STATION  
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**Question: 05-32**

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1 Pt(s)

Given the following Pressure Relief Tank (PRT) parameters:

	<u>0800 hrs</u>	<u>0810 hrs</u>
Temperature	71.8 °F	72.1 °F
Pressure	3.0 psig	3.9 psig
Level	72.5 %	72.9 %

Which one of the following valves passing full flow for 10 minutes would account for the 0810 values in the PRT?

- A. Letdown orifice line relief valve
- B. Pressurizer PORV
- C. Reactor coolant pump seal return line relief valve
- D. Residual heat removal pump suction line relief valve

**CATAWBA NUCLEAR STATION  
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**Question: 05-33**

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1 Pt(s)      Given the following conditions and sequence of events:

- Unit 1 is at 100 %
- Alternate cooling is aligned to 1A charging pump (NV)
- A safety injection occurs

Which system provided cooling to the 1A NV pump before the safety injection and what action is required (if any) after the safety injection to maintain cooling to 1A NV pump?

- A. Drinking water (YD)  
Maintain cooling from drinking water
- B. Drinking water  
Realign cooling from component cooling (KC)
- C. Nuclear service water (RN)  
Realign cooling from component cooling
- D. Nuclear service water  
Maintain cooling from nuclear service water

**CATAWBA NUCLEAR STATION  
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**Question: 05-34**

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1 Pt(s)      Given the following conditions:

- Unit 1 in Mode 4 cooling down to Mode 5
- Pressurizer level is 85%
- Pressurizer heater groups 1A and 1D are in MANUAL and ON
- Reactor coolant pumps (NCP) 1A and 1B are running
- An electrical fault results in the loss of 1TA and 1ETA

Five minutes later it is reported the pressurizer outflow cannot be verified.

Which of the following actions will reinitiate and then maintain a continuous pressurizer outflow?

- A. Energize pressurizer heater group 1B and close the spray valve for 1A NCP
- B. Start NCP 1D
- C. Increase the spray valve open position for NCP 1B
- D. Adjust charging and letdown to decrease pressurizer level to 80%

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-35**

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1 Pt(s)

Initial Conditions:

- Unit 1 was operating at 65% power.
- NI44 was removed from service per procedure and all appropriate bistables have been tripped.

Current Conditions:

- Water level in the exterior doghouse is 14"
- Operators attempted to manually trip the reactor but neither reactor trip breaker (RTB) opened.
- It has just been reported that all S/G NR levels are offscale low.
- Operators are manually inserting control rods.
- Operable NIs indicate ~46% power.

What is the condition of the main turbine and the reason for that condition?

- A. Turbine is online and must be manually tripped. Both RTBs are still closed.
- B. Turbine automatically tripped. Current S/G levels generated an automatic reactor trip signal.
- C. Turbine is online and must be manually tripped. 3 of 4 P9 bistables are not met.
- D. Turbine automatically tripped. AMSAC protection actuated.

**CATAWBA NUCLEAR STATION  
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**Question: 05-36**

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1 Pt(s)

Initial Conditions:

- Unit 1 was performing a heatup following a refueling outage
- NC Temperature was 400 °F
- NC pressure was 1600 psig
- "A" and "B" shutdown banks were withdrawn
- Containment Pressure Channel II failed high

Current Conditions:

- 1ERPD has lost power
- Containment pressure channels read:
  - Channel I: 0 psig
  - Channel II: +5 psig
  - Channel III: 0 psig
  - Channel IV: -5 psig

Which of the following statements explains the impact on the Engineered Safeguards Features (ESF) system and expected operator actions?

- A. Only Train "A" safety injection actuation logic was satisfied.  
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- B. Only Train "A" safety injection actuation logic was satisfied.  
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.
- C. Train "A" and "B" safety injection actuation logic were satisfied.  
Implement EP/1/A/5000/E-0, Reactor Trip or Safety Injection.
- D. Train "A" and "B" safety injection actuation logic were satisfied.  
Implement AP/1/A/5500/005, Reactor Trip or Inadvertent S/I Below P-11.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-37**

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1 Pt(s)

Given the following:

- Unit 1 is shutdown and being cooled down for an outage
- Primary temperature is 257 °F
- Upper containment temperature is 80 °F
- Lower containment temperature is 102 °F
- Control Rod Drive Mechanism fans are shutdown

Assuming no operator action, which one of the following explains the effect on containment cooling system operation as containment temperature continues to decrease?

- A. Chilled water flow control is automatically bypassed to prevent containment temperature from decreasing to less than 60 °F.
- B. Reduced heat load in containment will trip the containment chillers on low chilled water flow.
- C. Reduced heat load in containment will over pressurize the chilled water piping and trip the chilled water pumps.
- D. Chilled water flow control is automatically selected to "MAX COOL" to provide an additional heat load on the containment chillers.



**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-38**

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- 1 Pt(s)      Prior to which of the following actions should an operator reduce ice condenser glycol expansion tank level?
- A. Reducing the number of glycol chillers from 3 to 2
  - B. Aligning the ice condenser air handling units for defrost
  - C. Closing the glycol containment isolation valves
  - D. Reducing the number of glycol chillers from 2 to 1

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-39**

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1 Pt(s)      A LOCA has occurred on Unit 1. Given the following:

- Containment pressure peaked at 4.6 psig, decreased to 0.2 psig and then slowly increased to 0.5 psig
- The following signals have been reset:
  - Phase "A" containment isolation signal
  - Both trains of ECCS
  - Both D/G load sequencers
  - NS Train "A"

Which one of the following describes the current status of the containment spray (NS) system?

	<u>1A Train NS</u>	<u>1B Train NS</u>
A.	ON	ON
B.	ON	OFF
C.	OFF	ON
D.	OFF	OFF

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-40**

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1 Pt(s)      Given the following events:

- Unit 1 is at operating 50%
- Cycle burnup is 5 EFPD
- Control rods are in manual
- Turbine control is "MW OUT" and "1<sup>st</sup> STG OUT"
- One moisture separator reheater relief valve fails open

One minute later, how have turbine load and core reactivity been affected?

- A. Megawatt electric (MWe) has decreased  
Positive reactivity has been added
- B. MWe has increased  
Negative reactivity has been added
- C. MWe has increased  
Positive reactivity has been added
- D. MWe has decreased  
Negative reactivity has been added

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-41**

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1 Pt(s)

Given the following conditions:

- Unit 1 is at 95% power
- AP/1/A/5500/006, Loss of S/G Feedwater Case III, DFCS Not In Auto, is in effect
- 1CF-37 (S/G 1B CF Ctrl) feedwater regulating valve in automatic
- 1CF-39 (S/G 1B CF Byp Ctrl) feedwater regulating bypass valve in manual
- 1B steam generator level is 63% and slowly increasing

Select the correct statements that return 1B steam generator level control to automatic and results in a bumpless transfer.

- A. Decrease 1CF-39 by 5% and ensure 1CF-37 opens.  
Depress manual for 1CF-37.  
Depress automatic for 1CF-37 and 1CF-39.
- B. Ensure 1CF-37 demand is 100%.  
Stabilize S/G level within 2% of setpoint.  
Depress manual for 1CF-37.  
Depress automatic for 1CF-37 and 1CF-39.
- C. Manually open 1CF-39 to 100%.  
Stabilize S/G level within 2% of setpoint.  
Depress manual for 1CF-37 and 1CF-39.  
Depress automatic for 1CF-37 and 1CF-39.
- D. Increase 1CF-39 by 5% and ensure 1CF-37 closes.  
Depress manual for 1CF-37 and 1CF-39.  
Depress automatic for 1CF-37 and 1CF-39.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-42**

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1 Pt(s)

Unit 1 is being transferred to the Standby Shutdown Facility (SSF).

Following a transfer to the SSF, which one of the following valves receives power from 600VAC bus 1EMXS?

- A. CAPT #1 Trip And Throttle Valve
- B. 1CA-188 (S/G 1D CA Nozz Tempering Isol)
- C. 1CA-48 (CA Pmp #1 Flow to S/G 1C)
- D. 1CA-50A (CA Pmp #1 Disch to S/G 1C Isol)

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-43**

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1 Pt(s)      Given the following conditions and sequence of events:

0900      1B diesel generator breaker is closed and load is increased.

0910      1B diesel generator is operating in parallel per PT/1/A/4350/002B,  
Diesel Generator 1B Operability Test with the following readings:

- 4000 Volts
- 950 amps
- 5749 kilowatts (KW)
- 2900 kilovars (KVAR)
- Power Factor 0.95 lagging

0920      Main generator voltage is reduced from 21.7 kilovolts to 21.5 kilovolts  
per dispatcher request.

0955      1B D/G load is reduced to 1000 KW in preparation for shutdown.

1015      1B D/G is shutdown per the PT.

Assuming no D/G parameters were adjusted by the operator between 0910 and 0955, was the D/G KW limit exceeded (other than any momentary transients) and what was the resulting D/G test classified?

- A.    D/G KW limit was exceeded; test is an INVALID FAILURE
- B.    D/G KW limit was exceeded; test is an INVALID TEST
- C.    D/G KW limit was not exceeded; test is a VALID SUCCESS
- D.    D/G KW limit was not exceeded; test is an INVALID TEST

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-44**

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1 Pt(s)

Given the following conditions:

- Unit 2 is in Mode 6
- Core defueling is in progress
- One assembly is currently in the mast above the core
- Crews in the spent fuel pool (SFP) area are moving the most recently transferred assembly to its storage location
- 2B D/G and "B" main power are de-energized for outage related work
- 2EDE has been declared inoperable

Which one of the following action(s) is required per technical specifications?

- A. Immediately suspend core alterations and movement of irradiated fuel in the SFP area.
- B. Immediately suspend core alterations. Movement of irradiated fuel in the SFP area may continue.
- C. Within 1 hour, initiate actions to restore 2EDE to operable.
- D. Within 1 hour, initiate actions to restore affected busses for Low Temperature Overpressure Protection (LTOP) features.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-45**

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- 1 Pt(s)      What is the power supply for 1A D/G fuel oil booster pump?
- A. 120V AC
  - B. 125V DC
  - C. 208V AC
  - D. 250V DC



**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-46**

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1 Pt(s)

Initial Conditions:

- A Unit 1 containment air release (VQ) is in progress
- 1EMF39 (Containment Gas) Trip 2 setpoint is set to 1300 counts per minute (cpm) per the gas waste release permit
- 1EMF36 (Unit Vent Gas) is operable
- A small reactor coolant leak develops around an instrument line
- 1EMF39 countrate is 1000 cpm and increasing

Current Conditions:

- 1RAD-1 D/4, 1EMF-38/39/40 Containment Loss of Flow alarm is LIT

Which one of the following describes the response to this situation?

- A. 1EMF39 can no longer monitor containment atmosphere. The VQ release will continue indefinitely without manual operator action.
- B. 1EMF39 loss of flow alarm actuates a containment ventilation isolation (Sh) signal. The Sh signal stops the VQ release.
- C. 1EMF36 will detect the activity released and actuates a containment ventilation isolation (Sh) signal. The Sh signal stops the VQ release.
- D. 1EMF36 will detect the activity released and stops the VQ release.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-47**

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1 Pt(s)

Initial Conditions:

- Both Units operating at 100%
- 1B RN pump is in service

Current conditions:

- Unit 1 experienced a LOCA
- Unit 1 containment pressure is 4.2 psig
- Unit 2 is operating at 100%
- An emergency low pit level alarm is received on the "B" train RN pit

What capability provided by the RN system is lost based on the current plant conditions?

- A. VA (Auxiliary Building Ventilation) and VF (Spent Fuel Pool Ventilation) supply unit cooling water on both units.
- B. VA (Auxiliary Building Ventilation) and VF (Spent Fuel Pool Ventilation) supply unit cooling water on Unit 1 only.
- C. Makeup to NW (Containment Valve Injection) on Unit 1 only.
- D. Makeup to the spent fuel pool on both units.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-48**

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- 1 Pt(s)      VI system pressure has decreased to 78 psig. What is the status of the VI supply to VS valve (1VI-500) and the VS auto backup supply to VI valve (1VS-78)?
- A.    1VI-500 open, 1VS-78 open
  - B.    1VI-500 open, 1VS-78 closed
  - C.    1VI-500 closed, 1VS-78 open
  - D.    1VI-500 closed, 1VS-78 closed

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-49**

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1 Pt(s) Unit 2 was operating at 100% power with a containment air release (VQ) is in progress. Given the following:

- A LOCA occurs
- "B" Train safety injection failed to actuate and was performed manually when it was recognized by the crew
- The following indications are noted for:
  - Containment pressure
  - 2EMF-37 (Unit Vent Monitor)
  - E/S Load Sequencers status lights

Time	0200	0201	0202	0203
Containment pressure (psig)	1.2	2.5	2.8	3.1
2EMF-37 Trip 1 Light	LIT	LIT	LIT	LIT
2EMF-37 Trip 2 Light	DARK	LIT	LIT	LIT
E/S LOAD SEQ ACTUATED TRAIN "A" status light	LIT	LIT	LIT	LIT
E/S LOAD SEQ ACTUATED TRAIN "B" status light	DARK	DARK	LIT	LIT

Based on the above indications and conditions, what is the earliest time that an operator can be assured that 2VQ-3B (VQ Fan Suct From Cont Isol) has received a close signal?

- A. 0200
- B. 0201
- C. 0202
- D. 0203

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-50**

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1 Pt(s)      Given the following electrical loads:

- 1A reactor coolant pump (NCP)
- 1B condenser circulating water pump (RC)
- 1C hotwell pump (HWP)
- 1ATD transformer

Voltage decreases to 50% of normal on "A" main bus line and "A" main bus line is no longer synchronized with the "B" main bus line.

Which one of these breakers tripped when the electrical transient occurred?

- A. 1A reactor coolant pump safety breaker
- B. 1B circulating cooling water pump breaker
- C. 1C hotwell pump breaker
- D. 1ATD transformer feeder breaker

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-51**

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1 Pt(s)

Unit 1 tripped from 100% power with the following conditions:

- "B" Reactor trip breaker did not open
- EP/1/A/5000/ES-0.1 (Reactor Trip Response) in progress
- Enclosure 2 (NC Temperature Control) is in effect
- S/G PORVs are cycling in automatic
- "% STM DUMP DEMAND" indicates 0 %
- "STM DUMP CTRL" indicates 0%
- Main steam header pressure indicates 0 psig
- All MSIVs are open

Which of the following describes:

1. Which steam dump controller is in control initially?
  2. How will temperature control be accomplished after the steam dump control switch has been swapped to pressure control mode?
- A. 1. The load rejection controller is in control.  
2. Verify steam dumps automatically stabilize T-avg at 557°F.
- B. 1. The load rejection controller is in control.  
2. Manually operate steam dumps to stabilize T-avg at 557°F.
- C. 1. The plant trip controller is in control.  
2. Manually operate steam dumps to stabilize T-avg at 557°F.
- D. 1. The plant trip controller is in control.  
2. Verify steam dumps automatically stabilize T-avg at 557°F.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-52**

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1 Pt(s)      PT/1/A/4400/003B, Component Cooling (KC) Train 1B Performance Test is in progress. Given the following sequence of events:

1. 1KC-12 (KC Pump 1B1 Disch) is throttled such that it is ~10% open
2. 1B1 KC pump is started
3. 1KC-12 is throttled to achieve a flowrate of 3906 gpm

What problem is prevented by throttling the discharge valve to 10% open prior to starting the 1B1 KC pump in this procedure, and how will indicated amps change as 1KC-12 is throttled to achieve 3906 gpm flow?

- A. Prevents pump starting in a deadhead condition.  
Amps will increase as 1KC-12 is throttled.
- B. Prevents pump starting in a deadhead condition.  
Amps will decrease as 1KC-12 is throttled.
- C. Prevents pump starting in a runout condition.  
Amps will increase as 1KC-12 is throttled.
- D. Prevents pump starting in a runout condition.  
Amps will decrease as 1KC-12 is throttled.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-53**

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1 Pt(s)

Initial Conditions:

- 2A diesel load sequencer in "TEST"
- 1B nuclear service water (RN) pump running
- All other systems in normal alignment

Current Conditions:

- "B" RN pit level emergency low level reached

Based on current plant conditions, what is the status of the RN pumps?

- A. 1B is running  
1A, 2A, and 2B are off
- B. 1B and 2B are running  
1A and 2A are off
- C. 1A, 1B, and 2B are running  
2A is off
- D. 1A, 1B, 2A, and 2B are all running



**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-54**

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1 Pt(s)      Given the following control room indications:

- 1AD-8, A/7 VI LO PRESS alarm is LIT
- 0VIP5260 (VI&VS AIR PRESS) indicates 0 psig

Based on these indications, what are the positions of 1CF-37 (S/G 1B CF Ctrl) and 1RN-351 (KC HX 1B Outlet Throttle Valve)?

- A. 1CF-37 is open, 1RN-351 is open
- B. 1CF-37 is open, 1RN-351 is closed
- C. 1CF-37 is closed, 1RN-351 is open
- D. 1CF-37 is closed, 1RN-351 is closed

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-55**

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1 Pt(s)

Given the following:

- Unit 1 experienced a reactor trip from 100% power.
- The crew is currently taking actions in EP/1/A/5000/ES-0.1, Reactor Trip Response.
- Steam generator levels are being maintained at 39% using 1A and 1B CA pumps.
- Both trains of auxiliary feedwater (CA) are reset.
- 1AD-5, H/4 "CACST LO LEVEL" has just alarmed.

Based on the given conditions, what is the current status of the 1A and 1B CA Pumps and the suction source?

- A. Pumps running taking suction from the UST.
- B. Pumps running taking suction from the Hotwell.
- C. Pumps running taking suction from the RN system.
- D. Pumps tripped, a suction source must be manually aligned.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-56**

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1 Pt(s)

Given the following:

- The Spent Fuel Pool (SFP) Crane is parked over the New Fuel Elevator
- 1EMF-15 (Spent Fuel Pool Building Refueling Bridge Monitor) is de-energized
- A 300 pound test canister is located in the New Fuel Elevator
- The New Fuel Elevator is in the down position with power available
- Normal Radiation levels exist in the Spent Fuel Pool Building

Which one of the following correctly describes the New Fuel Elevator response if an operator attempts to raise it to the full up position?

- A. The No-Load light will be DARK and the New Fuel Elevator will raise.
- B. The No-Load light will be LIT and the New Fuel Elevator will raise.
- C. The New Fuel Elevator will raise if the SFP crane is moved to the other end of the pool. 1EMF-15 losing power has no effect on New Fuel Elevator movement.
- D. The New Fuel Elevator will raise if the SFP crane is moved to the other end of the pool and 1EMF-15 regains power and is clear of any alarm condition.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-57**

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1 Pt(s)      Given the following conditions:

- Unit 1 is in Mode 3
- Auxiliary feedwater (CA) pumps are maintaining steam generators levels
- Condensate (CM) and main feedwater (CF) systems are in high pressure cleanup alignment with 1A Hotwell and 1A Condensate Booster pumps in service
- Steam generators are at no load level and 550 psig
- The CF system is aligned to the CA nozzle

The OATC inadvertently depresses the "CF NOZZL" pushbutton on the "S/G 1A NOZZLE SEL" switch.

Which one of the following correctly describes the CA and CM/CF system alignments to S/G 1A?

- A. CA pump discharge flow remains aligned to the CA nozzle only. CM/CF system flow can be established to S/G 1A by throttling open the "CF BYP CTRL" valve.
- B. CA pump discharge flow remains aligned to the CA nozzle only. CM/CF system flow can not be established to S/G 1A without a main feedwater pump in service.
- C. CA pump discharge flow is now aligned to both the CA and CF nozzles. CM/CF system flow can be established to S/G 1A by throttling open the "CF BYP CTRL" valve.
- D. CA pump discharge flow is now aligned to both the CA and CF nozzles. CM/CF system flow can not be established to S/G 1A without a main feedwater pump in service.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-58**

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1 Pt(s)

Initial Conditions:

- Unit 1 is at 53% power
- 3 RC pumps are in operation
- Both CF pumps are in operation

Current Conditions:

- Main condenser vacuum is 19.7" and slowly decreasing
- 1A CF pump condenser vacuum is 16.5" and slowly decreasing
- 1B CF pump condenser vacuum is 17.5" and slowly decreasing

What equipment failure accounted for the current condition, and what is the current status of the main turbine and the CF pumps?

- A. Steam supply valve to the air ejectors (1SA-24) failed closed.  
The main turbine continues to run; both CF pumps continue to run.
- B. One RC pump has tripped.  
The main turbine continues to run; both CF pumps continue to run.
- C. Steam supply valve to the air ejectors (1SA-24) failed closed.  
The main turbine is tripped; 1A CF pump tripped and 1B CF pump continues to run.
- D. One RC pump has tripped.  
The main turbine is tripped; 1A CF pump tripped and 1B CF pump continues to run.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-59**

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- 1 Pt(s)      Which of the following automatic actions are designed to prevent contaminated liquids from reaching Lake Wylie?
- A.    Liquid releases from the monitor tank building are terminated on low or loss of RL flow.
  - B.    Auxiliary Building Floor Drain Tank discharge is directed to the monitor tank building on 1EMF-52 (Clean Area Floor Drain Monitor) Trip 2.
  - C.    Turbine building sump pump flows are directed to the monitor tank building on 1EMF-31 (Turbine Building Sump) Trip 2.
  - D.    Liquid releases from the auxiliary building are terminated on low or loss of RN flow.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-60**

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1 Pt(s)      Given the following information related to Waste Gas (WG) Decay Tank "C":

- H2 concentration is 4.7%
- O2 concentration is 4.2%

Which of the following action(s) (if any) is required to be performed per station Selected License Commitments (SLCs)?

- A. Immediately suspend all additions to the WG decay tanks and reduce only H2 concentration to less than 4% by volume.
- B. Immediately suspend all additions to the WG decay tanks and reduce only O2 concentration to less than 4% by volume.
- C. Immediately reduce only H2 concentration to less than 4% by volume.
- D. No action required. H2 and O2 concentrations are within limits.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-61**

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1 Pt(s)

Given the following:

- Both trains of SSPS are in "TEST"
- VP (Containment Purge) is in operation
- A spent fuel assembly has just been dropped in the refueling canal as it was being moved towards the transfer car
- Bubbles are noted breaking the surface

What effect will this accident have on 1EMF-17 (REACTOR BLDG REFUEL BRIDGE) and 1EMF-39L (CONTAINMENT GAS HI RAD), and what effect will this have on VP operation?

- A. 1EMF-17 and 1EMF-39L will alarm.  
VP continues to operate.
- B. 1EMF-17 will alarm, 1EMF-39L will not alarm.  
VP secures.
- C. 1EMF-17 will alarm, 1EMF-39L will not alarm.  
VP continues to operate.
- D. 1EMF-17 and 1EMF-39L will alarm.  
VP secures.



**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-62**

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1 Pt(s)      Unit 1 was operating at 100%. Given the following events and conditions:

- A tornado completely destroys the switchyard
- 1A and 1B D/Gs failed to start due to fouled fuel oil
- The crew has implemented EP/1/A/5000/ECA-0.0, Loss of All AC power
- Controls have been transferred to the SSF
- UST level is 3%
- CACST level is 1%

What are the minimum actions required to maintain a suction source for the turbine driven auxiliary feedwater pump (CAPT)?

- A. None, condenser circulating water was automatically aligned when low suction pressure was reached.
- B. Defeat the low suction pressure trip, break vacuum, and manually align suction from the condenser hotwell.
- C. Locally open nuclear service water assured supply valves.
- D. None, condenser circulating water was automatically aligned when controls were transferred to the SSF.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-63**

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1 Pt(s)

Given the following conditions:

- Fire protection system malfunctions have allowed a fire, which started in Unit 1 cable room, to spread to the Unit 2 cable room and control room
- Crews are transferring control to the Safe Shutdown Facility (SSF)

Which one of the following evolutions can be performed using controls available within the SSF once control function is transferred to the SSF?

- A. Energize 1EMXA from the SSF diesel generator.
- B. Increase pressurizer pressure with "D" pressurizer heater sub-banks.
- C. Throttle auxiliary feedwater flow to B Steam Generator using its flow control valve.
- D. Decrease pressurizer level using the reactor coolant pump seal return header.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-64**

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1 Pt(s)

Initial Conditions:

- Unit 1 reactor coolant system cooldown and depressurization was in progress
- Letdown was isolated

Current Conditions:

- 1NV-37A (Pressurizer Aux Spray) is failed open
- The crew is responding per EP/1/A/5000/FR-I.1, Response to High Pressurizer Level

Which of the following actions completes the isolation of the auxiliary spray flow in accordance with EP/1/A/5000/FR-I.1 and how will this isolation impact pressurizer level and NCP seal injection flow?

- A. Throttle 1NV-294 (NV PMPS 1A & 1B Discharge Control) to 47 gpm  
Pressurizer level increases  
NCP's lose seal injection flow
- B. Close 1NV-312A and 1NV-314B (Charging Line Containment Isolations)  
Pressurizer level increases  
NCP's continue to receive seal injection flow
- C. Close 1NV-312A and 1NV-314B (Charging Line Containment Isolations)  
Pressurizer level decreases  
NCP's lose seal injection flow
- D. Throttle 1NV-294 (NV PMPS 1A & 1B Discharge Control) to 32 gpm  
Pressurizer level decreases  
NCP's continue to receive seal injection flow

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-65**

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- 1 Pt(s)      A condensate system (CM) startup is in progress per OP/1/A/6250/001, Condensate and Feedwater. 1CM-887 (CM Slow Fill Isol Valve) is opened until the "CM SYS FILL LEVEL HI" status light on 1SI-17 is lit. What is the significance of this indication and how was the fill accomplished?
- A. CM has been filled between the hotwell and the inlet of the main feed pumps. Fill was completed using gravity; no hotwell pump was necessary.
  - B. CM has been filled between the hotwell and the inlet of the main feed pumps. Fill was completed using gravity and a hotwell pump.
  - C. CM has been filled between the hotwell and the inlet of the upper surge tank dome. Fill was completed using gravity; no hotwell pump was necessary.
  - D. CM has been filled between the hotwell and the inlet of the upper surge tank dome. Fill was completed using gravity and a hotwell pump.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-66**

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1 Pt(s)

An operator is responding to an emergency situation. Which of the following correctly states the minimum actions required by the operator prior to using an operating procedure which contains signoffs and is normally stored in a location outside the control room in accordance with OMP 1-4 (Use of Procedures)?

- A. The operator is required to verify the field copy against the control room CONTROL COPY prior to use.
- B. The operator is required to make a working copy from the field copy prior to use. The operator must also ensure that the CONTROL COPY stamp from the field copy is displayed on the working copy.
- C. The operator is required to make a working copy from the field copy prior to use. The operator must also ensure that the CONTROL COPY stamp from the field copy is not displayed on the working copy.
- D. The operator is permitted to use the field copy which is a CONTROL COPY.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-67**

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1 Pt(s)

In accordance with NSD 509 (Communications Standards), under which of the following conditions can the Control Room Supervisor waive the requirement to announce alarms to the control room team?

- A. The same annunciator(s) repeatedly alarming during surveillance testing.
- B. Expected annunciators during the immediate actions of a safety injection emergency.
- C. Status of a local annunciator panel alarm reported to the control room.
- D. Priority and non-priority OAC alarms.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-68**

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1 Pt(s)

Given the following:

- Unit 1 is in Mode 3.
- Reactor coolant system (NCS) pressure is 2750 psig.

What is the required Tech Spec action for this condition?

- A. Reduce NCS pressure to less than 2485 psig within 5 minutes.
- B. Reduce NCS pressure to less than 2735 psig within 5 minutes.
- C. Reduce NCS pressure to less than 2485 within 1 hour.
- D. Restore NCS pressure to less than 2735 within 1 hour.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-69**

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1 Pt(s)

Given the following:

- Unit 1 and 2 are operating at 100%
- One single steam generator tube fully shears on each unit
- The crews are responding per EP/1(2)/A/5000/E-3, Steam Generator Tube Rupture, preparing to perform the initial reactor coolant system cooldown to the required core exit thermocouple temperature using steam dumps.

Based on the differences between Unit 1 and Unit 2 steam generator design, which unit would have a lower leakage rate and which unit would reach the target temperature first?

(Assume identical cores and steam dump performance.)

- A. Unit 1 would have less leakage and Unit 1 would reach required core exit temperature first.
- B. Unit 1 would have less leakage and Unit 2 would reach required core exit temperature first.
- C. Unit 2 would have less leakage and Unit 1 would reach required core exit temperature first.
- D. Unit 2 would have less leakage and Unit 2 would reach required core exit temperature first.



**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-70**

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1 Pt(s)      The following conditions exist on Unit 1:

- MODE 3 at normal operating temperature and pressure, preparing for a reactor startup
- The reactor coolant system (NC) has been diluted to the estimated critical boron concentration
- 1KC-132 (Letdn Hx Otlit Temp Ctrl) control is in MANUAL
- All other controls are in AUTOMATIC and functioning NORMALLY
- Letdown flow is decreased from 100 gpm to 50 gpm

Assuming NO other manipulations, over the next hour, Source Range counts will?

- A. INCREASE due to warmer NC water exiting the letdown heat exchanger
- B. INCREASE due to cooler NC water exiting the letdown heat exchanger
- C. DECREASE due to warmer NC water exiting the letdown heat exchanger
- D. DECREASE due to cooler NC water exiting the letdown heat exchanger

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-71**

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1 Pt(s)

Given the following:

- Unit 1 is operating at 100%
- The feedwater temperature input to the thermal power best estimate (TPBE) was incorrectly calibrated to 7°F less than actual feedwater temperature
- Calibration of the power range nuclear instruments (NIs) are being performed

How will TPBE power compare to actual thermal power and how will adjustment of the NIs be affected using the calculated value of TPBE?

- A. TPBE is lower than actual power.  
NI adjustment will be less conservative.
- B. TPBE is higher than actual power.  
NI adjustment will be less conservative.
- C. TPBE is lower than actual power.  
NI adjustment will be more conservative.
- D. TPBE is higher than actual power.  
NI adjustment will be more conservative.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-72**

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- 1 Pt(s)      A Duke Energy radiation worker current year Total Effective Dose Equivalent (TEDE) is 1500 mrem. If he is expected to receive 100 mrem per hour during a repair job, how many hours, if any, can he work before reaching the Dose Report EXCLUDE limit? (Assume any appropriate dose extensions have been approved to reach this limit.)
- A. None, the worker has already exceeded the EXCLUDE limit.
  - B. 1 hour
  - C. 3 hours
  - D. 5 hours

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-73**

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1 Pt(s)      The initial flush of penetration M-347 (Letdown Line Penetration) is being performed per OP/1/A/6200/001, Chemical and Volume Control System, in preparation for type "C" leak rate testing of the penetration.

What is the purpose of the flush, and what group determines termination criteria?

- A. The flush reduces local dose rates for the penetration testing. RP ALARA group determines termination criteria based on dose reduction.
- B. The flush reduces local dose rates for the penetration testing. Radwaste Chemistry determines termination criteria based on storage capacity.
- C. The flush ensures penetration valve seating surfaces are clear of debris. Valve engineer determines termination criteria based on adequate sealing.
- D. The flush ensures penetration valve seating surfaces are clear of debris. Radwaste Chemistry determines termination criteria based on storage capacity.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-74**

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- 1 Pt(s)      Unit 1 is in Mode 3 when an active fire occurs located in an area designated "SSF Dedicated Fire Area" per AP/0/A/5500/045, Plant Fire. How are standby shutdown facility (SSF) controls utilized, and what effect, if any, will this have on operation of the BB (Steam Generator Blowdown) system?
- A. Full transfer to the SSF.  
No effect, the BB system will continue to operate.
  - B. Partial transfer to the SSF.  
The BB system will be secured.
  - C. Full transfer to the SSF.  
The BB system will be secured.
  - D. Partial transfer to the SSF.  
No effect, the BB system will continue to operate.

**CATAWBA NUCLEAR STATION  
RO NRC EXAM**

**Question: 05-75**

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1 Pt(s)      Given the following events:

- Unit 2 Alert declared
- Emergency Notification Sheet signed and handed to you for transmittal

Which of the following is a complete list of agencies required to be contacted within 15 minutes of the declaration of the Alert?

- A. State and county warning points
- B. State warning points and NRC Operations Center
- C. County warning points and NRC Operations Center
- D. State and county warning points and the NRC Operations Center

## EXAM KEY AND PROVIDED REFERENCES

Q	A	REFERENCE	Q	A	REFERENCE
1	A		51	B	
2	D		52	C	
3	B		53	C	
4	D		54	C	
5	C		55	A	
6	A		56	D	
7	A		57	A	
8	A		58	C	
9	B		59	A	
10	B		60	B	
11	B		61	D	
12	C		62	A	
13	D		63	B	
14	C		64	B	
15	D		65	D	
16	D		66	D	
17	D		67	A	
18	A		68	B	
19	A		69	A	
20	C		70	B	
21	A		71	D	
22	A		72	C	
23	D		73	A	
24	A		74	B	
25	D		75	A	
26	B		76	A	
27	C		77	B	PZR LEVEL TO VOLUME GRAPH
28	D		78	A	
29	D		79	B	
30	B		80	B	
31	C	TS 3.5.1 AND OAC GRAPH	81	B	
32	C		82	D	
33	B		83	A	
34	A		84	A	
35	D		85	C	
36	D		86	C	
37	B		87	C	
38	C		88	D	
39	D		89	C	TS 3.4.16 & OAC CLA GRAPH
40	A		90	B	
41	C		91	D	
42	D		92	C	
43	D		93	B	
44	A		94	C	
45	B		95	B	ES-1.2 pages 17,18,19, 32, and 33
46	D		96	A	
47	B		97	C	
48	D		98	A	
49	C		99	D	
50	A		100	C	