

Final Submittal

**VOGTLE MAY 2005 EXAM
50-424, 425/2005-301**

**MAY 17 - 25, 2005
MAY 27, 2005 (WRITTEN)**

Reactor Operator Written Examination

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

Applicant Information

Name:	
Date:	Facility/Unit: Vogtle Nuclear Plant
Region: ii	Reactor Type: W
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

1.

Which ONE of the following correctly states the order of components through which 480 VAC to 260 VAC power flows to the Control Rod Drive Mechanisms?

- A. Motor Starting Breakers, then Motor Generator Sets, then Power Cabinets, then Reactor Trip Breakers
- B. Power Cabinets, then Motor Starting Breakers, then Motor Generator Sets, then Reactor Trip Breakers
- C. Motor Starting Breakers, then Motor Generator Sets, then Reactor Trip Breakers, then Power Cabinets
- D. Motor Generator Sets, then Motor Starting Breakers, then Reactor Trip Breakers, then Power Cabinets

2.

ALB08-F03, RCP FRAME HI VIBRATION, is in alarm with both RCP #1 frame vibration channels reading 10 mils.

Which ONE of the following correctly describes the required actions?

- A. The alarm is valid, secure RCP #1.
- B. Continue operation of RCP #1 and frequently monitor vibrations.
- C. The alarm is invalid; therefore, RCP #1 may continue to run without any increased monitoring of vibrations.
- D. Secure RCP #1 ONLY if vibration rate of increase exceeds 0.2 mils per hour.

3. Unit 1 reactor power is 6% Rated Thermal Power with all four RCPs running. The following Loop 2 and 3 RCP indications are noted by the Control Room Staff.

Loop 2 RCP: Motor Bearing Temperature = 195 °F
Motor Stator Winding Temperature = 312 °F
Seal Water Inlet Temperature = 224 °F
RCP Shaft Vibration = 14 mils
RCP Frame Vibration = 3 mils

Loop 3 RCP: Motor Bearing Temperature = 175 °F
Motor Stator Winding Temperature = 310 °F
Seal Water Inlet Temperature = 226 °F
RCP Shaft Vibration = 16 mils
RCP Frame Vibration = 4 mils

Based on the above indications, assuming the required operator actions are taken, which ONE of the following describes the response of the affected loop Tave and the reason for the affect on Tave?

- A. Loop 2 Tave will initially decrease due to securing Loop 2 RCP.
- B. Loop 2 Tave will initially increase due to securing Loop 2 RCP.
- C. Loop 3 Tave will initially decrease due to securing Loop 3 RCP.
- D. Loop 3 Tave will initially increase due to securing Loop 3 RCP.

4.

The following Unit 1 conditions exist:

- Reactor is at 100% Rated Thermal Power
- PRZR LVL CNTL SELECT Switch is selected to CH 459 / 460
- PRZR LVL REC SEL Switch is selected to L-459
- LI-459 (Pressurizer Level Indicator) fails low
- Operators enter 18001-C, Primary Systems Instrumentation Malfunctions

Which ONE of the following correctly states the plant's expected response and correct operator actions?

- A. LV-459 (Letdown Isolation Valve) fully closes then HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening HV-8149B, then opening LV-459 and LV-460.
- B. HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close then LV-459 (Letdown Isolation Valve) fully closes. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening HV-8149B, then opening LV-459 and LV-460.
- C. LV-459 (Letdown Isolation Valve) fully closes then HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening LV-459 and LV-460, then opening HV-8149B.
- D. HV-8149A, B, and C (Letdown Orifice Isolation Valves) fully close then LV-459 (Letdown Isolation Valve) fully closes. After de-selecting the failed channel and ensuring letdown valves closed, restore letdown by opening LV-459 and LV-460, then opening HV-8149B.

5.

Unit 1 was at 100% Rated Thermal Power (RTP) for two weeks following a refueling outage when the following sequence of events occurred:

<u>Time</u>	<u>Actions / Condition</u>
13:00:00	Plant at 100% RTP
13:05:00	Plant at 85% RTP (Ramp down due to feedwater problems)
14:00:00	- VCT level = 30% - VCT auto make-up begins - The air line supplying 1FV-0110A (Boric Acid to Blender Valve) completely severs
14:01:00	Current time.

Assuming no operator action, which ONE of the following correctly states control room indications that the operator will receive?

- A. BORIC ACID FLOW DEVIATION Annunciator will NOT alarm. RCS temperature will rise.
- B. BORIC ACID FLOW DEVIATION Annunciator will alarm. RCS temperature will rise.
- C. BORIC ACID FLOW DEVIATION Annunciator will NOT alarm. RCS temperature will lower.
- D. BORIC ACID FLOW DEVIATION Annunciator will alarm. RCS temperature will lower.

6.

Unit 1 has just completed a cooldown via the RHR system. The following data was collected:

Today is May 27.

<u>Time (hrs)</u>	<u>RCS Temperature (°F)</u>	<u>RCS Pressure (psig)</u>
0100	300	350
0115	275	350
0130	250	350
0145	228	350
0200	200	350
0215	182	350
0230	147	350
0245	130	350
0300	100	350

Which ONE of the following correctly states the actions required by Technical Specifications? (Reference provided)

- A. No Technical Specification REQUIRED ACTION covers the plant conditions. Enter LCO 3.0.3.
- B. Perform Technical Specification required actions to restore parameters to within limits within 30 minutes. The RCS must be determined to be acceptable for continued operation by May 30 at 0230 hours.
- C. Perform Technical Specification required actions to restore parameters to within limits within 30 minutes. The RCS must be determined to be acceptable for continued operation by May 30 at 0300 hours.
- D. Perform Technical Specification required actions to immediately begin restoring parameters to within limits AND determine the RCS is acceptable for continued operation prior to entering Mode 4.

7.

The following Unit 1 conditions exist:

- Operators have initiated 19221-C, FR-C.1, "Response to Inadequate Core Cooling"
- The 'A' Safety Injection Pump (Intermediate Head Safety Injection) is not available
- The 'B' Safety Injection Pump (Intermediate Head Safety Injection) flow rate is 800 gpm.
- RVLIS Full Range Level is 28% and slowly lowering
- Core Exit Thermocouples are 720°F and slowly rising
- RCS pressure is 1800 psig
- NR Steam Generator levels are 35% and slowly rising
- Reactor Coolant Pumps have been secured

Which ONE of the following would be the next major action to mitigating the core cooling challenge?

- A. Depressurize all intact steam generators using steam dumps or ARVs to depressurize RCS down to the SI accumulator and SI injection pressures.
- B. Depressurize the RCS down to the SI accumulator and SI injection pressures by opening available pressurizer PORVs.
- C. Restart one RCP in a loop with an intact steam generator to provide forced two-phase flow for initiating RCS depressurization.
- D. Allow Intermediate Head Safety Injection to continue adding inventory, which will cool the RCS.

8.

Unit 1 conditions are as follows:

- PRZR PRESS CNTL SELECT Switch is selected to 457 / 456
- Reactor is at 100% Rated Thermal Power
- PT-456 (Pressurizer Pressure Transmitter) has failed off scale high
- No operator actions have been taken
- At a later time Pressurizer Relief Tank (PRT) Parameters indicate:
 - Pressure = 1 psig
 - Temperature = 216 °F
 - Level = 90%

Which ONE of the following correctly states the current status of the Reactor and the PRT?

- A. Reactor trips on low pressurizer pressure. PRT rupture disks have blown.
- B. Reactor does not trip. PRT rupture disks have blown.
- C. Reactor trips on low pressurizer pressure. PRT rupture disks have not blown.
- D. Reactor does not trip. PRT rupture disks have not blown.

9.

The following conditions exist on Unit 1:

- Reactor is at 30% Rated Thermal Power
- NSCW Pumps 1 and 3 are running
- CCW Pumps 3 and 5 are running
- ACCW Pump 1 is running

CCW Pump 3 trips.

Which ONE of the following annunciators will provide adequate indication of the reason for the pump trip?

- A. CCW TRAIN A SURGE TANK LO-LO LEVEL
- B. CCW TRAIN A LO FLOW
- C. CCW TRAIN A SURGE TK MAKE UP LVL
- D. CCW TRAIN A LO HDR PRESS

10.

The following conditions exist on Unit 2:

- A reactor trip and safety injection have occurred.
- No reactor coolant pumps are running.
- RCS pressure is 1335 psig and lowering.
- Pressurizer level is 100% and stable.
- RCS hot leg temperatures indicate 578 °F.
- Average of the five highest CETs on the IPC indicate 585 °F.
- Containment pressure is 4.5 psig.
- All steam generator narrow range levels indicate 8%.
- 200 gpm auxiliary feedwater flow is being supplied to each steam generator.

Which ONE of the following describes the correct course of action with respect to Safety Injection and the reason for that course of action?

- A. Do not terminate safety injection because of inadequate subcooling and inadequate RCS inventory.
- B. Do not terminate safety injection because of inadequate RCS inventory and inadequate secondary heat removal capability.
- C. Do not terminate safety injection because of inadequate subcooling and inadequate secondary heat removal capability.
- D. Safety injection may be terminated because all termination criteria are met.

11.

Unit 1 is operating at 100% rated thermal power with pressurizer level at 60% and both pressurizer spray valves in manual and shut while I&C investigates erratic responses.

A main turbine control failure results in a rapid load reduction. The RO stabilizes RCS pressure at 2300 psig by manually cracking open one spray valve. Pressure is held constant at 2300 psig for several minutes. The RO then observes that pressurizer level is 68%, PORV 455 is open, PORV 456 is shut, and the backup heaters are on.

Which ONE of the following correctly describes the status of the pressurizer pressure control system and required operator actions?

- A. The pressurizer pressure control system is functioning properly. Continue to lower pressure with pressurizer sprays.
- B. The pressurizer pressure control system is malfunctioning. Shut PORV Block Valve HV8000A.
- C. The pressurizer pressure control system is malfunctioning. Open PORV 456.
- D. The pressurizer pressure control system is malfunctioning. De-energize the backup heaters.

12.

The following Unit 1 conditions exist:

- Reactor is at 85% Rated Thermal Power
- PRZR PRESS CNTL SELECT Switch is selected to CH 455 / 456
- Pressurizer Auxiliary Spray Valve (HV-8145) has started leaking
- ALB12, Window D03, PRZR PRESS LO PORV BLOCK, annunciates

Which ONE of the following correctly describes the affect on charging flow and the pressurizer pressure control system?

- A. Charging flow rate initially increases. The demand on the Pressurizer Pressure Master Controller increases.
- B. Charging flow rate initially decreases. The demand on the Pressurizer Pressure Master Controller increases.
- C. Charging flow rate initially increases. The demand on the Pressurizer Pressure Master Controller decreases.
- D. Charging flow rate initially decreases. The demand on the Pressurizer Pressure Master Controller decreases.

13.

The following Unit 1 conditions exist:

- A Large Break LOCA and Loss of Offsite Power has occurred.
- The 'A' Diesel Generator failed to start.
- The crew has completed Cold Leg Recirc per 19013-C, Transfer to Cold Leg Recirculation, with the 'B' RHR Pump in operation.
- RCS temperature is 145 °F and stable.
- The CCW supply to the 'B' RHR Pump seal package has ruptured.

Which ONE of the following correctly states the actions required to mitigate the above conditions?

- A. The 'B' RHR pump must be secured to avoid seal damage. Use a steam generator to remove RCS heat.
- B. The 'B' RHR pump must be secured to avoid seal damage. Use safety injection pumps to remove RCS heat.
- C. The 'B' RHR pump must be secured to avoid seal damage. Use charging pumps to remove RCS heat.
- D. Continue to operate the 'B' RHR pump to remove RCS heat.

14.

The following Unit 1 conditions exist:

- Initial Reactor power was 51% Rated Thermal Power
- An Anticipated Transient Without Trip (ATWT) occurred (Turbine Trip without Reactor Trip)
- Tavg-Tref deviation is 20°F
- Crew has not yet manipulated any Steam Dump controls.
- The Balance of Plant operator reports that Steam Dump Banks 1, 2, 3 and 4 are fully open.

Which ONE of the following correctly describes the responses of the Steam Dump System with the current plant conditions?

- A. The steam dump system is operating properly.
- B. Banks 1, 2, and 3 should be full open. Bank 4 should be closed.
- C. Banks 1 and 2 should be full open. Bank 3 should be in a throttled position. Bank 4 should be closed.
- D. All 4 banks should be closed.

15.

Which ONE of the following correctly describes the power supply associated with the Unit 1 NSSS Protection Cabinet 2?

- A. Its normal power supply is 1NY2N and its alternate power supply is 1NYRS.
- B. Its normal power supply is 1NYRS and its alternate power supply is 1NY2N.
- C. Its normal power supply is 1BY1B, which supplies two 26v DC power supplies, that typically operate in a load sharing configuration for reliability purposes.
- D. Its normal power supply is 1BY1B, which supplies two 26v DC power supplies, each of which must be operating in order to supply 100% of the electrical demand from the cabinet.

16.

The Unit 1 operating crew is performing 19231-C, FR-H.1 Response to Loss of Secondary Heat Sink, due to a loss of all feedwater.

The following conditions exist:

- All Hot leg RTDs are indicating 560 °F.
- All steam generator (SG) levels are indicating 7% WR.
- Maintenance is working on restoring auxiliary feedwater (AFW) capability and are estimating that it will be available in 15 minutes.

Which ONE of the following correctly states the mitigation strategy that is directed by 19231-C?

- A. Immediately establish feed and bleed to lower RCS temperature, then attempt to establish AFW at 30 to 100 gpm to one SG until a WR SG level of greater than 9% is reached.
- B. Immediately establish feed and bleed to lower RCS temperature, then attempt to establish AFW at 30 to 100 gpm to all SGs until WR SG levels of greater than 9% are reached.
- C. Continue monitoring SG levels until they reach 0% WR, then establish feed and bleed to lower RCS temperature and attempt to establish AFW at 30 to 100 gpm to one SG until a WR SG level of greater than 9% is reached.
- D. Continue monitoring SG levels until they reach 0% WR, then establish feed and bleed to lower RCS temperature and attempt to establish AFW at 30 to 100 gpm to all SGs until WR SG levels of greater than 9% are reached.

17.

The following Unit 1 conditions exist:

- The unit is operating at 100% Rated Thermal Power.
- Bus 1AY1A is on its regulated transformer for maintenance activities to be performed.
- An earthquake occurs and causes the following simultaneous failures:
 - a double ended guillotine main steam line break in containment
 - containment pressure is 25 psig
 - a loss of offsite power
 - Bus 1BY1B is de-energized
- Both diesel generators start and load as designed.

Which ONE of the following correctly states the status of the containment spray system several minutes after the diesel generators finish their load sequence?

- A. Train "A" actuates, but Train "B" does not actuate.
- B. Train "B" actuates, but Train "A" does not actuate.
- C. Neither Train "A" or "B" actuate.
- D. Both Train "A" and "B" actuate.

18.

The RO withdraws control bank C rods to establish conditions for a dilution to criticality.

Prior to the rod withdrawal the following conditions existed:

DRPI: 42 Steps

Group 1 Step Counter: 42 Steps

Group 2 Step Counter: 41 Steps

After the rod withdrawal the following conditions exist:

DRPI: 42 Steps

Group 1 Step Counter: 56 Steps

Group 2 Step Counter: 55 Steps

Based on these indications, which ONE of the following correctly describes the state of the "Rod Dev" and "Rod Bank Lo-Lo-Limit" annunciators?

- A. The "Rod Dev" annunciator alarms and the "Rod Bank Lo-Lo-Limit" annunciator clears.
- B. The "Rod Dev" annunciator alarms and the "Rod Bank Lo-Lo-Limit" annunciator remains illuminated.
- C. The "Rod Dev" annunciator does not alarm and the "Rod Bank Lo-Lo-Limit" annunciator remains illuminated.
- D. The "Rod Dev" annunciator does not alarm and the "Rod Bank Lo-Lo-Limit" annunciator clears.

19.

Unit 1 Operators were in the process of swapping to Main Feedwater Regulating Valves in accordance with 12004-C, Power Operation (Mode 1), when the following alarms annunciated:

- ALB11-F06, UNDERFREQUENCY RCP BUS ALERT
- ALB11-E06, UNDERVOLTAGE RCP BUS ALERT

Subsequently Operators note that Bus 1NAA was de-energized.

Which ONE of the following correctly states the status of the RCPs?

- A. Only #1 and #2 RCPs trip.
- B. Only #1 and #3 RCPs trip.
- C. Only #2 and #4 RCPs trip.
- D. All RCPs trip.

20.

Given the following Unit 2 conditions:

- A small break loss of coolant accident has occurred
- All reactor coolant pumps have been tripped
- Natural circulation is believed to be established

Core Exit Thermocouples (CETC) system readouts have failed.

- Pressurizer pressure channel PT-455 indicates 1725 psig
- Pressurizer pressure channel PT-457 indicates 1735 psig
- RCS pressure PT-408 and 418 indicate 1690 psig
- RCS pressure PT-428 and 438 indicate 1685 psig

RCS Hot and Cold Leg Wide Range Temperatures indicate as follows:

	Loop 1	Loop 2	Loop 3	Loop 4
Thot	540	550	560	555
Tcold	533	543	553	550

Which ONE of the following temperature values (in degrees F) will be the correct amount of subcooling when using RTDs?

- A. 53
- B. 56
- C. 57
- D. 60

21.

All containment cooling fan controls are in their normal at power configuration.

Which ONE of the following correctly describes the response of the Train "A" containment fan coolers following a loss of offsite power with an "A" Train safety injection present?

(assume sequencer starts at 0 seconds)

- A. At 30.5 seconds 2 fans start in high speed and at 50.5 seconds 2 fans start in high speed.
- B. At 30.5 seconds 2 fans start in low speed and at 50.5 seconds 2 fans start in low speed.
- C. At 30.5 seconds 4 fans start in high speed.
- D. At 30.5 seconds 4 fans start in low speed.

22.

Which ONE of the following groups of components are ALL designed to be directly cooled by the Nuclear Service Cooling Water System?

- A. AFW pump motor cooler, CCW heat exchangers, EDG jacket water cooler, containment auxiliary cooler.
- B. Spent fuel cooling pump motor cooler, ACCW heat exchangers, seismic fire hose stations, CCW pump motor cooler.
- C. Control building ESF chillers, containment coolers, RHR pump motor cooler, piping area penetration cooler.
- D. Containment spray pump motor cooler, SI pump oil cooler and motor cooler, Charging pump oil and motor cooler, EDG lube oil heat exchanger.

23.

Which ONE of the following correctly describes an emergency boration flow path option through the regenerative heat exchanger in accordance with 13009-1, CVCS Reactor Makeup Control System?

- A. Emergency boration through 1-HV-8104, Emergency Borate Valve, by:
- starting a Boric Acid Transfer Pump
 - ensuring a Charging Pump is running
 - opening 1-HV-8104, and
 - placing 1-FIC-0121 in manual and adjusting flow to 30 gpm.
- B. Emergency boration through the normal charging path by:
- starting a Boric Acid Transfer Pump
 - ensuring a Charging Pump is running
 - opening 1-FV-0110A, BA to BA Blender
 - opening 1-FV-0110B, Blender Outlet to Charging Pump Suction
 - placing 1-FIC-0121 in manual and adjusting flow to 30 gpm.
- C. Emergency boration from the RWST by:
- ensuring one Charging Pump is running and supplied with cooling water
 - opening 1-LV-0112D and E, Charging Pump Suctions from the RWST
 - closing 1-LV-0112B and C, VCT Outlet Isolations
 - placing 1-LV-0112A to the HUT position
 - placing 1-FIC-0121 in manual and adjust charging flow to greater than 100 gpm
 - adjusting 1-HV-0182, Charging Seal Flow Control, to maintain RCP seal injection flow at approximately 40 gpm (8 - 13 gpm per pump).
- D. Emergency boration from the RWST by:
- ensuring one Charging Pump is running and supplied with cooling water
 - opening 1-LV-0112D and E, Charging Pump Suctions from the RWST
 - closing 1-LV-0112B and C, VCT Outlet Isolations
 - placing 1-LV-0112A to the HUT position
 - opening 1-HV-8801A and B, BIT discharge isolations
 - ensuring 1-FI-0917A, BIT flow, plus total seal injection flow, less total seal return flow is greater than 87.5 gpm.

24.

The following conditions exist on Unit 1:

- The plant is 37 days and 12 hours into a refueling outage.
- The unit is in Mode 5 at mid-loop conditions.
- RHR 1A heat exchanger inlet temperature is stable at 100 °F.
- Due to outage complications, core offload has not yet commenced.
- Subsequently the 1A RHR Pump trips.
- The crew enters 18019-C, Loss of Residual Heat Removal and are preparing to calculate the time to boil.

Which ONE of the following is correct if the loss of RHR continues without mitigation?
(References provided)

- A. The time to boiling is less than 50 minutes. Promptly initiate actions to protect personnel inside containment and establish containment closure.
- B. The time to boiling is more than 60 minutes. Promptly initiate actions to protect personnel inside containment and establish containment closure.
- C. The time to boiling is less than 50 minutes. Promptly align SI pumps for Hot Leg Injection and establish Charging flow needed to maintain RCS level.
- D. The time to boiling is more than 60 minutes. Promptly align SI pumps for Hot Leg Injection and establish Charging flow needed to maintain RCS level.

25.

The following Unit 1 conditions exist:

- Unit is in Mode 3.
- CCW Pumps 2 and 6 are running.
- CCW Pump 4 is in Pull-To-Lock.
- All other CCW Pumps are in their normal configuration.

A loss of offsite power occurs coincident with a Low Steam Line Safety Injection. Both emergency diesel generators start and energize their respective busses.

Which ONE of the following is the correct CCW system response and the reason for the response?

- A. Pumps 1, 2, and 3 start at 20.5 seconds and Pumps 5 and 6 start at 25.5 seconds due to the Pump 4 breaker not closing.
- B. Pumps 1, 2, and 3 start at 20.5 seconds and Pumps 5 and 6 start at 25.5 seconds due to Pump 4 low discharge pressure.
- C. Pumps 1, 2, and 3 start at 20.5 seconds and Pump 6 starts at 25.5 seconds due to the Pump 4 breaker not closing (Pump 5 does not start).
- D. Pumps 1, 2, and 3 start at 20.5 seconds and Pump 6 starts at 25.5 seconds due to Pump 4 low discharge pressure (Pump 5 does not start).

26.

Which ONE of the following design features prevents radioactivity from escaping containment when the RWST EMPTY LEVEL alarm annunciates?

- A. Check valve located on the RWST suction line to the containment spray pumps.
- B. Interlock on the containment emergency sump suction valve to the containment spray pump.
- C. Automatic closure of the containment spray pump minimum flow valves that discharge to the RWST.
- D. CCP swap to RWST on VCT low level is automatically blocked.

27.

A Unit 2 RCS cooldown is in progress at 50 °F/hr in accordance with 19002-C, ES-0.2 Natural Circulation Cooldown.

Which ONE of the following describes the reason for maintaining temperature and pressure within the limits of Technical Specification LCO 3.4.3 (PTLR)?

- A. To prevent DNB limits from being exceeded.
- B. To maintain RCS pressure at an acceptable value to allow a restart of an RCP.
- C. To maintain the RCS at a temperature and pressure to prevent a safety injection.
- D. To maintain the RCS temperature and pressure within limits to prevent upper head voiding.

28.

The following Unit 1 conditions exist:

- The reactor is stable at the point-of-adding-heat.
- Reactor Physics testing is in progress.
- Power Range Channel N-44 is in trip with the reactivity recorder installed.
- A fault occurs that results in a loss of Bus 1AY1A.

Which ONE of the following describes the effect on the source range indications and the reason for the indications?

- A. Source Range Channels N-31 and N-32 will remain energized and their indications will remain stable.
- B. Source Range Channels N-31 and N-32 will remain energized and their indications will decrease.
- C. Source Range Channel N-31 will de-energize and N-32 indication will remain stable.
- D. Source Range Channel N-31 will de-energize and N-32 indication will decrease.

29.

Operators are performing refueling operations for Unit 2. The following conditions exist:

- Operators have a fuel assembly attached to the mast of the refueling machine suspended about 4 feet from the bottom of the core.
- HOIST LOAD OVERLOAD LIGHT is illuminated red

Which ONE of the following correctly describes what physically must occur in order to get the refueling machine to continue to pull the assembly in the upward direction (Assume the Fuel Handling Supervisor has given you permission)?

- A. Place the HOIST JOYSTICK in the UP position. No other actions are required.
- B. Place the HOIST JOYSTICK in the UP position while pushing the HOIST LOAD BYPASS PUSHBUTTON.
- C. Select "MANUAL" operational mode followed by placing the HOIST JOYSTICK in the UP position.
- D. Select and hold "OVERRIDE" on the INTERLOCK OVERRIDE KEY SWITCH while placing the HOIST JOYSTICK in the UP position.

30.

Unit 1 refueling was in progress when a new fuel assembly was dropped in the reactor core and came to rest in close proximity to a previously irradiated fuel assembly. The control room staff noted a small increase in count rate and plotted the next point on the inverse count rate ratio ($1/M$) plot.

Which ONE of the following correctly describes the reactivity implications of the above conditions?

- A. The $1/M$ plot will trend in the downward direction. There is little risk of creating a critical configuration because the pre-event boron concentration must be such that K_{eff} is maintained less than 0.95.
- B. The $1/M$ plot will trend in the downward direction. Emergency boration would be required to prevent a loss of shutdown margin (SDM).
- C. The $1/M$ plot will trend in the upward direction. There is little risk of creating a critical configuration because the pre-event boron concentration must be such that K_{eff} is maintained less than 0.95.
- D. The $1/M$ plot will trend in the upward direction. Emergency boration would be required to prevent a loss of shutdown margin (SDM).

31.

Unit 2 is shutting down from 100% Rated Thermal Power in response to a steam generator tube leak per AOP 18009-C, Steam Generator Tube Leak.

Which ONE of the following correctly states the trend of the estimated leak rate during the shutdown and the reason for the trend? (Assume that the geometric size of the flaw remains constant)

- A. Estimated leak rate would decrease because the primary to secondary pressure difference is reduced as power is lowered.
- B. Estimated leak rate would decrease because the air ejector flow rate would decrease as power is lowered.
- C. Estimated leak rate would remain the same because the monitored isotopes analyzed are independent of power level.
- D. Estimated leak rate would increase because of the iodine spiking associated with the shutdown.

32.

The following Unit 1 conditions exist:

- A steam generator tube rupture has occurred and the control room crew has proceeded to the point in 19030-C, E-3 Steam Generator Tube Rupture, where they are evaluating conditions for restart of a reactor coolant pump.
- Containment pressure is 1 psig.
- Containment temperature is 100 °F.

Which ONE of the following correctly describes a set of conditions that would NOT prevent restart of a reactor coolant pump?

- A. RCP seal number 1 temperatures are 195 °F. Seal injection flow and ACCW cooling to the thermal barrier was lost for 15 minutes.
- B. RCP seal number 1 dP is 210 psi and pressurizer level is 95%.
- C. RCP seal number 1 temperatures are 225 °F. Seal injection flow and ACCW cooling to the thermal barrier was lost for 15 minutes.
- D. RCP seal number 1 dP is 220 psi and #1 seal leakoff flow is 5.8 gpm.

33.

The following Unit 1 conditions exist:

- The reactor is at 90% Rated Thermal Power
- Rod control is in automatic with CBD at 196 steps
- All control systems are in their normal alignment
- Turbine load decreases to 850 MWe in 30 seconds
- PT-506 (turbine impulse pressure) sticks at 90%

Which ONE of the following is the correct response to this transient?

- A. The steam dump Tave controller generates a demand signal, but the steam dumps remain shut.
- B. The steam dump Tave controller generates a demand signal and Bank 1 opens.
- C. The steam dump Tave controller generates a demand signal and Banks 1 and 2 open.
- D. The steam dump Tave controller generates a demand signal and Banks 1, 2 and 3 open.

34.

The following Unit 2 conditions exist after taking critical data during a reactor startup:

- Core Cycle Burnup = 15000 MWd/MTU
- Reactor Power is $2 \times 10^{-3}\%$
- RCS Temperature is being controlled at 557°F using steam dumps in their normal configuration
- A contact fails open in the steam pressure portion of the arming circuit for the steam dumps

Which ONE of the following correctly describes the effect on RCS temperature and reactivity?

- A. RCS temperature increases. Positive reactivity is added to the reactor.
- B. RCS temperature increases. Negative reactivity is added to the reactor.
- C. RCS temperature decreases. Positive reactivity is added to the reactor.
- D. RCS temperature decreases. Negative reactivity is added to the reactor.

35.

Unit 1 is at 100% rated thermal power with ALB10-B06, ROD CONTROL URGENT FAILURE, in alarm. Control Rods are in automatic mode. The turbine governor valves close unexpectedly resulting in a 10% load rejection over a 90 second period.

Which ONE of the following correctly describes how RCS temperature is controlled given the above conditions?

- A. RCS temperature will go down due to higher xenon concentration with no rod motion and no steam dump operation.
- B. RCS temperature will be controlled entirely by control rods because the power change is not enough to require steam dump operation.
- C. RCS temperature will be controlled entirely by steam dumps because the control rods will not move.
- D. RCS temperature will be controlled with a combination of control rods and steam dumps because the load rejection occurs quickly.

36.

A secondary plant transient has occurred on Unit 1 resulting in the following plant conditions:

- Reactor and turbine power = 103%
- Both main feedwater pumps have tripped
- All steam generator levels are in the program band, but lowering rapidly
- Main feedwater flow indicators are at the bottom of the scale

Which ONE of the following correctly describes the initial automatic plant response to these conditions? (Reference Provided)

- A. Turbine trips immediately, which then causes the reactor to trip.
- B. Turbine trips immediately and the reactor trips on Lo-Lo Steam Generator Level.
- C. Turbine trips after a short time delay (less than a minute), which then causes the reactor to trip.
- D. Turbine trips after a short time delay (less than a minute) and the reactor trips on Lo-Lo Steam Generator Level.

37.

Unit 1 has the following indications:

- Plant is at end of life with 111 ppm boron in the RCS.
- Reactor power is at 100% Rated Thermal Power and approximately stable.
- Turbine load is 1200 MWe and approximately stable.
- Steam pressure is 970 psig and stable.
- #1 Steam Generator level is slowly trending down.
- ALB13-B01, STM GEN 1 FLOW MISMATCH, is illuminated.
- Containment pressure is 1 psig and slowly increasing.
- Containment radiation levels are normal.
- Main Feedwater Pump discharge pressure has started to drop.

Which ONE of the following correctly completes the statement regarding the plant response and reason for the response?

The #1 main feed regulating valve will INITIALLY modulate...

- A. open to try to maintain steam generator level as main feedwater pump speed increases.
- B. closed to try to maintain steam generator level by matching feed flow with steam flow.
- C. open to try to maintain steam generator level by matching feed flow with steam flow.
- D. closed to try to raise main feedwater pump discharge pressure.

38. The crew is performing 19101-C, ECA-0.1 Loss of All AC Power Recovery Without SI Required, and are attempting to verify natural circulation with the following conditions:

- Offsite power is not available
- Both emergency diesel generators are supplying their loads
- RCS subcooling is 22 °F
- Steam generator levels and pressures are stable
- Core exit thermocouples are stable
- RCS WR cold legs are at saturation temperatures for the steam generator pressures

Which ONE of the following describes the correct operator actions based on the above conditions?

- A. Open the steam dumps to lower steam generator pressures and cool the RCS.
- B. Open the steam generator ARVs to lower steam generator pressures and cool the RCS.
- C. Throttle closed the steam dumps to maintain the same steam generator pressures and conserve secondary inventory.
- D. Throttle closed ARVs to maintain the same steam generator pressures and conserve secondary inventory.

39.

During performance of 19100, ECA-0.0 Loss of All AC Power, operators encounter steps that have them open several electrical equipment room doors within 30 minutes of losing AC power (Step 15) and to depressurize the steam generators to 300 psig, but not less than 200 psig (Step 18).

Which ONE of the following correctly states the reasons (basis) for these two steps?

- A. If electrical equipment room doors are not opened within the time limit (30 minutes) a loss of control power could occur AND the steam generators must not be depressurized to less than 200 psig to prevent a steam bubble in the reactor vessel head.
- B. If electrical equipment room doors are not opened within the time limit (30 minutes) a loss of control power could occur AND the steam generators must not be depressurized to less than 200 psig to prevent injecting nitrogen from the accumulators.
- C. If electrical equipment room doors are not opened within the time limit (30 minutes) permanent damage to the station batteries due to reverse polarity may occur AND the steam generators must not be depressurized to less than 200 psig to prevent a steam bubble in the reactor vessel head.
- D. If electrical equipment room doors are not opened within the time limit (30 minutes) permanent damage to the station batteries due to reverse polarity may occur AND the steam generators must not be depressurized to less than 200 psig to prevent injecting nitrogen from the accumulators.

40.

The following Unit 1 conditions exists:

- The plant is in its normal configuration.
- PRZR level control is selected to 459/460
- PRZR pressure control is selected to 455/456
- 1AY1A, 120V AC Vital Instrument Distribution Panel, de-energizes due to a fault.
- CCP-1B is running and charging flow raises to 150 gpm.

Which ONE of the following correctly describes the response of the Centrifugal Charging Pumps (CCP) suction supply valves from the VCT and RWST over the next 15 minutes (assume no operator action)?

- A. LV-0112E (RWST to CCPs) opens and LV-0112C (VCT to CCPs & NCPs) closes. LV-0112D (RWST to CCPs) and LV-0112B (VCT to CCPs & NCPs) will not reposition.
- B. LV-0112D (RWST to CCPs) opens and LV-0112B (VCT to CCPs & NCPs) closes. LV-0112E (RWST to CCPs) and LV-0112C (VCT to CCPs & NCPs) will not reposition.
- C. LV-0112D and E (RWST to CCPs) open and LV-0112B and C (VCT to CCPs & NCPs) close.
- D. LV-0112D and E (RWST to CCPs) and LV-0112B and C (VCT to CCPs & NCPs) will not reposition.

41.

Unit 1 has the following conditions:

- Unit is at 100% power
- Diesel Generator '1A' is paralleled with its safety bus for surveillance
- Pressurizer pressure control is selected to 455/456
- Pressurizer level control is selected to 459/460

The crew notes that the following Main Control Room annunciators are received followed by an automatic reactor trip.

- 125V DC SWGR 1AD1 TROUBLE
- 125V DC MCC 1AD1M TROUBLE
- 125V DC PNL 1AD12 TROUBLE
- 120V AC PANELS 1AY1A 1AY2A TROUBLE
- INVERTERS 1AD111 1AD1111 TROUBLE
- 125V DC PNL 1AD11 TROUBLE

Which ONE of the following correctly describes the plant response?

- A. The reactor trips on Pressurizer High Pressure.
Diesel Generator 1A output breaker opens.
- B. The reactor trips on Pressurizer High Pressure.
Diesel Generator 1A output breaker remains closed.
- C. The reactor trips on OT-delta-T.
Diesel Generator 1A output breaker opens.
- D. The reactor trips on OT-delta-T.
Diesel Generator 1A output breaker remains closed.

42.

If Train 'B' Reactor Trip Breaker fails to open on a reactor trip, which ONE of the following correctly states the effect this will have on the Low Tavg/P-4 Feedwater Isolation Signal as RCS temperature decreases?

- A. No FWI signal will be generated when RCS temperature lowers to 564 °F.
- B. Only Train A FWI signal will be generated and only two Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.
- C. Both Train A and Train B FWI signals will be generated and all four Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.
- D. Only Train A FWI signal will be generated and all four Main Feedwater Isolation Valves will close when RCS temperature lowers to 564 °F.

43.

Given the following Unit 1 conditions:

- Control rods are in manual
- Reactor Power is at 50% Rated Thermal Power with all secondary control systems in automatic.
- FT-512 (#1 SG Controlling Steam Flow) is selected and fails high.

Which ONE of the following correctly describes the effects of the failure assuming no operator action?

- A. Initially #1 FRV opens and #1 SG level rises rapidly. Main Feedwater Pump speed increases.
- B. Initially #1 FRV opens and #1 SG level rises rapidly. Main Feedwater Pump speed decreases.
- C. Initially #1 FRV closes and #1 SG level lowers rapidly. Main Feedwater Pump speed increases.
- D. Initially #1 FRV closes and #1 SG level lowers rapidly. Main Feedwater Pump speed decreases.

44.

The following Unit 1 conditions exist:

- The reactor has tripped
- E-0, Reactor Trip or Safety Injection, is being performed (Operators are at Step 19, verifying adequate AFW flow)
- Containment radiation levels are 2×10^5 Rad/hr
- Containment pressure is 3.0 psig
- The "A" motor driven AFW pump is tagged out for maintenance
- The "B" motor driven AFW pump is operating with its discharge valves full open
- The turbine driven AFW pump failed to automatically start and operators have not yet attempted a manual start
- All steam generator narrow range levels are 29% NR and slowly going down
- Total AFW flow is 550 gpm

Which ONE of the following correctly states the RO's required procedural action to address the above secondary heat removal issues?

- A. Trip all RCPs.
- B. Start the TDAFW pump.
- C. Start the TDAFW pump when SG levels reach 10% NR.
- D. Commence RCS feed and bleed.

45.

The following conditions were noted during the last Emergency Diesel Generator (EDG) test run:

- The EDG was loaded at a rate of 200 kW/min
- The maximum load attained was 7000 kW
- The maximum reactive loading was 1000 kVars negative (in)
- The output voltage was stable at 4090 Vac

Which ONE of the following was in violation of the EDG limitations?

- A. Load rate (kW/min)
- B. Load (kW)
- C. Reactive load (kVar)
- D. Output voltage (Vac)

46.

The following conditions exist on Unit 1:

- A small break LOCA has occurred
- Safety Injection has just been reset
- CCW pump 1 has just undergone a complete shear of its shaft

Which ONE of the following, assuming no operator action, correctly describes the status of the plant loads one minute after the Diesel Generator Output Breakers close following a complete loss of offsite power?

- A. ACCW Pump 1 is running AND CCW Pumps 1, 3, and 5 are running.
- B. ACCW Pump 1 is running AND CCW Pumps 1 and 3 are running with CCW Pump 5 not running.
- C. RHR Pump A is running AND CCW Pumps 1, 3, and 5 are running.
- D. RHR Pump A is running AND CCW Pumps 1 and 3 are running with CCW Pump 5 not running.

47.

The following Unit 1 conditions exist:

- 18021-C, Loss of Nuclear Service Cooling Water System, has been entered and operators are at the point in the procedure where they are going to place one train of Nuclear Service Cooling Water in service in single pump operation.
- The pump that is going to be started previously tripped on a spurious overcurrent.

Which ONE of the following correctly describes precautions and limitations for starting the nuclear service cooling water pump and placing loads in service under these conditions?

- A. The electrical lockout relay for the pump to be started must be reset prior to pump start. Following pump start, system flow is adjusted to prevent pump runout.
- B. The electrical lockout relay for the pump to be started does not need to be reset prior to pump start. Following pump start, system flow is adjusted to prevent pump runout.
- C. The electrical lockout relay for the pump to be started must be reset prior to pump start. Following pump start, the supply header pressure is restricted to prevent overpressure condition in the discharge piping.
- D. The electrical lockout relay for the pump to be started does not need to be reset prior to pump start. Following pump start, the supply header pressure is restricted to prevent overpressure condition in the discharge piping.

48.

The following Unit 1 conditions exist:

- Reactor startup is in progress
- Reactor power has stabilized at $2 \times 10^{-3}\%$ Intermediate Range
- Intermediate Range channel N-35 was declared inoperable and removed from service

Which ONE of the following describes the plant response if an I&C Technician mistakenly removes control power fuses for N-35 instead of instrument power fuses while performing AOP-18002-C, "Nuclear Instrumentation System Malfunction"?

- A. The source range detectors, N-31 and N-32, are automatically reinstated because the P-6 permissive clears.
- B. The reactor trip breakers indicate closed because the trip signal was blocked by the P-6 permissive.
- C. The bistables for reactor trip and rod withdrawal block de-energize, however reactor trip breakers indicate closed.
- D. The level trip bypass is lost and the reactor trip breakers indicate open.

49.

Which ONE of the following correctly describes required actions of Technical Specification LCO 3.8.1 (AC Sources - Operating; Modes 1, 2, 3, and 4) Action Statement B (One DG Inoperable)?

- A. Suspend fuel movements in the Spent Fuel Pool immediately and verify SAT available within 1 hour.
- B. Verify correct breaker alignment for each required offsite source within 1 hour and verify SAT available within 1 hour.
- C. Initiate action to suspend the operations involving reactivity additions immediately and verify SAT available within 1 hour.
- D. Verify indicated power available for each required offsite circuit within 1 hour and suspend fuel movements in the Spent Fuel Pool immediately.

50.

Unit 1 has the following conditions:

- An inadvertent SI has occurred.
- The SI signal has not yet been reset.
- 1HV-9378, Instrument Air to Containment, is shut.

Which ONE of the following describes the reason for 1HV-9378 being shut and the actions required to restore instrument air to containment?

- A. 1HV-9378 went shut due to a CVI signal caused by the SIS. To open 1HV-9378, the SIS must be reset which will then allow the CVI to be reset allowing the valve to be reopened using the QMCB handswitch.
- B. 1HV-9378 went shut due to a CIA signal caused by the SIS. The SIS must be reset to allow CIA to be reset. After CIA is reset, 1HV-9378 can be opened from the QMCB.
- C. 1-HV-9378 went shut as a direct result of the SIS. The only way to open the valve is to locally open the valve using the handwheel OR reset SI and then open 1HV-9378 from the QMCB.
- D. 1HV-9378 went shut due to a CIA signal caused by the SIS. The CIA can be reset without resetting SI and then open 1HV-9378 from the main control board.

51.

Prior to liquid radwaste release, all associated equipment is verified to be operable and all normal sample and approval processes have been completed.

Waste Monitor Tank 009 is in the process of being released on Unit 1 when power to the DPM for RE-018 (Liquid Waste Monitor) is lost due to an error made by an electrician.

Which ONE of the following correctly explains the affect on the liquid radwaste release?

- A. Liquid Radwaste Isolation Valve RV-018 closes. RV-018 may be immediately re-opened to allow the release to continue.
- B. Liquid Radwaste Isolation Valve RV-018 closes. RV-018 may not be immediately re-opened to allow the release to continue.
- C. Liquid Radwaste Isolation Valve RV-018 remains open. Immediately close the valve from the control room to stop the release.
- D. Liquid Radwaste Isolation Valve RV-018 remains open. The valve can not be controlled from the control room, therefore, immediately instruct an operator in the field to close the valve to stop the release.

52.

Which ONE of the following will cause a CVI when reading full scale high?

- A. RE-2565A (Cnmt Vent)
- B. RE-004 (Cnmt Access Hatch)
- C. RE-2562A (Cnmt Atmos)
- D. RE-005 (Cnmt - High Range)

53.

The following conditions existed on Unit 1 prior to a simultaneous loss of offsite power (LOSP) and safety injection (SI):

- Unit operating at 100% rated thermal power
- Nuclear Service Cooling Water (NSCW) was in its normal configuration

Following the LOSP/SI, the electrical busses supplying the NSCW pumps energize from the Emergency Diesel Generators.

Which ONE of the following is correct with respect to restoration of NSCW?

- A. Due to the NSCW pump supply breakers remaining closed on the LOSP, the NSCW pumps immediately start and begin to deliver full flow upon energization of the respective electrical busses.
- B. The NSCW pumps immediately begin to deliver full flow after being started via the undervoltage load sequencer.
- C. The NSCW pumps begin to deliver full flow approximately 15 seconds after being started via the undervoltage load sequencer.
- D. The NSCW pumps begin to deliver full flow approximately 60 seconds after being started via the undervoltage load sequencer.

54.

A fuseable link in a Preaction Fire Protection system with supervisory air has developed a leak. A loss of supervisory air is occurring.

Which ONE of the following is the correct system response?

- A. The clapper valve will trip open making the system wet. Full sprinkler flow will not occur (except for leakage).
- B. The clapper valve will trip open and full sprinkler flow through the fuseable link occurs.
- C. An alarm will alert the control room operators of the problem. No sprinkler flow occurs and the system remains dry.
- D. An alarm will alert the control room operators of the problem. The leaking fuseable link will allow the system to become wet, but sprinkler flow will not occur.

55.

Unit 1 is at 100% Rated Thermal Power (RTP) and Unit 2 is at 25% RTP. Two instrument air compressors are available on Unit 1, one of which is the swing compressor.

Two instrument air compressors are running on Unit 2, with the third compressor unavailable. The following Unit 2 alarms annunciate while instrument air pressure continues to lower:

- INST AIR EQUIP LO PRESS
- SERVICE AIR LO PRESS

18028-C, Loss of Instrument Air, is being implemented.

Which ONE of the following correctly states the actions that should be performed by the operators?

- A. Open the cross tie valve to supply Unit 2 air header from Unit 1.
- B. Re-align the swing compressor from Unit 2 to Unit 1.
- C. Verify isolation of service air (PV-9375) for Unit 2 and trip the reactor.
- D. Trip the turbine and isolate service air (PV-9375) for Unit 2.

56.

The following sequence of events occurs:

- Both Units were operating at 100% power.
- Diesel Generator (DG) 1A is in an extended outage period and is unavailable
- Both Unit 1 Reserve Auxiliary Transformers (RAT) trip
- DG 1B starts and then trips on overspeed
- You receive a report that RAT 1A is on fire

Which ONE of the following correctly describes the automatic response of the fire detection and protection given the above sequence of events?

- A. The fire detection system will detect the fire. The diesel fire pump(s) will start, but the clapper valve(s) must be manually tripped.
- B. The fire detection system will not detect the fire. The diesel fire pump(s) must be manually started by pulling up the lever on the Primary Emergency Start Contactor.
- C. The fire detection system will not detect the fire. The diesel fire pump(s) must be manually started using the Alternate Emergency Start Contactor.
- D. The fire detection system will detect the fire. The diesel fire pump(s) will start and deliver water to RAT 1A without operator action.

57.

The RCDT is aligned to the auxiliary building for liquid processing. Which ONE of the following correctly describes how the discharge flowpath would be affected if a safety injection (SI) were to occur?

- A. Discharge operations will not be affected by the SI.
- B. The discharge header isolation valves receive a close signal directly from the SI.
- C. The SI signal will result in a containment isolation actuation (CIA), which will directly close the discharge header isolation valves.
- D. The SI signal causes a CIA that will result in a loss of instrument air to containment, which will cause the RCDT discharge header isolation valves to close.

58.

Which ONE of the following concerning reactivity manipulations meets station expectations per NMP-OS-001, Reactivity Management Program?

- A. When making a routine boration for temperature control at BOL conditions, the manipulation must be peer checked by another licensed operator. The SS does not need to approve the manipulation if it was covered in the pre-shift reactivity briefing.
- B. When making a routine dilution for temperature control, another licensed operator shall peer check the manipulation. The SS must approve the manipulation even if it was covered in the pre-shift reactivity briefing.
- C. When responding to a turbine runback the RO shall have a peer check from another licensed operator prior to inserting control rods to keep Tave matched with Tref. SS approval is not required for these conditions.
- D. When responding to a loss of feedwater heating at 100% power, the BOP shall get approval from the SS prior to lowering power. Peer check from another licensed operator is not required for these conditions.

59.

Which ONE of the following correctly states symptoms, as listed in the procedure, for entry into Section "A" of Loss of Class 1E 125 V DC Power, 18034-1, for loss of train "A" power?

- A. Loss of indicating lights on switchgear breakers for 1AA02, 1AB04, 1AB05, 1AB15. Loss of power to 1AY1A and 1AY2A. Train A Main Steam Line Isolation.
- B. Loss of indicating lights on equipment powered by Motor Control Centers (MCCs) 1ABA through 1ABF. Loss of power to 1AY1A and 1AY2A. Train A Main Steam Line Isolation.
- C. Loss of power to 1AY1A. TDAFW pump loss of control and indication. Emergency DG-1A fails to start. Train A Main Feed Line Isolation.
- D. Trip of the normal and alternate incoming breakers for switchgear 1AA02. Train A Main Feed Line Isolation. 125V DC Vital Bus 1AD1 voltage low. Train A Main Steam Line Isolation.

60.

The following Unit 1 conditions exist:

- Reactor is at 100% Rated Thermal Power.
- Loop 1 NR temperature loop failure has resulted in the OTDT trip setpoint to be 92%.
- Control rods have been placed in manual.
- The DELTA T DEFEAT SWITCH has been selected to defeat the failed channel.
- The Tavg DEFEAT SWITCH has been selected to defeat the failed channel.

If no other actions were taken, which ONE of the following correctly states the plant status and/or required operator actions?

- A. If another loop OTDT trip setpoint is subsequently exceeded, then the operators are to ensure the reactor automatically trips.
- B. Loop 1 has been removed from the OTDT protection circuit. Two more loops must exceed the OTDT setpoint for a reactor trip to occur.
- C. The turbine should have already undergone a runback. The BOP is required to manually runback the turbine.
- D. The reactor should have already tripped on OTDT. The RO is required to immediately trip the reactor.

61.

Which ONE of the following correctly states the proper method for positioning a fail open air operated valve (AOV), with a handwheel, to be used as a fluid boundary per NMP-AD-003, Equipment Clearance and Tagging, as part of the tagging process?

- A. Local and/or remote control switches must be in the "Closed" position. The air supply valve must be closed with air vented off of the operator. The handwheel must be in the closed position.
- B. Local and/or remote control switches must be in the "Closed" position. The air supply valve must be closed with air vented off of the valve operator. The handwheel does not need to be in the closed position.
- C. Local and/or remote control switches must be in the closed position. The handwheel must be in the closed position. The air supply is not required to be isolated and vented.
- D. Local and/or remote control switches must be in the "Closed" position. The valve must be mechanically or hydraulically (as appropriate) gagged in the closed position.

62.

Which ONE of the following maintenance activities, if conducted, would result in entry into a technical specification LCO action statement (assume each case separately and that all other equipment is operable and in its normal configuration for the stated plant conditions)?

- A. RCS temperature is 425 °F and Maintenance wants to replace the Train "A" Containment Spray Pump bearing.
- B. The unit is at 100% rated thermal power and steam generator #2 ARV needs to be repaired to stop seat leakage.
- C. The unit is at 100% rated thermal power and Maintenance needs you to de-energize the Standby Auxiliary Transformer (SAT) for inspection of electrical bushings.
- D. RCS temperature is 190 °F and CCP-1A motor bearing needs replacement.

63.

During refueling activities the duties and responsibilities of the Reactor Operator, in accordance with 93300-C, Conduct of Refueling Operations, include all of the following EXCEPT:

- A. Shall be stationed in the control room during all fuel movement, and during control rod latching and unlatching.
- B. Directs disengagement of fuel assemblies in the core after determining stable count rate on nuclear instrumentation.
- C. Monitors nuclear instrumentation during control rod latching and unlatching activities.
- D. Initiates cavity water level surveillance whenever the reactor cavity is flooded.

64.

An operator began work at Vogtle in May 2004. The current date is May 2005. The operator has the following dose history (TEDE):

- Year 2004 = 3000 mrem
- Year 2005 = 1427 mrem (Accumulated through May 2005)

The worker is directed to perform a job with an estimated dose of 1156 mrem.

Which ONE of the following correctly states the required approval, if any, needed prior to beginning the work?

- A. Vice President
- B. HP/C Manager
- C. NRC
- D. No approval needed

65.

The #1 Gas Decay Tank on Unit 2 is being released in accordance with 13202-2, Gaseous Releases. After the release has been underway for 10 minutes, Flow Transmitter, A-FT-0014, fails low. Which ONE of the following correctly states the actions that are required by 13202-2?

- A. The release does not need to be terminated unless Waste Gas Processing System Effluent Monitor, A-RE-0014, becomes inoperable or its setpoint is exceeded.
- B. The release must be terminated. It may not be recommenced until A-FT-0014 is repaired.
- C. The release does not need to be terminated. It may continue provided release rates are manually calculated.
- D. The release must be terminated. It may be recommenced provided release rates are manually calculated.

66.

19000-C, E-0 Reactor Trip or Safety Injection, has been entered upon a reactor trip.

Which ONE of the following correctly describes the required operator response with respect to performance of immediate operator actions following the reactor trip?

- A. The USS is required to state the entire step, including all substeps. The RO and BOP are required to repeat only the high level step.
- B. The USS is required to state the entire step, including all substeps. The RO and BOP are required to repeat the entire step, including all substeps.
- C. The USS is required to state the high level step. The RO and BOP are required to repeat the step, including all substeps.
- D. The RO and BOP are required to repeat only the high level step and be able to perform all substeps.

67.

Unit 1 was at 100% rated thermal power with the following conditions:

- Chemistry confirmed a 7 gpd tube leak in Steam Generator #1.
- RE-12839C, SJAЕ Rad Monitor, alarm setpoint was adjusted.
- RE-0724, Main Steam N16 Monitor, was reading above background.
- Steam Generator #1 steam supply to the TDAFW Pump was isolated.
- 18009-C, Steam Generator Tube Leak, was entered, and remains in effect.
- Steam Generator #2 pressures are 800 psig and dropping rapidly.
- Containment pressure is 8 psig and rising rapidly.
- Containment sump levels are trending up.
- RCS subcooling is trending up.

The control room crew then enters 19000-C, E-0 Reactor Trip or Safety Injection, due to an automatic reactor trip and safety injection.

Which ONE of the following correctly describes the correct course of action?

- A. Transition from 19000-C to 19020-C, E-2 Faulted Steam Generator Isolation.
- B. Transition from 19000-C to 19030-C, E-3 Steam Generator Tube Rupture.
- C. Transition from 19000-C to 19010-C, E-1 Loss of Reactor or Secondary Coolant.
- D. Transition from 19000-C to 18004-C, Reactor Coolant System Leakage.

68.

The SRO announces to the crew that 19005-C, Rediagnosis, must be entered.

Which ONE of the following conditions would require the RO to dispute this course of action (I.E. prevent entry into 19005-C)?

- A. Total ECCS flow is 2000 gpm.
- B. 19030-C, Steam Generator Tube Rupture, is in progress.
- C. Following a safety injection, a yellow path on "Inventory" is present at Step 1 of 19010-C, Loss of Reactor or Secondary Coolant, but the procedure reader has decided not to implement the FRP at this time.
- D. 19001-C, Reactor Trip Response, is in progress with pressurizer level at 20% and stable and RCS subcooling at 40 °F and stable.

69.

The following Unit 1 conditions exist:

- A Small Break LOCA has occurred
- A reactor trip and SI has occurred.
- Operators have entered 19012-C "Post-LOCA Cooldown and Depressurization."
- Cooldown to cold shutdown has commenced but depressurization to refill the pressurizer has not started.
- At Step 11 the operators are directed to "Check RCS subcooling based on CETCs greater than 24°F (38°F)."

Which ONE of the following describes the reason subcooling is checked to be above this value?

- A. To determine if RCPs must be stopped
- B. To determine if RCS depressurization can commence.
- C. To allow normal charging to be aligned
- D. To allow the SI signal to be reset

70.

Which ONE of the following correctly states actions contained in 19112-C, ECA-1.2 LOCA Outside Containment, and reasons for those actions?

- A. Open HV-8802A (SI PMP-A TO HOT LEG 1 & 4 ISO VLV) to provide a flow path for Low Head Safety Injection. Then close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV) and monitor RCS pressure.
- B. Close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV). If this action does not result in an RCS pressure rise then allow the valve to remain closed because this will allow time for the operators to check Auxiliary Building alarms while the flow path is isolated.
- C. If the leak is not identified and isolated then transition to 19010-C, Loss of Reactor or Secondary Coolant, because RCS inventory will continue to be lost outside of containment.
- D. Close HV-8809A (RHR PMP-A TO COLD LEG 1 & 2 ISO VLV). If this action results in an RCS pressure rise then stop the 'A' RHR Pump.

71.

A depressurization of all steam generators is occurring and 19121-C, ECA-2.1 Uncontrolled Depressurization of All Steam Generators, has just been entered. The turbine driven auxiliary feedwater pump (TDAFWP) is the only source of feedwater available to feed the steam generators.

Per the CAUTION statements of 19121-C, which ONE of the following meets the required actions associated with the TDAFW Pump?

- A. Shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) and HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1).
- B. Shut HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1) and maintain 30 gpm of auxiliary feed flow to each steam generator.
- C. Do not shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) or HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1), and maintain 60 gpm of auxiliary feed flow to only one steam generator.
- D. Do not shut HV-3009 (LP-1 MS SPLY TO AUX FW TD PMP-1) or HV-3019 (LP-2 MS SPLY TO AUX FW TD PMP-1) and maintain 60 gpm of auxiliary feed flow to each steam generator.

72.

Unit 1 has just tripped and operators are performing E-0, Reactor Trip or Safety Injection, Step 21, "VERIFY RCS temperatures," with the following conditions.

- RCS cold leg temperatures are 560 °F and rising
- Condenser vacuum is 27.00 inches of Hg and lowering
- Power supply 1AY1A is de-energized
- Busses 1NAA and 1NAB are de-energized

Which ONE of the following correctly states the required operator action?

- A. With steam dumps in steam pressure mode, turn the PIC-507 potentiometer counter-clockwise.
- B. With steam dumps in steam pressure mode, turn the PIC-507 potentiometer clockwise.
- C. With SG #1 (PV-3000A) and SG #4 (PV-3030A) in manual mode, depress the manual up arrow to dump steam.
- D. With SG #2 (PV-3010A) and SG #3 (PV-3020A) in manual mode, depress the manual up arrow to dump steam.

73.

The following Unit 1 conditions exist:

- A primary LOCA outside containment is in progress
- The reactor was tripped and Safety Injection was manually actuated
- 19112-C, ECA-1.2 LOCA Outside Containment, has been completed
- The crew was unable to isolate the leak and they have transitioned to 19111-C, ECA-1.1 Loss of Emergency Coolant Recirculation.

Which ONE of the following choices describes the correct actions to take in 19111-C under these conditions?

- A. Start makeup to the RWST from the boric acid system, shift Containment Cooling Units to fast speed, and initiate RCS cooldown.
- B. Initiate RCS cooldown, establish one train of ECCS flow to maintain subcooling greater than 74 °F, and start makeup to the RWST from the Spent Fuel Pool.
- C. Initiate RCS cooldown, establish one train of ECCS flow to maintain subcooling greater than 74 °F, and start makeup to the RWST from the boric acid system.
- D. Start makeup to the RWST from the Spent Fuel Pool, initiate RCS cooldown, and minimize ECCS flow to keep RVLIS full range > 62%.

74.

Operators have entered 19121-C, ECA-2.1 Uncontrolled Depressurization of All Steam Generators, for Unit 2. While checking steam generator pressure boundaries, the reactor operator noted that Main Feed Isolation Valves (MFIVs) were not closed and could not be closed from the Main Control Room. Main Steam Isolation Valves and Main Feed Regulating Valves were verified to be shut.

Which ONE of the following correctly describes the mitigating actions in accordance with ECA-2.1 that are required to be taken by the operators faced with the open Main Feed Isolation Valves?

- A. Dispatch an operator to take local control of the MFIVs and stroke them shut.
- B. Dispatch an operator to momentarily open breakers 2AD12-08 and 2BD12-08.
- C. Dispatch an operator to locally isolate the air supply to the hydraulic pump on the MFIVs.
- D. Allow the valves to remain open because the Main Feed Regulating Valves and Main Feed Regulating Bypass Valves are closed.

75.

Which ONE of the following correctly describes the automatic actions that occur with respect to a Containment Ventilation Isolation (CVI) signal resulting from a high radiation condition in containment?

- A. Containment purge and containment atmosphere sample lines are isolated.
- B. Containment purge is isolated and electrical penetration area filtration and exhaust system receives a stop signal.
- C. Containment atmosphere sample lines are isolated and the piping penetration area filtration and exhaust system receives a stop signal.
- D. The electrical penetration area and the piping penetration area filtration and exhaust systems receive a stop signal.

VOGTLE RD INITIAL EXAM ANSWER KEY

2005-301

#	ID	Points	Answers
1	001K2.01 1	1.00	C
2	002G2.4.31 1	1.00	A
3	003K5.03 1	1.00	A
4	004A2.07 1	1.00	D
5	004K6.13 1	1.00	D
6	005A1.01 1	1.00	D
7	006A2.11 1	1.00	A
8	007A3.01 1	1.00	B
9	008A4.01 1	1.00	A
10	008AK3.05 1	1.00	A
11	009EA1.15 1	1.00	B
12	010K1.06 1	1.00	C
13	011EA2.07 1	1.00	D
14	012K1.07 1	1.00	A
15	012K2.01 1	1.00	C
16	013A1.04 1	1.00	A
17	013K3.03 1	1.00	A
18	014A1.03 1	1.00	A
19	015/017G2.4.10 1	1.00	D
20	017K3.01 1	1.00	A
21	022K2.01 1	1.00	D
22	022K4.01 1	1.00	C
23	024AK2.01 1	1.00	C
24	025AK1.01 1	1.00	A
25	026AK3.02 1	1.00	C
26	026K4.09 1	1.00	A
27	027AK3.03 1	1.00	D
28	032AK2.01 1	1.00	D
29	034K4.03 1	1.00	D
30	036AK1.02 1	1.00	A
31	037AK1.02 1	1.00	A
32	038EA2.17 1	1.00	B
33	039A4.07 1	1.00	A
34	039K5.08 1	1.00	B
35	041K6.03 1	1.00	C
36	045K1.18 1	1.00	A
37	054AK3.02 1	1.00	B
38	055EK1.02 1	1.00	B
39	056AK3.02 1	1.00	B
40	057AA1.04 1	1.00	C
41	058AA2.02 1	1.00	B
42	059A4.12 1	1.00	D
43	059K3.03 1	1.00	A
44	061A2.08 1	1.00	B
45	062A1.01 1	1.00	C
46	062A3.05 1	1.00	A
47	062G2.1.32 1	1.00	A

Answers

#	ID	Points	0
48	063A4.01 1	1.00	D
49	064G2.2.23 1	1.00	B
50	065AA1.03 1	1.00	D
51	068K6.10 1	1.00	B
52	073K1.01 1	1.00	A
53	076K2.08 1	1.00	D
54	078K1.01 1	1.00	C
55	079A2.01 1	1.00	C
56	086A3.02 1	1.00	D
57	103K4.06 1	1.00	C
58	G2.1.1 1	1.00	B
59	G2.1.23 1	1.00	A
60	G2.1.7 1	1.00	A
61	G2.2.13 1	1.00	C
62	G2.2.24 1	1.00	A
63	G2.2.28 1	1.00	D
64	G2.3.1 1	1.00	D
65	G2.3.11 1	1.00	D
66	G2.4.12 1	1.00	C
67	G2.4.4 1	1.00	A
68	WE01G2.1.9 1	1.00	D
69	WE03EK3.3 1	1.00	B
70	WE04EK1.1 1	1.00	D
71	WE08G2.4.20 1	1.00	B
72	WE09EK2.2 1	1.00	D
73	WE11EK2.2 1	1.00	D
74	WE12G2.1.8 1	1.00	B
75	WE16EK2.1 1	1.00	A

SECTION 1 (75 items)**75.00**