Final Submittal
(Blue Paper)

FINAL RO

WRITTEN EXAMINATION

AND REFERENCES

ST. LUCIE MARCH/APRIL 2006-301 EXAM

05000335/2006301 AND 05000389/2006301

MARCH 20 - 29, 2006 AND APRIL 6, 2006

4/24/06

U.S. Nuclear Regulatory Commission

St. Lucie SRO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit:
Region: II	Reactor Type: CE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

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

_____
Applicant's Signature

Results	
RO/SRO-Only/Total Examination Values	____ / ____ / ____ Points
Applicant's Score	____ / ____ / ____ Points
Applicant's Grade	____ / ____ / ____ Percent

Question 001

A reactor trip has occurred on Unit 1.

Which ONE (1) of the following describes the reactor trip indication available on the Reactor Trip Status Panel?

A. UV lights OFF; Shunt lights ON; TCB GREEN lights ON.

B. UV lights ON; Shunt lights OFF; TCB GREEN lights ON.

C. UV lights OFF; Shunt lights ON; TCB WHITE lights ON.

D. UV lights ON; Shunt lights OFF; TCB WHITE lights ON.

Question 002

Given the following:

- Unit 2 Reactor was tripped from full power.
- 160 gpm LOCA existed at time of trip.
- Actions of 2-EOP-03, LOCA, are in progress.
- RCS Thot is 515°F.
- RCS pressure 1700 psia.
- RVLMS Level 4-8 indicate covered.
- 2-EOP-99, Appendices/Figures/Tables/Data Sheets, Appendix J, Restoration of CCW and CBO to the RCPs has been completed.

Which ONE (1) of the following actions must be performed for the above conditions?

A. Stop the RCS depressurization.

B. Reduce RCS pressure, regardless of subcooling.

C. Ensure one (1) RCP secured in each loop.

D. Stop ALL four (4) RCPs.

Question 003

Unit 2 is at full power when the following conditions occur:

- Normal Charging flow was lost due to a rupture in Containment downstream of V2429, Charging Pump Disch at Penetration #27 Isolation.
- The alternate Charging flowpath to the RCS through the HPSI header is being aligned.

Which ONE (1) of the following Limiting Conditions for Operation (LCO) will require the earliest Technical Specification action during this alignment and why?

A. LCO 3.0.3, Limiting Conditions for Operation, due to all Charging pumps placed in STOP.

B. LCO 3.5 2, Emergency Core Cooling Systems, due to the B HPSI header being *inoperable.*

C. LCO 3.1.2.2, Reactivity Control Systems, due to loss of a boron injection flowpath.

D. LCO 3.4.3, Pressurizer, due to the reduction in pressurizer level from RCP Controlled Bleed-Off flow with no charging flow.

Question 004

Given the following conditions on Unit 1:

- Mid Loop Operations are in progress
- LPSI Pump 1A is in service providing Shutdown Cooling.
- LPSI Pump 1B is in Standby.
- LPSI Pump amperage has just started oscillating.
- NO action has been taken by the crew.
- The Unit Supervisor enters ONP-1-0440030, Shutdown Cooling Off-Normal.

Which ONE (1) of the following describes the action(s) required to mitigate the event in accordance with ONP-1-0440030?

A. Raise LPSI Pump flow to increase pump cooling and stabilize amperage.

B. Lower LPSI Pump flow to increase NPSH and stabilize amperage.

C. Start and align LPSI Pump 1B for Shutdown Cooling and Stop LPSI Pump 1A.

D. Start and align LPSI Pump 1B to for Shutdown Cooling and equalize LPSI flow between both trains.

Question 005

Unit 2 is at 100% power when a 'B' side CCW leak occurs.

- Low level alarms on both compartments for the CCW Surge Tank were received.
  - LA-10 – CCW SURGE TANK COMPARTMENT A LEVEL LOW
  - LB-10 - CCW SURGE TANK LEVEL HIGH/ COMPARTMENT B LEVEL LOW
- The leak was subsequently isolated and CCW Surge Tank level has returned to normal.
- NO other actions have been taken

Which ONE (1) of the following describes the expected configuration of the CCW system?

A. Only the 'N' header valves from the 'A' side closed separating the 'A' CCW header from the 'B' side CCW header. The 'N' header valves automatically re-opened when the low level cleared.

B. Only the 'N' header valves from the 'B' side closed separating the 'A' CCW header from the 'B' side CCW header. The 'N' header valves will have to be manually re-opened.

C. All the 'N' header valves closed separating the 'A' CCW header from the 'B' CCW header. The 'N' header valves automatically re-opened when the low level cleared.

D. All the 'N' header valves closed separating the 'A' CCW header from the 'B' CCW header. The 'N' header valves will have to be manually re-opened.

Question 006

What is the reason for verifying that spray line temperatures are approximately equal when isolating the spray valves during a Pressurizer Pressure Control malfunction?

A. Divergence of spray line temperatures may indicate a stuck open spray valve. The stuck open valve is identified as being at the higher temperature and approaching Tcold.

B. Similar spray line temperatures could indicate that both spray valves were open. The stuck open valves are identified as being between Pressurizer temperature and Tcold.

C. Divergence of spray line temperatures may indicate a stuck open spray valve. The stuck open valve is identified as being at the lower temperature and approaching Tcold.

D. Similar spray line temperatures could indicate that both spray valves were closed. The closed valves are identified as being between Pressurizer temperature and Tcold.

Question 007

An ATWS is in progress.

During the performance of EOP-15, Functional Recovery, Reactivity Control, Success Path 2, boration flow should...

A. NOT be stopped until adequate shutdown margin is verified during subsequent actions.

B. be stopped when Wide Range Channels are less than 5×10^{-4}% and lowering.

C. NOT be stopped until shutdown margin is adequate for Cold Shutdown conditions.

D. be stopped when the amount of boron equal to the stuck rods has been added.

Question 008

Unit 2 conditions:

- A SGTR in 2A Steam Generator resulted in a SIAS.
- During the bus transfer a loss of off-site power occurred.
- All vital equipment is being powered from their respective Emergency Diesel Generators.
- RCS cooldown is in progress. Temperatures are as follows:
  - REP CET is 450°F; Loop 2A Thot is 440°F; Loop 2B Thot is 445°F.
- 2A Steam Generator pressure is 750 psia.

Which ONE (1) of the choices completes the following statement regarding RCS depressurization for the current plant conditions in accordance with 2-EOP-04, SGTR?

Depressurize the RCS to no less than _____ psia using _____ Spray.

A. 700; Main

B. 700; Auxiliary

C. 850; Main

D. 850; Auxiliary

Question 009

The following conditions exist during performance of 1-EOP-01, Standard Post Trip Actions:

- 1B AFW Pump is OOS.
- Unit 1 tripped from 100% power.
- Two minutes after the trip the 1AB 125 VDC bus de-energized due to an electrical fault.
- Both Main Feed Pumps tripped due to low flow and CANNOT be restarted.

Which ONE (1) of the following are steps that must be taken in accordance with 1-EOP-01, and why?

A. Close the PORV valves to preserve RCS inventory.

B. Secure one RCP in each loop to minimize heat input into the RCS.

C. Manually control Pressurizer heaters and spray to establish adequate subcooling.

D. Verify that 1A and 1C AFW Pump have started and are providing adequate AFW flow to ensure secondary heat sink requirements are met.

Question 010

Unit 2 is in a station blackout condition. DC loads have been minimized.

Which ONE (1) of the choices correctly completes the following statement regarding SIAS if the blackout lasts for several hours?

As 125 VDC battery voltage lowers, SIAS...

A. will initiate automatically.

B. may be manually actuated ONLY.

C. will be automatically blocked on undervoltage to prevent spurious actuations.

D. must be manually blocked to prevent spurious actuations.

Question 011

A Loss of Off-Site Power has occurred on Unit 1.

Which ONE (1) of the following describes the minimum action required and reason for the action to ensure the Maintenance of Vital Auxiliaries safety function is satisfied in accordance with 1-EOP-09, Loss of Off-Site Power?

A. Verify both vital 4.16 KV buses and both vital DC buses are energized to allow control and monitoring of all other safety functions.

B. Verify at least one vital 4.16 KV bus AND one vital DC bus energized to ensure RCP seal cooling is maintained to prevent loss of RCS inventory.

C. Verify at least one vital 4.16 KV bus AND one vital DC bus energized to allow control and monitoring of all other safety functions.

D. Verify both vital 4.16 KV buses and both vital DC buses are energized to ensure RCP seal cooling is maintained to prevent loss of RCS inventory.

Question 012

Unit 2 was at 100% power, all systems in normal configuration when the following events occurred:

- Numerous secondary annunciators in alarm.
- Generator megawatts decreasing.
- Steam Generator levels decreasing.
- DEH operator auto light OFF.

Which ONE (1) of the following describes the failure that, by itself, has caused the current plant condition?

Loss of:

A. DC Bus 2A/2AA.

B. the SUPS 120 VAC Vital bus.

C. the 120 VAC Instrument Bus 2MB.

D. 480 V MCC AB.

Question 013

How can an operator determine if a Unit 1 vital battery bus is powered from the battery instead of the battery charger?

A. An ammeter on RTGB 101 shows a discharge rate when on the battery.

B. A white light on RTGB 101 is lit only when the battery charger is in service.

C. A voltmeter on RTGB 101 shows a lowering voltage.

D. An ammeter on RTGB 101 shows a discharge rate and a voltmeter on RTGB 101 shows lowering voltage.

Question 014

Unit 2 is at 100% power when a loss of ICW Header 2A occurs.

The crew has been unable to restore ICW to the header.

Which ONE (1) of the following describes action that will be required to extend the time before damage to plant equipment occurs, in accordance with ONOP 2-0640030, ICW Off Normal?

A. Reduce Main Generator MVARs as necessary and reduce Turbine load as necessary to maintain Cold Gas temperature within limits.

B. Close the TCW Heat Exchanger cross-tie, SB13139, and open the 'A' TCW Heat Exchanger shell side isolation valve, SB13147, to maximize TCW Cooling

C. Maximize CCW flow through the unaffected CCW Heat Exchanger by manually throttling flow to no greater than 11,000 gpm.

D. If SG Blowdown is in service, ensure the Open Blowdown Heat Exchanger is aligned to the unaffected header

Question 015

Unit 2 is at 100% power when a loss of Instrument Air occurs. Instrument air pressure is currently 60 psig and lowering.

Which ONE (1) of the following is the required operator action in accordance with ONP 2-1010030, Loss of Instrument Air, and why?

A. Trip the Reactor and Turbine due to inability to maintain Steam Generator levels.

B. Commence a controlled unit downpower due to VCT diverting to Radwaste.

C. Open the Service Air to Instrument Air cross-tie valve to maintain Main Feed Isolation Valve position.

D. Manually open the Unit 1 to Unit 2 Instrument Air cross-tie bypass valve to supply Unit 1 air to Unit 2.

Question 016

Unit 1 was tripped from 70% power due to rising backpressure in the Main Condenser.

During the performance of SPTAs, the RCO determines that Condenser Backpressure has stabilized at 20 inches Hg.

Assuming NO action has been taken by the crew, which ONE (1) of the following describes the value of Tave and how it is being maintained?

A. 532-535°F, maintained by one ADV on each SG.

B. 532-535°F, maintained by 2 ADVs on each SG.

C. 540-545°F, maintained by intermittent MSSV operation.

D. 550-555°F, maintained by intermittent MSSV operation.

Question 017

Given the following conditions:

Unit 2 reached 100% power 1 hour ago after a load increase following Refueling.

The following indications are occurring:

- Annunciator, K-25, REACTOR T-AVG/T-REF TEMP LOW
- Annunciator L-17, REACTOR POWER LVL HI CHNL PRE-TRIP

Which ONE (1) of the following is the cause of these indications, and what action is required?

A. Xenon concentration is rising. Adjust Tavg by withdrawing CEAs.

B. Xenon concentration is lowering. Adjust Tavg by RCS boration.

C. An ESD is occurring. Reduce turbine load to match Tavg and Tref.

D. An ESD is occurring. Reduce reactor power by inserting CEAs.

Question 018

Which ONE (1) of the following describes how RCS pressure will initially respond to a Loss of Main Feedwater, and why?

A. Increase, because the RCS ΔT power increases until the reactor trip occurs.

B. Increase, because the RCS temperature increases due to elevated Steam Generator temperatures.

C. Decrease, because the increased boiling rate in the Steam Generator tube bundle region decreases Tavg.

D. Decrease, because the Steam Generator level initially increases, causing a contraction of the RCS inventory.

Question 019

During a Unit 1 reactor startup, power has been stable for one hour at 15%.

- CEAs are at 110" on group 7.
- The turbine is on line.
- The CEDS control is placed in Manual Individual mode to withdraw one CEA that is 4" below the group.

If a continuous rod withdrawal were to occur when the RCO initially withdraws the rod, which ONE (1) of the following will occur?

A. Tave and Tref will increase as power rises; the CEA withdrawal will stop when steam bypass demand begins.

B. Tave and Tref will increase as power rises; the CEA withdrawal will stop when any of the cold leg temperatures exceed 549°F.

C. Tave will increase as power rises; Tref will remain approximately the same; the CEA withdrawal will stop when Tave is 6.6°F greater than Tref.

D. Tave will increase as power rises; Tref will remain approximately the same; the CEA withdrawal will stop when a group deviation occurs.

Question 020

Unit 1 is conducting a downpower from 80% to 60% when CEA #41 FAILS to insert during insertion of Group 7.

Assuming CEA #41 is trippable, which ONE (1) of the following will be adversely affected if Group 7 rod insertion continues?

A. Core power distribution and shutdown margin.

B. Shutdown margin and power defect.

C. Power defect and critical heat flux.

D. Critical heat flux and Core power distribution.

Question 021

Given the following Unit 2 conditions:

- An ATWS has occurred.
- CEDM MG sets were de-energized by opening their Load Center supply breakers.
- The RCO has started an emergency boration using V2514, emergency boration valve.
- SIAS has NOT actuated.
- RCS pressure is 2210 psia and trending DOWN.
- Tcold is 555°F and slowly trending DOWN.

Which ONE (1) of the following correctly describes conditions resulting from emergency boration?

A. Boric Acid Makeup Tank level will drop at a rate approximately equal to charging flow.

B. Volume Control Tank level will drop at a rate approximately equal to charging flow.

C. Refueling Water Tank level will drop at a rate approximately equal to charging flow.

D. Pressurizer level will rise at a rate approximately equal to charging flow.

Question 022

Unit 1 is at 100% power

A leak has developed in the reference leg for Pressurizer level transmitter LT-1110X, the selected level transmitter.

Which ONE (1) of the following describes the response of indicated level on LT-1110X and actual pressurizer level?

A. Indicated pressurizer level will rise. Actual pressurizer level will rise.

B. Indicated pressurizer level will rise. Actual pressurizer level will lower.

C. Indicated pressurizer level will lower. Actual pressurizer level will rise.

D. Indicated pressurizer level will lower. Actual pressurizer level will lower.

Question 023

A Unit 2 startup is in progress.

Which ONE (1) of the following group of indications can be used to determine a loss of Wide Range Channel instrumentation?

A. Count per second and % power meters drop to zero
Loss of audible countrate in the Control Room
LOG LED is extinguished; LOG TROUBLE LED is lit

B. % power meter drops to zero
Zero Power Mode Bypass LED is illuminated
LOG LED is extinguished; LOG TROUBLE LED is lit

C. Count per second and % power meters drop to zero
Zero Power Mode Bypass LED is illuminated
LOG LED is illuminated; LOG TROUBLE LED is extinguished

D. % power meter drops to zero
Loss of audible countrate in the Control Room
LOG LED is illuminated; LOG TROUBLE LED is extinguished

Question 024

Given the following in the Unit 2 Containment:

- Fuel movement is in progress.
- A fuel assembly is inadvertently dropped and badly damaged.

ALL of the following are IMMEDIATE ACTIONS in accordance with 2-ONP-1600030, Accidents Involving New or Spent Fuel, EXCEPT:

A. Evacuate the Containment Building.

B. Notify Health Physics personnel.

C. Sound the Containment Evacuation Alarm.

D. Stop HVE-8A, and HVE-8B, Containment Purge Fans.

Question 025

A liquid release of Waste Monitor Tank 1A is in progress on Unit 1 when the high radiation alarm is received on Liquid Monitor Channel 43. Which ONE (1) of the following describes a potential cause for this alarm?

A. Flow control valve FCV-6627X has failed closed.

B. An unexplained level decrease in Waste Monitor Tank 1B.

C. Low level setpoint in Waste Monitor Tank 1A.

D. A Circulating Water pump has tripped.

Question 026

2-ONP-100.02, Control Room Inaccessibility is being performed.

The following conditions exist:

- Appendix A, RCO A Subsequent Actions are complete.
- Appendix B, RCO B Subsequent Actions are complete.
- Appendix C, Unit Supervisor Subsequent Actions are complete.
- Appendix D, SNPO Subsequent Actions are complete.
- The 2A EDG overspeed trip levers have **not** been placed in TRIP.
- Offsite power is available.

Which ONE (1) of the following describes the condition of Emergency Diesel Generator 2A and Bus 2A3 if offsite power is lost?

A. EDG 2A is running. Bus 2A3 is de-energized.

B. EDG 2A is running. Bus 2A3 is energized.

C. EDG 2A is NOT running. Bus 2A3 is de-energized.

D. EDG 2A is started prior to Control Room evacuation. Bus 2A3 is energized.

Question 027

Unit 1 is performing a natural circulation cooldown with the following conditions:

- RCS pressure 1250 psia.
- CET: 555°F.
- Reactor Vessel Head temperature (QSPDS Pg. 211): 572°F.
- Reactor Vessel Level indicates 2 segments voided.
- Pressurizer level is 60% and rising rapidly

Which ONE (1) of the following actions will stabilize pressurizer level in accordance with 1-0120039, Natural Circulation Cooldown, and why?

A. Stop the Backup Charging Pumps to minimize Charging flow.

B. Operate additional Pressurizer heaters to increase RCS pressure.

C. Initiate Auxiliary Spray flow to reduce RCS pressure.

D. Increase Letdown flow to maximum to maintain pressurizer level less than 70%.

Question 028

Unit 2 is at 100% power with the following indications on the 2B1 Reactor Coolant Pump:

- Controlled Bleedoff (CBO) temperature is 225°F.
- CBO flow is 2.5 gpm.
- Vapor seal cavity (bleedoff cavity) pressure is 80 psig.
- Upper seal cavity pressure is 2235 psig.
- Middle seal cavity pressure is 2235 psig.
- RCS pressure is 2235 psig.

Which ONE (1) of the following describes the status of 2B1 RCP, and what action is required?

A. CBO temperature is above the limit; requires power reduction and 2B1 RCP shutdown when the TCBs are open.

B. 2 seals have failed; requires power reduction and 2B1 RCP shutdown when the TCBs are open.

C. CBO temperature is above the limit; requires immediate reactor trip and 2B1 RCP shutdown.

D. 3 seals have failed; requires immediate reactor trip and 2B1 RCP shutdown.

Question 029

Unit 1 is operating at 100% power when the Component Cooling water temperature control valve on the Letdown Heat Exchanger fails closed.

Which ONE (1) of the following describes the automatic response of the CVCS?

Letdown:

A. isolates on high VCT temperature.

B. Stop Valve V2515, closes on high temperature.

C. diverts to the Waste management system on high temperature.

D. bypasses the Purification ion exchangers on high temperature.

Question 030

Given the following:

- Unit 1 has been in EOP-03, Loss of Coolant Accident for 5 hours.
- The crew is performing Appendix O, Simultaneous Hot and Cold Leg Injection.
- LPSI is unavailable for alignment using the most preferred method.
- 1A HPSI Pump has tripped and CANNOT be restarted.
- The US determines that the second alternate method of Simultaneous Hot and Cold Leg Injection must be used.

Which ONE (1) of the following describes the equipment alignment required to perform Appendix O?

A. HPSI Pump 1B through the auxiliary sprays.

B. HPSI Pump 1B through the opposite train hot leg suction.

C. Containment Spray Pump 1A or 1B through the auxiliary sprays.

D. Containment Spray Pump 1A or 1B through the opposite train hot leg suction.

Question 031

Given:

- A small break LOCA has occurred inside Containment on Unit 2
- SIAS has actuated.
- Containment pressure increased from 0 to 3.5 psig.
- Pressurizer Level indicates 32% and rising slowly.
- RCS subcooling is 102 degrees F.
- Secondary Heat Sink is being maintained.
- The RO has determined HPSI Throttle Criteria has been met.

Which ONE (1) of the following describes the relationship between indicated and actual pressurizer level and the effect on HPSI Throttle Criteria?

Actual Pressurizer level is...

A. LOWER than indicated level because of the direct effect of elevated containment pressure. The indicated level for throttle criteria accounts for level error.

B. LOWER than indicated level because the reference leg fluid density decreases. The indicated level for throttle criteria accounts for level error.

C. HIGHER than indicated level because of the direct effect of elevated containment pressure, ensuring adequate RCS inventory prior to throttling HPSI.

D. HIGHER than indicated level because the reference leg fluid density decreases, ensuring adequate RCS inventory prior to throttling HPSI.

Question 032

Unit 2 Quench Tank pressure has been lowering. Which ONE (1) of the following is a possible result of the dropping pressure?

Pressures less than 1 psig could...

A. increase the possibility of PORV and Pressurizer Safety Valve leakage.

B. cause Quench Tank level indication to read higher than expected.

C. draw Quench Tank liquid into the Pressurizer Safety Valve tailpipe header.

D. cause Quench Tank level indication to read lower than expected.

Question 033

Given:

- Unit 2 is operating at 100% power.
- CCW Pumps 2B and 2C are running.
- CCW Pump 2A is tagged out for maintenance.
- Annunciator S-32, 2B CCW PUMP OVRLD/TRIP is in alarm.

Attempts to restart CCW Pump 2B are NOT successful.

What action is required to be performed per 2-ONP-0310030, Component Cooling Water Off-Normal?

A. Close all "B" Train N Header isolation valves.

B. Increase ICW cooling to the operating CCW HX to maximum.

C. Align the 2C CCW Pump suction and discharge headers to the 2B header.

D. Ensure all N Header isolation valves are open and then isolate unnecessary loads.

Question 034

Given the following Unit 1 conditions:

- Plant is in Mode 3 when the PORV inadvertently lifts during I&C testing.
- Pressurizer pressure is 2000 psia.
- RCS temperature is 500°F.
- PORV tailpipe temperature is 230°F.
- Containment pressure is 0.5 psig.

Which ONE (1) of the following describes the expected pressure in the Quench Tank?

A. ~2 psig

B. ~5 psig

C. ~20 psig

D. ~35 psig

Question 035

Given the following:

- Unit 1 is at 100% power.
- PT-07-2A, Containment pressure transmitter fails high.
- NO action has been taken to bypass PT-07-2A.
- A loss of the MD instrument bus occurs.

Which ONE (1) of the following Engineered Safety Features Actuation signals will actuate?

A. SIAS, CSAS, MSIS and CIAS.

B. CSAS and SIAS.

C. SIAS, MSIS and CIAS.

D. SIAS and CIAS.

Question 036

Given the following conditions on Unit 2:

- A large break LOCA is in progress.
- All ESF actuations have occurred as required.
- RCS pressure is 200 psig.
- Containment pressure is 16 psig.
- Refueling Water Tank level is 3.5 feet.

Which ONE (1) of the following describes the equipment alignment for the current plant conditions?

A. HPSI Pumps running with Mini-Flow isolation valves open.

B. HPSI Pumps off with Mini-Flow isolation valves closed.

C. LPSI pumps running with Mini-Flow isolation open

D. LPSI pumps off with Mini-Flow isolation valves closed.

Question 037

Unit 2 was operating in MODE 1 when a LOCA occurred inside Containment.

The following conditions are noted:

- The reactor has tripped. A Loss of Off-Site Power has occurred.
- RCS pressure is 1750 psia and lowering slowly.
- Containment Pressure is 3.6 psig and rising slowly.
- 2A DG FAILED to start.
- All other equipment is functioning as designed.

Which ONE (1) of the following describes the operation of the Containment Fan Coolers (CFCs)?

A. 1C and 1D CFCs are running in FAST speed.

B. 1B and 1D CFCs are running in FAST speed.

C. 1C and 1D CFCs are running in SLOW speed.

D. 1B and 1D CFCs are running in SLOW speed.

Question 038

Given the following conditions:

- A LOCA has occurred.
- CSAS did NOT actuate automatically or manually.
- All other required actions have occurred.
- Bus 2B3 is locked out.
- RCS pressure is 600 psig.
- Containment pressure is 6 psig and rising.
- Containment temperature is 220°F.

Which ONE (1) of the following describes the MINIMUM actions required to reduce containment temperature in accordance with EOP-01, SPTAs?

A. Start Containment Spray Pump 2A and open its Spray Header Valve. Verify at least 1 Containment Fan Cooler running.

B. Start Containment Spray Pumps 2A and 2B and open their Spray Header Valves. Verify at least 1 Containment Fan Cooler running.

C. Start Containment Spray Pump 2A and open its Spray Header Valve. Verify 2 Containment Fan Coolers are running.

D. Start Containment Spray Pump 2A and 2B and open their Spray Header Valves. Verify 2 Containment Fan Coolers are running.

Question 039

Given the following:

- Unit 2 is at 2% power.
- ADV controls for BOTH Steam Generators are in AUTO/AUTO, set at 900 psia.
- A Loss of offsite power (LOOP) occurs resulting in a reactor trip.
- Both EDGs start and re-energize their respective buses.

How will the Atmospheric Dump Valves for the 2A Steam Generator respond to control Main Steam Header pressure?

A. Fail closed and then re-open to control pressure at 900 psia.

B. Fail as is and must be manually reset prior to automatic operation to control SG pressure.

C. Fail as is and then throttle to control pressure at 900 psia upon EDG loading

D. Fail closed and must be manually reset prior to automatic operation to control SG pressure.

Question 040

Given the following:

- 2-GOP-201, Reactor Plant Startup – Mode 2 to Mode 1 is in progress.
- The unit is in Mode 2 with Main Feedwater in service maintaining Steam Generator levels.
- Main Turbine trip testing is in progress.
- The Main Turbine is latched and then manually tripped.
- NO operator actions are taken after the turbine trip.

Which ONE (1) of the following describes the response of the feedwater system and Steam Generator level?

The 2A 15% feedwater bypass valve will:

A. position to its 5% flow post-trip feed position and Steam Generator A level will rise.

B. position to its 5% flow post-trip feed position and Steam Generator A level will lower.

C. Remain in its current position and Steam Generator A level will rise.

D. Remain in its current position and Steam Generator A level will lower.

Question 041

The following conditions exist on Unit 2:

- Unit tripped from 80% power.
- 2A and 2B Steam Generator levels decreased to 10% narrow range and have recovered to 30% narrow range on all channels.

Assuming NO operator action, which ONE (1) of the following describes the status of the Auxiliary Feedwater system?

A. The 2A, 2B and 2C Auxiliary Feedwater pumps are feeding at full flow.

B. The 2A and 2B Auxiliary Feedwater pumps are feeding at 220 gpm each.

C. The 2A, 2B and 2C Auxiliary Feedwater pumps have stopped and their discharge valves closed.

D. The 2A, 2B and 2C Auxiliary Feedwater pumps are running and their discharge valves closed.

Question 042

Unit 1 is Cross-tying the 1A2 Load Center to the 1B2 Load Center with 1B2 supplying.

Which Containment Coolers should be removed from service and why?

A. HVS-1A & HVS-1C to minimize single EDG loading should a loss of off-site power occur.

B. HVS-1A & HVS-1B to minimize the loading on the crosstie cables.

C. HVS-1B & HVS-1D to minimize single EDG loading should a loss of off-site power occur.

D. HVS-1C & HVS-1D to minimize the loading on the crosstie cables.

Question 043

Unit 2 is at 100% power.

The following alarm is received in the control room:

- A-40, BUS/BATT CHGR 2AB GROUND

An NPO is sent to determine if there is a ground on Bus 2AB.
Bus 2AB is NOT cross-tied to Bus 2A/2AA or 2B/2BB

Which ONE (1) of the following describes the indication that will exist if the POSITIVE side of the DC Bus has a ground, and the action that will be taken if a ground exists?

The ground test light will be:

A. dimmer than the negative light. Isolate supplies to the DC Bus to determine if the Charger or Battery is causing the ground

B. dimmer than the negative light. Isolate individual DC Bus loads to determine which load is causing the ground.

C. brighter than the negative light. Isolate supplies to the DC Bus to determine if the Charger or Battery is causing the ground

D. brighter than the negative light. Isolate individual DC Bus loads to determine which load is causing the ground.

Question 044

Which ONE (1) of the following describes the Unit 2 Emergency Diesel Generator Diesel Fuel Oil Transfer Pump power supplies?

A. 480V MCC 2A5/2B5.

B. 480V MCC Bus 2A7/2B7.

C. 120 VAC Bus 2MA/2MC.

D. 125 VDC Bus 2A/2B.

Question 045

If a valid high radiation alarm is received on the 2B Steam Generator Blowdown Radiation Monitor on Unit 2, which ONE (1) of the following automatic actions will occur?

A. The SG blowdown isolation valves and the blowdown sample isolation valves for both SGs will close.

B. The SG blowdown isolation valve and the blowdown sample isolation valve for the 2B SG will close.

C. Only the SG blowdown isolation valve for the 2B SG will close, the SG blowdown sample isolation valves for both SGs close.

D. Only the SG blowdown isolation valve for the 2B SG will close, the SG blowdown sample valves remain open.

Question 046

The following conditions exist on Unit 2:

- The Unit has experienced a Safety Injection Actuation.
- Manual action was required to place ICW to TCW supply valves, MV-21-2 and MV-21-3, in their proper position.
- The SIAS signal has been reset.
- NO other actions are taken

What is the effect on Turbine Cooling Water (TCW) with the configuration of Intake Cooling Water (ICW) at this time?

TCW temperature is:

A. steady or rising while ICW flow is being supplied to the essential and non-essential headers.

B. lowering while ICW flow is being supplied to the essential header only.

C. lowering while ICW flow is being supplied to the essential and non-essential headers.

D. steady or rising while ICW flow is being supplied to the essential header only.

Question 047

Which ONE (1) of the following supplies power to the Unit 2 Instrument Air Compressor Emergency Cooling Pump and Fan?

A. MCC-2C

B. MCC-2A5

C. MCC-2AB

D. MCC-2B5

Question 048

Unit 2 is in Mode 6 performing fuel movement.

Which ONE (1) of the following conditions requires fuel movement to be stopped?

A. Equipment Hatch is open and capable of closure in 35 minutes.

B. Open Containment Purge Makeup air manual isolation valves are open with administrative controls (Open PEN Log).

C. Only one personnel airlock door is capable of being closed.

D. Only one individual is stationed at the Personnel Airlock Door with the doors open.

Question 049

Given the following conditions:

- Unit 2 is at 35% power.
- All pressurizer heaters are "ON".
- Green lights for Pressurizer Spray valves PCV-1100E & F are illuminated.
- RCS pressure is 1880 psig and lowering slowly.
- Pressurizer tailpipe temperature is 220°F.
- RED and GREEN lights for Pressurizer PORV V-1474 are illuminated.
- PORV V-1474 control switch is in OVERRIDE.

Based upon current plant conditions, which ONE (1) of the following describes the MINIMUM set of actions required?

A. Continue performing actions of 2-0120036, Pressurizer Relief/Safety Valve. Close block valve V-1476 and verify temperature decrease on TIA-1110. Remove power from V-1476.

B. Trip the reactor. Enter EOP-01, Standard Post Trip Actions, and close block valve V-1476.

C. Close block valve V-1476 verify temperature decrease on TIA-1110. Refer to 2-1-0120031, Excessive Reactor Coolant System Leakage.

D. Trip the reactor, initiate Safety Injection, and Enter EOP-01, Standard Post Trip Actions.

Question 050

With 2A DC bus battery charger placed in the EQUALIZING mode, which ONE (1) of the following will occur?

A. Charger output voltage immediately rises to the equalize setting, battery voltage will slowly rise and amps will lower as the battery charges.

B. Charger output voltage remains the same, battery voltage will slowly rise and amps will lower as the battery charges.

C. Charger output voltage and battery voltage immediately rise to the equalize setting and amps lower as the battery charges.

D. Charger output voltage lowers to the equalize setting, battery voltage will slowly lower and amps will lower as the battery discharges.

Question 051

Unit 2 was operating at 100% power when an electrical transient occurs.

Given the following events and conditions:

- All Intake Cooling Water (ICW) Pumps are running while swapping ICW pumps.
- 2AB buses are aligned to the 'A' Train.
- The 2B3 bus becomes deenergized and is now powered from the 2B Emergency Diesel.
- All other electrical buses remain energized.

Which ONE (1) of the following is a complete list of running ICW pumps and what action is required to restore equipment to its correct emergency power source?

A. 2A and 2C ICW pumps;
Remain in this alignment until bus 2AB is aligned to bus 2A2.

B. 2C ICW pump;
Start the 2A ICW pump and restore bus 2B3 to bus 2B2.

C. 2A and 2B ICW pumps;
Start the 2C ICW Pump and stop the 2A ICW Pump.

D. 2A, 2B and 2C ICW pumps;
Secure the 2C ICW pump and place in pull-to-lock.

Question 052

The 2C Component Cooling Water Pump is aligned to automatically start on an SIAS.

For this to occur, the 2B CCW Pump is configured with its:

A. RTGB control switch in the "Pull-to-Lock" position.

B. Breaker in the "Racked Out" position.

C. Breaker DC control power fuses removed.

D. NORMAL/ISOLATE switch in the ISOLATE position.

Question 053

Which ONE (1) of the following describes the function of the 1A & 1B CCW Heat Exchanger Outlet Valves (TCV-14-4A & 4B)?

A. Controls ICW flow through the CCW heat exchanger to maintain CCW Heat Exchanger CCW outlet temperature at 115°F.

B. Controls CCW flow through the CCW heat exchanger to maintain CCW Heat Exchanger CCW outlet temperature at 115°F.

C. Controls CCW flow through the CCW heat exchanger to maintain CCW Heat Exchanger CCW outlet temperature at 100°F.

D. Controls ICW flow through the CCW heat exchanger to maintain CCW Heat Exchanger CCW outlet temperature at 100°F.

Question 054

Assume a Large Break LOCA raises containment pressure to 11 psig.

Compare the automatic response of the Main Steam Isolation Valves (MSIVs) for this LOCA on Unit 1 to that on Unit 2.

On Unit 1, the MSIVs _____; On Unit 2, the MSIVs _____.

A. close; close

B. close, remain open

C. remain open; close

D. remain open; remain open

Question 055

Given the following conditions:

- Unit 2 is in Mode 6. Fuel is in the reactor vessel.
- RCS temperature is 105°F
- Shutdown Cooling loop 'A' is in service using Low Pressure Safety Injection Pump 2A.
- 23.5 feet of water above the reactor vessel flange.
- NO Core Alterations or movement of Irradiated Fuel Assemblies are in progress.
- It is desired to stop Shutdown Cooling for approximately 30 minutes to move lighting and equipment in the refueling cavity

Which ONE (1) of the following correctly describes the requirement associated with this evolution?

A. The RCS must be reduced to less than 100°F.

B. Immediately close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.

C. Activities involving reduction of RCS boron concentration are not permitted.

D. Cavity level must be raised to greater than 25 feet above the reactor vessel flange.

Question 056

The pressurizer heaters are supplied power from 480 Volt Load Center

A. A1/B1 which is directly supplied from 4160 volt Bus A2/B2.

B. A1/B1 which is directly supplied from 4160 volt Bus A3/B3.

C. A3/B3 which is directly supplied from 4160 volt Bus A2/B2.

D. A3/B3 which is directly supplied from 4160 volt Bus A3/B3.

Question 057

Unit 1 is in Mode 1.

Annunciator L-20, REACTOR POWER RANGE SUBCHANNEL DEVIATION, is received.

Which ONE (1) of the following describes the cause of the alarm and the setpoint for the alarm?

A. Wide Range Power channels deviate by 0.5 decades.

B. Wide Range Power channels deviate by 1.0 decade.

C. Linear Range channels deviation setpoint 6%.

D. Linear Range channels deviation setpoint 2%.

Question 058

If a fire in the Unit 1 Cable Spreading Room burns for 45 minutes before it is extinguished, which ONE (1) of the following instruments can be relied on for plant control?

A. Pressurizer Pressure Safety Channel Indicator PI-1102A.

B. Pressurizer Pressure Safety Channel Indicator PI-1102B.

C. Pressurizer Pressure Control Channel Indicator PIC-1100X.

D. Pressurizer Pressure Low Range Pressure Indicator PI-1103.

Question 059

Which ONE (1) of the following describes the basis for the size difference between the Unit 1and Unit 2 Condensate Storage Tanks (CST)?

Unit 2 CST volume:

A. was designed to supply a specified amount of makeup to Unit 1 in the event of total loss of AC power to Unit 1.

B. was designed to supply a specified amount of makeup to Unit 1 in the event of damage to Unit 1 CST.

C. is analyzed for a 8 hour HOT STANDBY period following a Loss of Offsite Power, Unit 1 is analyzed for a 4 hour period.

D. is analyzed for a cooldown to Shutdown Cooling entry conditions following a period of HOT STANDBY, Unit 1 is analyzed for HOT STANDBY only.

Question 060

A Containment Purge to maintain Containment Pressure within Technical Specification limits is planned on Unit 2.

All prerequisites, precautions, and limitations of NOP-25.02, Continuous Containment/Hydrogen Purge System Operation, are met.

Which ONE (1) of the following describes the correct sequence of action to initiate the purge?

A. Adjust the setpoint of FCV 25-9, Control Valve Filter Inlet, to the flow rate prescribed on the release permit
Place the control switches for Continuous Ctmt Purge Makeup Valves FCV-25-26 and FCV 25-36 in OPEN;
Start BOTH Continuous Containment/H2 Purge Fans, HVE-7A AND HVE-7B;

B. Adjust the setpoint of FCV 25-9, Control Valve Filter Inlet, to the flow rate prescribed on the release permit
Place the control switches for Continuous Ctmt Purge Makeup Valves FCV-25-26 and FCV 25-36 in OPEN;
Start ONE Continuous Containment/H2 Purge Fan, HVE-7A OR HVE-7B;

C. Place the control switches for Continuous Ctmt Purge Makeup Valves FCV-25-26 and FCV 25-36 in OPEN;
Start ONE Continuous Containment/H2 Purge Fan, HVE-7A OR HVE-7B;
Open and adjust FCV 25-9, Control Valve Filter Inlet, to the flow rate prescribed on the release permit

D. Place the control switches for Continuous Ctmt Purge Makeup Valves FCV-25-26 and FCV 25-36 in OPEN;
Start BOTH Continuous Containment/H2 Purge Fans, HVE-7A AND HVE-7B;
Open and adjust FCV 25-9, Control Valve Filter Inlet, to the flow rate prescribed on the release permit

Question 061

Unit 1 has been in a refueling outage for 14 days, with a total core offload in progress.

Which ONE (1) of the following requires immediate suspension of refueling operations?

A. Loss of two of the four operable Wide Range neutron flux monitors.

B. A Containment electrical penetration is removed for repairs under administrative controls.

C. Refueling cavity level is 22 feet above the top of fuel assemblies that are seated in the reactor.

D. Refueling cavity level is 22 feet above the top of the reactor flange.

Question 062

Given the following conditions:

- Unit 2 is operating at 45% power.
- The SBCS Valve Permissive switch is in MANUAL.
- SBCS Valve Controllers are in AUTO.
- A reactor trip occurs.

Which ONE (1) of the following describes the SBCS response?

A. SBCS Valves Quick Open.

B. SBCS Valves Modulate Open.

C. SBCS Valves remain closed. Atmospheric Dump Valves must be manually opened.

D. SBCS Valves remain closed. Atmospheric Dump Valves will throttle open automatically.

Question 063

Given the following:

- Unit 1 is at 100% power.
- Tave has slowly INCREASED 0.2°F in the last 5 minutes.
- Main Generator output has DECREASED 6 MWe.

Which ONE (1) of the following describes the cause of the above indications?

A. SG Safety Valve leakage.

B. Condenser Air Ejector malfunction.

C. Inadvertent RCS dilution.

D. Inadvertent Control Rod withdrawal.

Question 064

Due to a loss of instrument air, Unit 2 Instrument Air System has been cross-tied with the Station Air System and pressure has stabilized at 100 psig.

Which ONE (1) of the following actions must be taken within 1 hour in accordance with ONP-2-1010030, Loss of Instrument Air?

A. Initiate a controlled downpower and take the Unit off the line.

B. Cross tie Construction Air to augment Station Air.

C. Blow down the Instrument Air header drains to remove oil, water, and crud build-up.

D. Isolate the Station Air cross-tie and open the Unit 1 cross-tie to the Unit 2 Instrument Air System.

Question 065

Which ONE (1) of the following would result upon loss of 120V Vital AC instrument bus MA?

A. 2 TCBs open, no reactor trip.

B. 2 TCBs open, reactor trips.

C. 4 TCBs open, no reactor trip.

D. 4 TCBs open, reactor trips.

Question 066

Which ONE (1) of the following procedural words or phrases allows an operator to reposition a valve during performance of a Normal Operating Procedure?

A. Verify

B. Check

C. Ensure

D. Implement

Question 067

Given the following:

- Unit 2 is in Mode 3.
- RCS pressure is 1800 psia.

Which ONE (1) of the following, if declared *inoperable,* requires Technical Specification ACTION within ONE (1) hour?

A. Refueling Water Tank.

B. 1 CEA Reed Switch Position Indicator.

C. One Main Steam Isolation Valve.

D. One Main Steam Line Code Safety Valve.

Question 068

The following conditions exist on Unit 1after a LOCA occurred from full power:

- The 1A1 SIT isolation valve V-3614 is OPEN.
- RCS pressure is 600 psia and slowly dropping.
- SIAS has NOT been RESET.
- The supply breaker to the 1A1 SIT isolation valve is ON.

Which ONE (1) of the following describes the 1A1 SIT isolation valve V-3614 response to placing the RTGB hand switch for the 1A1 SIT in the PIC BYPASS CLOSE position?

A. V-3614 immediately CLOSES.

B. V-3614 will CLOSE when RCS pressure drops below 276 psia.

C. V-3614 remains OPEN; the SIAS must be reset for it to CLOSE.

D. V-3614 remains OPEN; RCS pressure must be below 325 psia for the valve to close.

Question 069

During a reactor startup it becomes apparent that the reactor will become critical approximately 700 pcm earlier than the ECC calculation.

Which ONE (1) of the following describes the correct course of action in accordance with 2-GOP-302, Reactor Plant Startup – Mode 3 to Mode 2?

A. Stop the CEA withdrawal, maintaining present rod height, and verify 1/M predicted rod position greater than minimum rod height for criticality.

B. Stop the CEA withdrawal. Ensure CEAs are inserted to a position equivalent to -500 pcm from the apparent critical position.

C. Stop the CEA withdrawal. Borate the RCS until criticality is predicted within the proper band. Recalculate the ECC prior to continuing CEA withdrawal.

D. Continue the CEA withdrawal to within 500 pcm from the apparent critical position, maintaining this rod height until the RE determines the appropriate CEA movement actions.

Question 070

Instrumentation & Control (I&C) has requested a clearance to de-energize a component by removing its fuses.

Which ONE (1) of the following statements describes how removal of the fuses is controlled according to ADM-09.08, Operations In-Plant Equipment Clearance Orders?

A. By direction of the I&C work order.

B. Equipment clearance order tags placed on the fuses.

C. A non-tagged step in the Equipment clearance order.

D. Equipment clearance order tags placed on or close to the fuse holders.

Question 071

Unit 2 is operating in Mode 1.

Which ONE (1) of the following Maintenance activities requires entry into a Technical Specification LCO action statement?

A. I&C Monthly Functional Test of the 2A Plant Vent Radiation Monitor (PIG).

B. Repair of 2C Intake Cooling Water Pump.

C. I&C Monthly Functional Test of the 2A Hydrogen Analyzer.

D. Monthly Code Run of the 2A Auxiliary Feedwater Pump.

Question 072

Given the following:

- A large break LOCA has occurred on Unit 1.
- HPSI Pump 1A has developed a 40 gpm leak on the pump suction.
- Attempts to isolate HPSI Pump 1A have failed.
- RAS has actuated.
- An Emergency Team member who is 49 has volunteered to close HPSI Pump 1A suction valve locally.

The MAXIMUM allowed CDE (thyroid) exposure the Emergency Coordinator can authorize the Emergency Team member to receive while performing this evolution is:

A. 25 REM.

B. 50 REM.

C. 100 REM.

D. No upper limit for CDE exposure.

Question 073

A shutdown is required due to Dose Equivalent I-131 level of five microcuries/gram.

Which ONE (1) of the following is the reason for reducing Tave to less than 500°F following the reactor shutdown?

A. Prevents the direct release of activity should a Steam Generator Tube Rupture occur.

B. Slows the release of noble gas to the Reactor Coolant, reducing the source term of the activity.

C. Minimizes the temperature related degradation of the CVCS demineralizers while RCS clean-up is in progress.

D. Minimizes the magnitude of the iodine spiking phenomena caused by the unit shutdown.

Question 074

The following conditions exist:

- Mode 3 performing a controlled cooldown.
- RCS Tave: 450°F.
- Steam Generator pressure: 413 psia.
- RCS pressure: 1280 psia.

Fifteen minutes after the turnover the following condition exist:

- RCS pressure and pressurizer level are falling.
- RCS temperature is falling.
- Steam Generator pressure is falling.

What procedure and mitigation strategy should be implemented?

A. ONP-01.01, Plant Condition 1 - SG Heat Removal LTOP not in effect.
Attempt to isolate the affected SG.
Maintain RCS subcooling 20-200°F.

B. ONP-01.02, Plant Condition 2 - SG Heat Removal LTOP in effect.
Manually actuate MSIS and SIAS.
Stabilize RCS temperature and pressure.

C. EOP-05, Excess Steam Demand.
Manually actuate MSIS.
Maintain RCS subcooling 20-200°F.

D. EOP-15, Functional Recovery.
Emergency borate and attempt to isolate the affected SG.
Stabilize RCS temperature and pressure.

Question 075

Given:

- Unit 1 is operating at 100% power.
- Only the 1B Charging Pump is running.
- Annunciator M-31 "1B CHARGING PUMP TROUBLE" goes into alarm.
- All other alarms are clear

Which ONE (1) of the following describes the status of 1B Charging Pump, and the action that is required in accordance with the ARP?

A. Pump is tripped on low Seal Tank level; start the standby charging pump or isolate letdown.

B. Pump is running with low Seal Tank level; stop charging pump 1B, isolate letdown, and start the backup charging pump.

C. Pump is running with low Reducing Unit oil level; start the standby charging pump and stop charging pump 1B.

D. Pump is tripped on low Reducing Unit oil level; start the standby charging pump.