

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

Applicant Information

Name: MASTER

Date: April 23, 2004

Facility/Unit: Prairie Island U1/U2

Region: III

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 six hours after the examination starts.

Applicant Certification

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

Applicant's Signature

Results

Examination Value _____ Points

Applicant's Score _____ Points

Applicant's Grade _____ Percent

APPENDIX E
POLICIES AND GUIDELINES FOR TAKING NRC EXAMINATIONS

PART A - GENERAL GUIDELINES

1. **[Read Verbatim]** Cheating on any part of the examination will result in a denial of your application and/or action against your license.
2. If you have any questions concerning the administration of any part of the examination, do not hesitate asking them before starting that part of the test.
3. SRO applicants will be tested at the level of responsibility of the senior licensed shift position (i.e., shift supervisor, senior shift supervisor, or whatever the title of the position may be).
4. You must pass every part of the examination to receive a license or to continue performing license duties. Applicants for an SRO-upgrade license may require remedial training in order to continue their RO duties if the examination reveals deficiencies in the required knowledge and abilities.
5. The NRC examiner is not allowed to reveal the results of any part of the examination until they have been reviewed and approved by NRC management. Grades provided by the facility licensee are preliminary until approved by the NRC. You will be informed of the official examination results about 30 days after all the examinations are complete.

PART B - WRITTEN EXAMINATION GUIDELINES

1. **[Read Verbatim]** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.
2. To pass the examination, you must achieve an overall grade of 80.00 percent or greater, with a 70.00 percent or better on the SRO-only items, if applicable. If you only take the SRO portion of the exam (as a retake or with an upgrade waiver of the RO exam), you must achieve an 80.00 percent or better to pass. SRO-upgrade applicants who do take the RO portion of the exam and score below 80.00 percent on that part of the exam can still pass overall but may require remediation. Grades will not be rounded up to achieve a passing score. Every question is worth one point.
3. For an initial examination, the nominal time limit for completing the RO examination is six hours, the 25-question, SRO-only exam is three hours, the combined RO/SRO exam is eight hours.
4. You may bring pens, pencils, and calculators into the examination room; programable memories must be erased. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.

5. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.
6. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.
7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or training references, you should answer the question based on the *actual plant*.
8. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.
9. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. The scrap paper will be disposed of immediately after the examination.
10. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.
11. Do you have any questions?

QUESTION: 001 (1.00)

Unit 1 reactor tripped at 0800. It is currently 0820 and the following conditions exist:

- Bistable light 44178:0101, INTRM RNG P6 BLOCKED is ON
- Bistable light 44178:0201, INTRM RNG P6 BLOCKED is OFF
- Intermediate range channel N35 indicates 5×10^{-9} amps
- Intermediate range channel N36 indicates 1×10^{-11} amps

What is the cause of these indications and what action or verification is required?

- a. N35 is undercompensated.
Manually energize N31 and N32 using the control board switches.
- b. N36 is undercompensated.
Verify N31 and N32 automatically energize when N35 reaches 1×10^{-11} amps.
- c. N35 and N36 are both undercompensated.
Manually energize N31 and N32 using the control board switches.
- d. N36 is overcompensated.
Verify N31 and N32 automatically energize when N35 reaches 1×10^{-10} amps.

QUESTION: 002 (1.00)

Given the following conditions:

- Pressurizer PORV PCV-431C failed open and cannot be closed.
- Unit 1 reactor automatically tripped on Low Pressurizer Pressure.
- SI has automatically actuated.
- The RO has taken CS-46263 to CLOSE to isolate the failed open PORV.
- Associated alarms have been reset or acknowledged.
- Control board indications are as shown.

What is the status of MV-32195, PRZR RELIEF ISOLATION?

- a. Open
- b. Partially Open
- c. Closed
- d. Cannot be determined

QUESTION: 003 (1.00)

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

- Spent Fuel Pool Cooling is aligned to Unit 1.
- 11 CC Surge Tank level is 8" and trending up from 3".
- 21 CC Surge Tank is 3" and slowly rising.
- 1R-39 CC SYSTEM LIQUID MONITOR radiation levels are increasing.
- 2R-39 CC SYSTEM LIQUID MONITOR radiation levels are normal and stable.

These conditions describe the results of a leak in the ...

- a. 121 Spent Fuel Pool Heat Exchanger
- b. 11 RHR Heat Exchanger
- c. 11 Seal Water Return Heat Exchanger
- d. 11 Letdown Heat Exchanger

QUESTION: 004 (1.00)

Given the following conditions:

- A large break LOCA has occurred on Unit 1.
- RCS pressure is 125 psig and decreasing.
- Containment pressure is 20 psig and increasing.
- No manual actions have been taken since the unit trip.
- 1E-0 "Reactor Trip or Safety Injection", Attachment L "SI Alignment Verification" is being performed.
- The "SI NOT READY", "SI ACTIVE", and "CONTAINMENT ISOLATION" panel status lights are as shown.

Which set of operator actions will complete the first three substeps of Step 1 of Attachment L?

- a. Manually actuate Safety Injection using either control board switch, and manually actuate containment spray.
- b. Manually start and/or align Train "B" SI components, and manually actuate containment spray.
- c. Manually actuate Safety Injection using either control board switch, and close instrument air to containment isolation valves.
- d. Manually actuate Containment Isolation using the Train "B" control board switch, and close instrument air to containment isolation valves

QUESTION: 005 (1.00)

Given the following conditions:

- CVCS is in a normal 2-pump, 1-orifice alignment
- 11 Charging Pump is in AUTO, 12 Charging Pump is in MANUAL

The following conditions are then noted:

- Unit 1 Pressurizer level is decreasing slowly
- VCT level is rising
- RCP seal injection flow is 3.0 gpm per pump

The following alarms are received:

47015:0203 CHARGING PUMP IN AUTO HI/LO SPEED
47015:0206 11 RCP LABYRINTH SEAL LO Δ P
47015:0207 12 RCP LABYRINTH SEAL LO Δ P

- 11 Charging Pump controller output is 100%
- 12 Charging Pump controller output is 0%

Which of the following has occurred?

- a. Charging pump in AUTO varidrive failed to minimum speed
- b. Charging pump in MANUAL controller failed to minimum speed
- c. Controlling Pressurizer Level channel failure LOW
- d. Seal Injection Line has developed a leak

QUESTION: 006 (1.00)

Given the following conditions:

- Unit 1 is in Reduced Inventory with Train 'A' RHR providing shutdown cooling
- RHR inlet temperature is 120°F

The following indications are then noted:

- RCS ultrasonic level is 12 inches and decreasing rapidly
- 11 RHR flow has decreased from 1000 gpm to near zero and is fluctuating
- 11 RHR pump amps are low and fluctuating

What action must FIRST be taken to mitigate these conditions?

- a. Start 12 RHR pump.
- b. Stop 11 RHR pump.
- c. Start a charging pump at maximum flow.
- d. Direct the rover to vent 11 RHR pump.

QUESTION: 007 (1.00)

Given the following conditions on Unit 1:

- The reactor has tripped and SI has actuated
- 12 CC HX outlet temperature is 125°F and rising
- No operator actions have occurred

These conditions indicate that 12 CCHX cooling water...

- a. outlet CV did not fail open on Train B SI.
- b. inlet MV did not open on 12 CC pump start.
- c. inlet MV did not open on Train B SI.
- d. outlet CV did not fail open on 12 CC pump start.

QUESTION: 008 (1.00)

Given the following:

- Unit 1 is at 100% power.
- All systems are in a normal automatic alignment.
- Pressurizer pressure control is in the 4-3 (yellow-blue) position.
- Yellow Pressurizer pressure channel (PT-449) fails AS IS.
- Blue Pressurizer pressure channel (PT-431) fails HIGH.

With no operator action, what is the plant response to this condition?

- a. ALL back-up heaters in auto ENERGIZE, BOTH spray valves go full CLOSED, over time the reactor TRIPS on high pressurizer pressure.
- b. ALL back-up heaters in auto ENERGIZE, BOTH spray valves go full CLOSED, and RCS pressure cycles at the Pressurizer PORV setpoint.
- c. Group C heaters go to minimum current, BOTH spray valves go full OPEN, the reactor TRIPS on low pressurizer pressure, SI does NOT actuate.
- d. Group C heaters go to minimum current, BOTH spray valves go full OPEN, the reactor TRIPS on low pressurizer pressure, SI automatically actuates.

QUESTION: 009 (1.00)

Given the following conditions:

- Unit 1 is experiencing an ATWS
- The operators are performing their immediate actions.
- The RO is manually inserting control rods.
- The Lead has reported that Step 2 of 1FR-S.1 has been completed.
- Turbine control panel indications are as shown.

What action did the Lead RO perform to satisfactorily complete Step 2, "Verify Turbine Trip"?

- a. Verified both turbine stop valves CLOSED.
- b. Manually tripped the turbine and verified UNIT TRIP light LIT.
- c. Manually closed the control valves.
- d. Manually closed the MSIVs and bypass valves.

QUESTION: 010 (1.00)

For a given steam line rupture size and location, which one of the following sets of initial conditions will result in the SMALLEST reactivity addition rate IMMEDIATELY following the rupture?

- a. Middle of core life, RCS Tavg at 547°F
- b. Middle of core life, RCS Tavg at 350°F
- c. End of core life, RCS Tavg at 547°F
- d. End of core life, RCS Tavg at 350°F

QUESTION: 011 (1.00)

Which of the following Control Room controls or indications will remain usable following a loss of power to all 4160V buses?

- a. Individual Rod Position Indication (IRPI)
- b. RCP Seal Injection Flow Meters
- c. Aux FW Outlet MOV control switches
- d. Steam Generator PORV Controllers

QUESTION: 012 (1.00)

Given the following conditions:

- A Loss of Offsite Power occurred five minutes ago with a concurrent loss of ERCS.
- Pressurizer pressure is 2085 psig
- Tcold is 548°F
- Tavg is 560°F
- Thot is 573°F
- Average core exit thermocouple temperatures are 583°F

What is the current amount of RCS subcooling?

- a. 60°F
- b. 70°F
- c. 83°F
- d. 95°F

QUESTION: 013 (1.00)

Given the following conditions:

- 21 SG has ruptured.
- The crew has completed actions in 2E-3 "Steam Generator Tube Rupture" and is now performing 2ES-3.1, "Post-SGTR Cooldown Using Backfill."
- A cooldown has been established at 80°F/hr.
- RCS pressure is 900 psig and lowering.
- RCS temperature is 495°F
- 21 SG NR level is 25% and lowering.
- Pressurizer level is 50% and stable.

The step currently being performed will depressurize the RCS using normal pressurizer spray in order to...

- a. refill the pressurizer using safety injection flow.
- b. stop the current water transfer from the RCS to the ruptured SG.
- c. reduce subcooling to minimum to allow SI flow to be stopped earlier.
- d. increase the water transfer rate from the ruptured SG to the RCS.

QUESTION: 014 (1.00)

Given the following conditions:

- Unit 1 has experienced a Reactor Trip with Loss of Offsite Power
- Buses 15 and 16 are powered by D1 and D2
- Train B DC power is lost.
- You are investigating the loss of DC power using 1C20.9AOP2 "Loss of Train B DC"
- The Turbine Building Operator brings you Attachment A of 1C20.9 AOP4 "Failure of 12 Battery Charger"

What failures have occurred to cause the loss of Train B DC?

- a. 12 Battery Charger has lost AC input power and the 12 Battery Fuse has blown.
- b. 12 Battery Charger has lost AC input power and the 12 Battery Disconnect Switch has automatically tripped open.
- c. 12 Battery Charger has failed to restart and the 12 Battery Fuse has blown.
- d. 12 Battery Charger has failed to restart and the 12 Battery Disconnect Switch has automatically tripped open.

QUESTION: 015 (1.00)

Which components ensure that the ultimate heat sink for reactor safety is maintained for the long term following a design basis earthquake?

- a. Emergency Pump Bay, emergency intake piping and Safeguards Traveling Screens.
- b. Intake Screenhouse Traveling Screens and Bypass Gates.
- c. Plant Screenhouse Traveling Screens and Emergency Bay Sluice Gate.
- d. Condensate Storage Tanks and Auxiliary Feedwater System.

QUESTION: 016 (1.00)

ECA-1.2 "LOCA Outside Containment" directs actions to verify valve positions for only ONE system. This system is the most likely location for a LOCA outside containment.

What system is addressed by ECA-1.2?

- a. Residual Heat Removal.
- b. Chemical and Volume Control.
- c. Component Cooling.
- d. Safety Injection.

QUESTION: 017 (1.00)

Given the following conditions:

- Unit 1 was at 100% power when a reactor trip and safety injection occurred
- The crew has transitioned to 1FR-H.1, "Response to Loss of Secondary Heat Sink."
- While attempting to restore AFW, the following conditions are noted:

47010:0107 12 AFWP LOCKOUT is in alarm
11 SG pressure is 75 psig and lowering
12 SG pressure is 800 psig and slowly lowering.
CST levels are 100,000 gallons each

Which cause below explains the above indications and will allow a restart of 12 AFWP from the control room per the Alarm Response Procedure?

- a. Bus Load Rejection
- b. Electrical overcurrent trip
- c. Low suction pressure trip
- d. Low discharge pressure trip

QUESTION: 018 (1.00)

Unit 1 operators are attempting to place ECCS in Sump B recirculation following a LOCA.

Which of the following would PREVENT any recirculation flow from being established unless corrected?

- a. RCS pressure is 475 psig
- b. 11 SI pump suction isolation MV from the RWST open
- c. Both SI pump test line to RWST MVs open
- d. RHR Return to Loop B isolation MV closed

QUESTION: 019 (1.00)

Given the following conditions:

- Unit 2 Reactor Power is 75% and increasing
- PRZR pressure is slowly increasing
- PRZR level is increasing
- T_{avg} is increasing
- All control systems are in AUTO

What event is occurring?

- a. A Pressurizer PORV is leaking to the PRT.
- b. A Turbine Runback is in progress.
- c. A Loop A T_{avg} circuit is drifting high.
- d. Control Bank D is continuously withdrawing.

QUESTION: 020 (1.00)

The Unit 1 RO notes the following conditions at 95% power:

- 47013-0407 ROD AT BOTTOM is in alarm
- RCS temperature - DECREASING
- Reactor power - DECREASING
- Audible control rod motion

The cause of the above is _____ and the required response is to _____.

- a. an uncontrolled insertion of control rods; reduce turbine power to match Tavg and Tref and verify rod motion stops.
- b. an uncontrolled insertion of control rods; take rod control to MANUAL and trip the reactor if rods continue motion.
- c. a dropped control rod; allow the unit to stabilize and apply COLR insertion limits for a single bottomed rod.
- d. a dropped control rod; manually trip the reactor and go to 1E-0 "Reactor Trip or Safety Injection."

QUESTION: 021 (1.00)

Given the following conditions:

- Boration at the maximum available rate is required by plant conditions
- CV-31328 REGEN HX CHG LINE OUTL has failed closed
- One charging pump is running at minimum speed
- BA flow controller is set at 90% in MANUAL

Based on these conditions, which action is required after initiation of normal boration?

- a. Raise running charging pump speed to 25% in MANUAL.
- b. Set the Boric Acid flow controller to 0% in MANUAL.
- c. Set the Boric Acid controller to 75% in MANUAL.
- d. Set the Boric Acid controller to 100% in MANUAL.

QUESTION: 022 (1.00)

A normal reactor startup is in progress with the reactor approaching criticality when the Instrument AC bus powering Source Range Channel N31 is lost.

Which of the following correctly states the highest priority alarm received and the procedure required to be used?

- a. 47013-0401 SOURCE RANGE LOSS OF DETECTOR VOLTAGE, C51 Instrument Failure Guide.
- b. 47013-0407 ROD AT BOTTOM, E-0 "Reactor Trip or Safety Injection."
- c. 47013-0407 ROD AT BOTTOM, C1.3 "Unit Shutdown."
- d. 47014-0301 SOURCE RANGE BLOCKED HI VOLT OFF, C51 Instrument Failure Guide.

QUESTION: 023 (1.00)

Given the following conditions:

- Fuel handling is in progress at the Spent Fuel Pool (SFP) area with both units at power.
- A fuel assembly is dropped.
- R-25 SPENT FUEL POOL AREA MONITOR A is NOT in alarm.
- R-31 SPENT FUEL POOL AREA MONITOR B is NOT in alarm.

How is SFP Special Ventilation (SFPSVS) placed in service when directed by the SS?

- a. Direct the duty chemist or radiation protection to locally bug R-25 and R-31.
- b. Manually, using 121 and 122 SFPSVS control board switches.
- c. Raise the test current signal to R-25 and R-31 at the radiation monitor racks.
- d. Locally open the dampers from the SFP to 121 and 122 SFPSVS fans.

QUESTION: 024 (1.00)

Given the following conditions:

- Fuel handling is in progress in Containment and the Spent Fuel Pool (SFP).
- Radiation Monitor R-5 SPENT FUEL POOL AREA MONITOR fails LOW
- All other radiation monitors are operable.

What is the impact of this failure?

- a. Fuel handling in the SFP and Containment must be stopped.
- b. Fuel handling in the SFP ONLY must be stopped.
- c. None provided R-25 SPENT FUEL POOL AREA MONITOR A is operable.
- d. None provided R-28 NEW FUEL PIT AREA CRITICALITY MONITOR is operable.

QUESTION: 025 (1.00)

The control room is evacuated per F5 Appendix B, "Control Room Evacuation - Fire".

When charging flow is restored, 12 Charging Pump speed will be . . .

- a. controlled from the Train A Hot Shutdown Panel
- b. controlled from outside the 12 Charging Pump room
- c. controlled from inside the 12 Charging Pump room
- d. controlled from the Train B Hot Shutdown Panel.

QUESTION: 026 (1.00)

When responding to a Unit 1 Small Break LOCA in 1ES-1.1 "Post-LOCA Cooldown and Depressurization," one RHR train is realigned for shutdown cooling per Attachment D while the other continues to inject from the RWST.

Which RHR train is aligned for shutdown cooling FIRST and why?

- a. Train A; RHR discharge relief to PRT is located on RHR Train A.
- b. Train B; Train B RHR return is to Loop B Cold Leg only.
- c. Train A; Train A RHR suction is from Loop A Hot Leg only.
- d. Train B; Train B RHR suction relief is on RHR Train A.

QUESTION: 027 (1.00)

Given the following conditions:

- Large Break LOCA is in progress
- Containment pressure is 29 psig and stable
- You notice an ORANGE condition on CONTAINMENT CSF due to Sump B level above 8 feet.

What action will be directed by FR-Z.2, "Response to High Sump B Level", and what is the concern if actions in FR-Z.2 are not successful?

- a. Divert RHR flow from Sump B to the RWST to maintain level below 8 feet. High water levels could result in critical components needed for plant recovery being damaged and rendered inoperable.
- b. Align containment sump discharges to the annulus to maintain level below 8 feet. Water levels could reach the bottom of the reactor vessel resulting in thermal shock and vessel failure.
- c. Identify and isolate the source of excess water using control board indications and Sump B samples. High water levels could result in critical components needed for plant recovery being damaged and rendered inoperable.
- d. Stop both containment spray pumps. Water levels could reach the bottom of the reactor vessel resulting in thermal shock and vessel failure.

QUESTION: 028 (1.00)

During preparations to start a reactor coolant pump (RCP), the bearing oil lift pump is started.

Interlocks needed to start the RCP will be satisfied ...

- a. when the amber light on the RCP control switch is LIT, indicating the Large Motor Monitor is satisfied.
- b. when the amber light on the Oil Lift Pump control switch is LIT, indicating oil lift pressure is >350psig.
- c. when the amber light on the Oil Lift Pump control switch is LIT, indicating two minutes have elapsed since the oil lift pump start.
- d. when the amber light on the RCP control switch is LIT, indicating the Oil Lift Pump is running.

QUESTION: 029 (1.00)

Given the following conditions:

- A second 40 gpm letdown orifice has just been placed in service
- VCT level is at 48%
- The operator inadvertently leaves both charging pumps in MANUAL with 40 gpm charging flow to the regen HX

What is the expected response of the VCT level control system to the level change?

VCT level will . . .

- a. decrease to 17% when auto make-up will start.
- b. decrease to 28% when auto make-up will start.
- c. increase to 56% when letdown flow will begin to divert to the CVCS HUT.
- d. increase to 78% before letdown flow will divert to the CVCS HUT.

QUESTION: 030 (1.00)

Given the following conditions:

- Unit 1 in MODE 4, HOT SHUTDOWN
- Both RHR pumps are running
- RCS heat-up rate is 50°F per hour during performance of 1C1.2, Unit 1 Startup.
- The air supply line to 11 RHR heat exchanger outlet valve CV-31235 is broken off.

As a result of the loss of air, the control valve will fail . . .

- a. OPEN. The bypass flow control valve will throttle closed and RCS heat-up rate will decrease.
- b. CLOSED. The bypass flow control valve will throttle open and the RCS heat-up rate will increase.
- c. OPEN. The 12 RHR heat exchanger outlet valve will throttle closed to maintain RCS heat-up rate.
- d. CLOSED. The 12 RHR heat exchanger outlet valve will throttle open to maintain the RCS heat-up rate.

QUESTION: 031 (1.00)

Given the following conditions:

- A reactor trip and SI with loss of offsite power occurred.
- All equipment operates as designed.
- Pressurizer pressure drops to 1750 psig, then recovers one minute later to 2250 psig
- Pressurizer level has increased to 48%
- RCS cold leg temperatures are 545°F and stable
- RCS hot leg temperature is 582°F and slowly decreasing
- Both SG's are at 1005 psig controlled by the SG PORVs
- Offsite power is now available and non-safeguard buses have been energized.
- Twenty minutes has elapsed since the reactor trip.
- SI has been terminated per ES-0.2, "SI Termination."
- Step 24 of ES-0.2 directs the start of one RCP.

What is the impact of the above conditions on RCP restart?

- a. The RCP can be started, natural circulation flow has been established and has removed the cold ECCS water from the cold legs.
- b. The RCP can be started, natural circulation flow has NOT been established but ECCS flow did not occur to the RCS.
- c. RCP restart is not allowed, the reactivity addition from cold ECCS water in the RCS cold legs could result in reactor restart.
- d. RCP restart is not allowed, the RCS will overpressurize upon RCP restart when cold ECCS water is heated.

QUESTION: 032 (1.00)

Given the following conditions:

- A Unit 2 reactor trip and safety injection has occurred.
- While verifying containment isolation, you identify that the lights for the following valves are NOT lit:

CV-31344, PRT TO GAS ANAL ISOL

CV-31345, PRT TO GAS ANAL ISOL

The RO must close these valves by taking the control board switches to CLOSE on the _____, and if this is unsuccessful, dispatch an operator to the _____ to locally close the air supply to the valves.

- a. RCS panel (panel C), Hot Lab Sample Room
- b. RCS panel (panel C), 715' Aux Building penetration area behind SGB Flash Tank.
- c. Containment Isolation/Waste Disposal panel (panel B), Hot Lab Sample Room
- d. Containment Isolation/Waste Disposal panel (panel B), 715' Aux Building Valve Gallery

QUESTION: 033 (1.00)

Given the following plant conditions:

- PRZR RELIEF TANK HI TEMP/LVL/PRESS OR LO LVL is in alarm
- PRT Pressure is 28.5 psig and increasing
- PRT Temperature is 120°F and stable
- PRT level is 71.5% and stable

What is causing the pressure rise, what must be done, AND what is the implication of the pressure rise?

- a. Nitrogen addition valve is leaking by and must be isolated; the PRZR safety valves will relieve at the same pressure as before.
- b. Pressurizer PORV or safety is leaking by and must be isolated if possible; the PRZR safety valves will relieve at a lower pressure than before.
- c. Pressurizer PORV or safety is leaking by and must be isolated if possible; the PRZR safety valves will relieve at a higher pressure than before.
- d. Nitrogen addition valve is leaking by and must be isolated; the PRZR safety valves will relieve at a lower pressure than before.

QUESTION: 034 (1.00)

Given the following conditions:

- 11 Component Cooling (CC) pump was in service with 12 CC pump in standby
- Bus 15 ONLY loses offsite power
- 8 seconds later, Bus 15 is energized from D1

What is the final status of Unit 1 CC pumps and why?

- a. Both CC pumps are in operation as both received start signals due to low CC header flow.
- b. Both CC pumps are in operation as both received start signals due to low CC header pressures.
- c. 12 CC pump is running after an autostart on low pressure, and 11 CC pump is not running as 12 CC pump start raised pressure above the autostart setpoint.
- d. 12 CC pump is running after an autostart on low header flow, and 11 CC pump is running as its control switch in "Normal after start" provides a start signal.

QUESTION: 035 (1.00)

Given the following conditions:

- Unit 1 is at 100% power
- Pressurizer PORV PCV-431C opens and sticks open.
- The associated PORV block valve cannot be closed
- PRT pressure rises to the point that the PRT Rupture Disc ruptures

What is the effect of the disc rupturing?

- a. N2 header pressure lowers.
- b. Pressurizer PORV outlet temperature lowers.
- c. Reactor makeup to the PRT initiates.
- d. PRT level drains below the sparging nozzles.

QUESTION: 036 (1.00)

What reactor protection system trip(s) serves as a BACK-UP to the Power Range Neutron Flux - High Trip, and is designed to ensure that the allowable heat generation rate (kw/ft) of the fuel is NOT exceeded?

- a. Pressurizer High Pressure
- b. Overpower ΔT
- c. Overtemperature ΔT
- d. Pressurizer low pressure

QUESTION: 037 (1.00)

Given the following conditions:

- You are the oncoming Reactor Operator.
- An RCS cooldown is in progress in accordance with 1C1.3 "Unit 1 Shutdown."
- One RO is controlling the cooldown with the steam dump controller in MANUAL and AFW flow control to the SGs.
- Another RO is controlling RCS pressure with manual spray flow and heaters.
- SI was blocked at 0420.
- The last hour's cooldown log shows:

Time	RCS Temperature	Pzr WaterTemp	Pzr Vapor Temp	RCS Pressure
0430	530	633	633	1905
0445	525	639	639	2035
0500	511	637	637	2005
0515	487	629	629	1885

If trends from 0500 to 0515 continue until 0530 with no other operator action, which of the following will result?

- a. RCS cooldown limits will be violated.
- b. Safety injection will automatically actuate.
- c. Pressurizer cooldown limits will be violated.
- d. Subcooling will go below the 50°F limit.

QUESTION: 038 (1.00)

Given the following conditions:

- Both units at 100% power
- Chilled water is aligned to all fan coil units (FCUs) and CRDM cooling units
- Unit 2 experiences a Safety Injection.

What is the cooling lineup for Unit 1 and Unit 2 as a result?

	Unit 1 FCUs	Unit 1 CRDM Clg	Unit 2 FCUs	Unit 2 CRDM Clg
a.	Cooling Water	Isolated	Chilled Water	Chilled Water
b.	Chilled Water	Chilled Water	Cooling Water	Isolated
c.	Chilled Water	Chilled Water	Chilled Water	Chilled Water
d.	Cooling Water	Isolated	Cooling Water	Isolated

QUESTION: 039 (1.00)

Which Train B Containment Spray component will NOT operate as required during a Large Break LOCA if Bus 121 is deenergized?

- a. RWST to 12 CS Pump valve.
- b. 12 Caustic Addition valve.
- c. 12 CS Test Line Recirc valve to RWST.
- d. 12 Containment Spray Discharge valve.

QUESTION: 040 (1.00)

How is Containment Spray operated during a Large Break LOCA?

Running with suction from the...

- a. RWST and Caustic Addition standpipe, then stopped when directed by ES-1.2 "Transfer to Recirculation."
- b. RWST and Caustic Addition standpipe until the RWST is depleted, then suction is transferred to RHR recirculation until containment pressure is below 4 psig.
- c. RWST until RWST level is 33% and then stopped.
- d. RWST until containment pressure is less than 20 psig, then stopped.

QUESTION: 041 (1.00)

Given the following conditions on Unit 1:

- 1E-0 "Reactor trip or Safety Injection" is in progress, immediate actions have just been completed.
- Containment pressure is 14 psig and rising
- SG pressures are 980 psig and lowering for 11 SG, 310 psig and lowering for 12 SG
- SG steam flows are 0 lbm/hr for 11 SG, 1.5E6 lbm/hr for 12 SG
- RCS temperature is 525°F and decreasing at 220°F/hr
- Both MSIVs indicate OPEN

Which statement is correct for the above conditions?

- a. Both MSIVs failed to close automatically, 12 MSIV non-return check valve has CLOSED to isolate 11 SG from the break location.
- b. Both MSIVs failed to close automatically, 11 MSIV non-return check valve has CLOSED to isolate 11 SG from the break location.
- c. 12 MSIV ONLY failed to close automatically, 11 MSIV non-return check valve has CLOSED to isolate 11 SG from the break location.
- d. 12 MSIV ONLY failed to close automatically, 12 MSIV non-return check valve has CLOSED to isolate 11 SG from the break location.

QUESTION: 042 (1.00)

Given the following conditions:

- Unit 1 is at 85% power on a load increase from 50% power.
- 11/12 Condensate Pumps and 11/12 FW Pumps are in service with 13 Condensate Pump in standby.
- Condenser Level decreases to -26".
- All equipment operates as designed.

What is the effect on the plant, and what operator actions should be taken?

- a. 13 Condensate Pump starts and 11 Feedwater Pump ONLY trips; commence a rapid load reduction to <60% power.
- b. Both Feedwater Pumps will trip; verify the reactor is tripped and perform immediate actions of 1E-0.
- c. 13 Condensate Pump starts and the Condensate Subcooling valve to the FWP suction opens; verify both MFPs are running with adequate suction pressure.
- d. Both Feedwater Pumps will trip; manually trip the reactor and perform immediate actions of 1E-0.

QUESTION: 043 (1.00)

C28.3 "Condensate System" contains a prerequisite to ensure the feedwater pump auxiliary lube oil pumps are operating when the condensate pumps are running and a flowpath is OPEN through the feedwater pumps.

The reason for this prerequisite is to:

- a. Electrically enable the feedwater pumps to start.
- b. Minimize the effects of cold seal water on FW pump bearings.
- c. Ensure feedwater pump oil is up to operating temperature prior to starting the FW pumps.
- d. Prevent damage to the FW pumps due to condensate flow spinning the pumps.

QUESTION: 044 (1.00)

Given the following conditions:

- Unit 1 is at 100% power
- A Heater Drain pump trips
- Feedwater Pump Suction Pressure drops to 180 psig for 2 seconds before recovering to 350 psig.
- The standby Heater Drain pump has started

Which of the following describes ALL of the automatic changes to the Condensate and Feedwater alignment the RO expects to see based on the above conditions?

- a. The standby Condensate Pump has started.
- b. Both Feedwater Pumps are tripped, two Condensate Pumps are running, and CV-31087 COND BP TO 11/12 FWP has opened.
- c. Both Feedwater Pumps are tripped and the standby Condensate Pump has started.
- d. The standby Condensate Pump has started and CV-31087 COND BP TO 11/12 FWP has opened.

QUESTION: 045 (1.00)

An air line break results in CV-31998, 11 TURBINE DRIVEN AUX FEEDWATER PUMP STEAM BLOCK VALVE, failing OPEN and starting 11 AFWP.

What is the effect of this failure?

- a. Low suction and discharge pressure trip protection is no longer available.
- b. CV-31153 11 TD AUX FW PUMP RECIRCULATION VALVE will not OPEN on pump start.
- c. Turbine overspeed protection is no longer available.
- d. No light indication is available for control board switch CS-46424, 11 TD AFWP.

QUESTION: 046 (1.00)

With the unit in MODE 5 COLD SHUTDOWN, which of the following is the MINIMUM electrical power source combination that will satisfy LCO 3.8.2, "AC Sources - Shutdown"?

- a. Two offsite power sources and one safeguards diesel generator.
- b. Any combination of two offsite power sources or safeguards diesel generators.
- c. One offsite power source and one safeguards diesel generator.
- d. One safeguards diesel generator.

QUESTION: 047 (1.00)

What is the condition of 11 and 12 Batteries?

- a. 11 Battery is being charged at a rate of 38.6 amps;
12 Battery is being charged at a rate of 0.2 amps.
- b. 11 Battery is discharging at a rate of 38.6 amps;
12 Battery is being charged at a rate of 0.2 amps.
- c. 11 Battery is discharging at a rate of 38.6 amps;
12 Battery is discharging at a rate of 18.5 amps.
- d. 11 Battery is being charged at a rate of 38.6 amps;
12 Battery is discharging at a rate of 18.5 amps.

QUESTION: 048 (1.00)

A loss of Unit 1 Train "A" DC has occurred from 100% power.

DC control power to bus 11 and 12 breakers...

- a. is lost for Bus 11 and Bus 12 remains powered from DC panel 21
- b. is lost for Bus 11 and Bus 12 remains powered from DC panel 12
- c. switches automatically to DC panel 12 for buses 11 and 12
- d. switches automatically to DC panel 21 for buses 11 and 12

QUESTION: 049 (1.00)

D5 Emergency Diesel Generator is being operated in parallel to the grid on Bus 25.

- Load has been increased to the desired value.
- Voltage is adjusted as follows using CS-46949, D5 DSL GEN EXCITER CONTROL:

Taken to RAISE and D5 generator amps increase.

Taken to LOWER until D5 generator amps stop decreasing and then start to increase

Taken to RAISE until D5 generator amps increase

Prior to the first adjustment, D5 was _____ VARS and after the third adjustment was _____ VARS.

- a. delivering, delivering
- b. delivering, receiving
- c. receiving, delivering
- d. receiving, receiving

QUESTION: 050 (1.00)

Procedure C21.1-5.13, "Releasing 123 CVCS Monitor Tank to the River" is brought to the control room and a test of R-18 WASTE LIQUID DISPOSAL LIQUID EFFLUENT MONITOR is required.

How is the detector normally checked for proper operation by the RO?

- a. The Reactor Operator takes the OPERATIONAL SELECTOR switch at the radiation monitor panel to "CHECK SOURCE" and verifies reading is within expected range.
- b. The Reactor Operator takes the OPERATIONAL SELECTOR switch at the radiation monitor panel to "PULSE CAL" and verifies reading is within expected range.
- c. The detector is locally bugged by the Duty Chemist or Radiation Protection and the RO verifies the reading is within the expected range.
- d. The Reactor Operator administratively verifies R-18 response is correct by referring to the calibration curves in the control room and background radiation levels.

QUESTION: 051 (1.00)

Given the following conditions:

- All electric power buses on both units are in their normal power alignments.
- 121 Cooling Water Pump is NOT aligned as a safeguards pump.

The power supply to 121 Cooling Water Pump is supplied from 4KV Safeguards Bus:

- a. 15
- b. 16
- c. 25
- d. 26

QUESTION: 052 (1.00)

What is the function and operation of MV-32318 on Fig B34-1?

- a. Supplies the instrument air header from station air compressors when manually opened, and automatically closes if station air pressure is below 85 psig.
- b. Supplies the instrument air header from station air compressors, automatically opens if instrument air pressure is below 85 psig.
- c. Supplies the station air header from instrument air compressors when manually opened, and automatically closes if instrument air pressure is below 85 psig.
- d. Supplies the station air header from instrument air compressors, automatically opens if station air header pressure is below 85 psig.

QUESTION: 053 (1.00)

Given the following conditions:

- 123 Instrument Air Compressor is running in PREFERRED.
- The LOCAL/REMOTE switch is taken to LOCAL.

What will occur with the air compressor?

- a. The compressor stops running, and the control room retains light indication for the compressor.
- b. The compressor stops running unless the local switch is in START, and a control room alarm is received for the compressor in LOCAL.
- c. The compressor continues running until locally stopped, and the control room retains light indication for the compressor.
- d. The compressor continues running unless it is unloaded for 10 minutes, and a control room alarm is received for the compressor in LOCAL.

QUESTION: 054 (1.00)

Given the following conditions:

- Unit 1 is in MODE 1, Power Operation
- You are an extra Reactor Operator assigned to perform SP1032A, Safeguards Logic Test at Power - Train A
- ESF actuation circuitry for Train A is in TEST
- A Large Break LOCA occurs and containment pressure rises to 32 psig

Train 'A' Containment Isolation...

- a. must be manually actuated using the control board CI switch.
- b. will actuate automatically if SI is manually actuated using the control board SI switch.
- c. must be manually actuated using the control board switch after SI is reset.
- d. will actuate automatically as Train A SI will automatically actuate.

QUESTION: 055 (1.00)

Which of the following situations violates precautions or limitations for fuel handling in containment per D5.2 "Refueling Operations?"

- a. RHR inlet temperature rises from 110°F to 120°F as fuel is loaded.
- b. A valve is removed resulting in an opening from containment to the shield building.
- c. One of the two available RHR trains is taken OOS for maintenance.
- d. N32 Source Range detector and N52 Neutron Flux Monitor ONLY are OOS.

QUESTION: 056 (1.00)

The Reactor Operator notes the following concurrent indications:

- Reactor power is 50% and rising.
- Tavg is 557°F and stable.
- Tref is 554°F and stable.
- RCS pressure is 2250 psig and rising.
- The Rod Control System is functioning as designed.

What automatic rod control demand direction and speed is expected to be seen as a result of the above indications?

- a. Rods moving IN at 8 steps per minute.
- b. Rods moving IN at more than 8 steps per minute.
- c. Rods moving OUT at 8 steps per minute.
- d. Rods moving OUT at more than 8 steps per minute.

QUESTION: 057 (1.00)

Given the following conditions:

- Unit 1 is at 100.0% power by TPM and NIS.
- 11 Aux Feedwater Pump starts unexpectedly.
- Steady state conditions are reached with NO operator action.

Which of the following describes the changes in Main Feedwater flow and Reactor Power?

- a. Main Feedwater flow is lower, actual reactor power is higher than indicated power.
- b. Main Feedwater flow is lower, indicated reactor power is higher than actual power.
- c. Main Feedwater flow is higher, actual reactor power is lower than indicated power.
- d. Main Feedwater flow is higher, indicated reactor power is lower than actual power.

QUESTION: 058 (1.00)

Given the following conditions:

- Unit 1 at 100% power.
- 11 Charging Pump is running in AUTO, 12 Charging Pump is running in MANUAL.
- CV-31325 LTDN ORIFICE ISOL 40 GPM is OPEN.
- Pressurizer level control is selected to RED-BLUE (1-3) position.
- Pressurizer level transmitter LT-428 (BLUE) fails HIGH.

How will this failure affect the letdown flowpath?

- a. Once actual level decreases to 14%, CV-31266 (LCV-427) LETDOWN LINE ISOL ONLY closes.
- b. Once actual level decreases to 14%, CV-31266 (LCV-427) LETDOWN LINE ISOL and CV-31325 LTDN ORIFICE ISOL 40 GPM both close.
- c. Once actual level decreases to 14%, CV-31255 (LCV-428) LETDOWN LINE ISOL ONLY closes.
- d. CV-31255 (LCV-428) LETDOWN LINE ISOL immediately closes, and CV-31325 LTDN ORIFICE ISOL 40 GPM closes when actual level reaches 14%.

QUESTION: 059 (1.00)

Which of the following NIS channel(s) will be deenergized if Instrument Bus 112 loses power?

- a. N42
- b. N31, N35 and N41
- c. N32, N36 and N42
- d. N42 and N52

QUESTION: 060 (1.00)

Given the following conditions:

- Unit 2 is at 90% power
- Steam generator water level control is in AUTO.
- 22 steam generator (SG) narrow range level channel 2L-472 has been removed from service for calibration.
- A leak develops on 22 SG narrow range level channel 2L-473, and its indicated level immediately drops to 22%.

What is the expected plant response?

- a. The 22 SG feedwater regulating valve will shift to MANUAL control, and feedwater flow indication remains stable.
- b. The feedwater regulating valves for both SGs will shift to MANUAL control, and feedwater flow indication remains stable.
- c. The 22 SG level will be maintained at program level in AUTO by the remaining operable narrow range level channel.
- d. The 22 SG feedwater regulating valve will open further in AUTO to raise SG level from 22% to program level.

QUESTION: 061 (1.00)

Given the following conditions on Unit 1:

- Reactor power is 100%
- PT-485, Turbine 1st Stage Pressure indicates 0 psig
- PT-486, Turbine 1st Stage Pressure indicates 530 psig.
- RCS Tavg is 560°F
- The actions of 1C51.2 "Instrument Failure Guide" have been completed for Turbine Impulse Pressure Channel Failure

What condition will result in AUTOMATIC OPENING of the steam dumps?

- a. PT-484, Steam Header Pressure fails HIGH.
- b. PT-484, Steam Header Pressure fails LOW.
- c. PT-486, Turbine 1st Stage Pressure fails HIGH.
- d. PT-486, Turbine 1st Stage Pressure fails LOW.

QUESTION: 062 (1.00)

Why does D5.2 "Reactor Refueling Operations" allow stopping all operating RHR pumps for up to 1 hour per 8-hour period during the performance of core alterations?

- a. To allow for swapping of RHR trains in service.
- b. To facilitate movement of fuel or core components.
- c. To allow for performance of surveillance tests on the RHR system.
- d. To perform a decay heat calculation to verify Reactor Engineering core performance data.

QUESTION: 063 (1.00)

Victoreen Area monitor 1R-53 UNIT 1 SI PUMP AREA MONITOR detector has failed to zero output. What alarm if any (Control Room or Remote) and associated response procedure will be used to direct the response?

- a. CR alarm 47022-0108 HI RADIATION TRAIN A PANEL ALARM
- b. No alarm, C11 "Radiation Monitoring System"
- c. Local alarm C80001-01 ARM TROUBLE
- d. CR alarm 47022-0208 RAD MONITOR DOWNSCALE FAILURE PANEL ALARM

QUESTION: 064 (1.00)

Given the following conditions:

- Both units are at 100% power.
- 121 and 122 Instrument Air (IA) Compressors trip simultaneously and will not restart.
- 123 IA Compressor auto starts on low air pressure.
- 123 IA Receiver pressure is 65 psig and stable.
- Steady state conditions are reached.

If no operator action other than opening CP-40-7 is taken, what will be the condition of the Unit 1 and Unit 2 Instrument Air Headers?

- a. Unit 1 and 2 air headers are cross-tied and supplied by 123, 124, and 125 air compressors. Both Instrument air dryers are bypassed.
- b. Unit 1 air header is supplied by 124 and 125 air compressors; Unit 2 air header is supplied by 123 air compressor. Both Instrument air dryers are bypassed.
- c. Unit 1 and 2 air headers are cross-tied and supplied by 123, 124, and 125 air compressors. Both Instrument air dryers are in service.
- d. Unit 1 header is supplied by 124 and 125 air compressors; Unit 2 air header is supplied by 123 air compressor. Both Instrument air dryers are in service.

QUESTION: 065 (1.00)

Given the following conditions:

- The fire protection system is in its normal standby lineup.
- A worker cracks open a fire hydrant valve to flush water out of the line.
- Fire header pressure drops to 97 psig then returns to normal when the hydrant valve is closed.
- Expected control room alarms are received.

Which fire pumps are expected to automatically start, and which (if any) pump(s) can be stopped from the control room per the Alarm Response Guide(s)?

- a. 121 Motor Driven and 122 Diesel Driven fire pumps.
Cannot stop either pump from the CR.
- b. 121 Motor Driven pump only.
Cannot stop 121 pump from the CR.
- c. 121 Motor Driven pump only.
121 pump can be stopped from the CR.
- d. 121 Motor Driven and 122 Diesel Driven fire pumps.
121 pump can be stopped from the CR, but 122 pump cannot.

QUESTION: 066 (1.00)

Unit 1 is at 45% power during a load increase from 25% power.

What plant condition below would result in a Technical Specification condition with actions required in 1 hour or less?

- a. RWST level at 75%.
- b. 11 SI Pump breaker locks out during surveillance testing.
- c. 12 Battery Fuse is blown.
- d. PRZR PORV PCV-431C will not open when tested.

QUESTION: 067 (1.00)

Given the following conditions:

- A plant startup is in progress with reactor power at 7%.
- Preparation for turbine rollup is underway.
- HP Turbine First Stage Metal temperature is 170°F.
- The recommended normal operating limits for load change are applicable.

What is the allowable maximum recommended loading rate for the turbine under these conditions?

- a. 0.92%/min
- b. 1.08%/min
- c. 2.36%/min
- d. 2.78%/min

QUESTION: 068 (1.00)

A reactor startup is in progress on Unit 2 after a refueling with the following conditions:

- Power has been stabilized at 10-8 amps for critical data collection.
- ITC is slightly negative.
- AFW flow to 12 SG is increased from 30 gpm to 80 gpm to maintain level.

Power will _____ and the RO will _____.

- a. increase; insert control rods to stabilize reactor power.
- b. increase; allow power to increase to the POAH to avoid using control rods.
- c. decrease; withdraw control rods to stabilize reactor power.
- d. decrease; allow power to decrease to avoid using control rods.

QUESTION: 069 (1.00)

The following occurs for testing of a normally open, motor operated containment isolation valve:

- The valve passed its previous surveillance testing last quarter.
- The surveillance procedure was begun at 0800.
- At 0830, the valve will NOT stroke in the closed direction and the SS is informed of the failure.
- At 0900, the surveillance is completed and logged as UNSAT.

When is the Technical Specification Required Action completion time clock started for the valve inoperability?

- a. At the date and time of the completion of last quarter's surveillance.
- b. At 0800 when the surveillance was begun.
- c. At 0830 when the valve failure is discovered and reported.
- d. At 0900 when the surveillance is logged completed.

QUESTION: 070 (1.00)

Given the following:

- The plant is in MODE 5 during a unit start up.
- The pressurizer is water solid.
- Both RCPs are running.

What operator action is required to be taken to increase RCS pressure?

- a. CLOSE the pressurizer spray valves.
- b. CLOSE a letdown orifice valve.
- c. START a second charging pump.
- d. Throttle CLOSED the letdown pressure control valve.

QUESTION: 071 (1.00)

An operator is preparing to perform a task in a radiation area. The task will take two (2) hours to complete.

There is a radiation source located near the worksite that results in a dose rate of 80 mr/hr to the operator without shielding. Shielding is available, but at the following total dose (includes installation and removal):

Shielding Layer	Total Dose	Shielding factor (DR _{init} /DR _{final})
1st shield	100 mrem	4
2nd shield	40 mrem	4
3rd shield	10 mrem	5

How many shields should be installed per the site's ALARA policy?

- a. None
- b. One
- c. Two
- d. Three

QUESTION: 072 (1.00)

Per F2 "Radiation Safety" and F3-12 "Emergency Exposure," each individual has an administrative dose guideline of (1) _____ mrem TEDE per year. This guideline can be increased to (2) _____ REM for lifesaving missions.

- a. (1) 1000 (2) 5
- b. (1) 1000 (2) 25
- c. (1) 2000 (2) 5
- d. (1) 2000 (2) 25

QUESTION: 073 (1.00)

- Unit 1 has just entered Mode 5, COLD SHUTDOWN, during a refueling outage
- Containment in-service purge system is placed in service for a short term release.

How long can the short term release continue without additional actions?

- a. The release may continue for up to 1 day, after which the pre-release authorization is completed as if fans were stopped and the release becomes a long term release.
- b. The release may continue for up to 8 hours, after which the pre-release authorization is completed as if fans were stopped and the release becomes a long term release.
- c. The release may continue for up to 1 day, after which the system must be shut down until containment air is sampled and the long term pre-release authorization is approved.
- d. The release may continue for up to 8 hours, after which the system must be shut down until containment air is sampled and the long term pre-release authorization is approved.

QUESTION: 074 (1.00)

Given the following conditions:

- A Unit 1 startup is in progress per 1C1.2 "Unit 1 Startup Procedure"
- Reactor power is 6% and stable
- The RO withdraws rods one step.
- Rods continue to step OUT after the RO releases the switch
- The reactor is manually tripped when reactor power reaches 28%
- 1E-0 "Reactor Trip or Safety Injection" is entered

Which of the following is correct regarding these events?

- a. An automatic reactor trip should NOT have occurred, as the Intermediate Range High Flux Trip was manually blocked per procedure at the initial power level.
- b. An automatic reactor trip should have occurred since the 'at-power trips' were enabled when power exceeded the P-7 setpoint.
- c. An automatic reactor trip should NOT have occurred, since the Power Range Trip- Low Setpoint trip setpoint was not reached.
- d. An automatic reactor trip should have occurred, since the Power Range Trip - Low Setpoint was not bypassed and exceeded its reactor trip setpoint.

QUESTION: 075 (1.00)

During which set of conditions below is it appropriate to use ES-0.0 "Rediagnosis?"

During performance of...

- a. FR-S.1 "Response to Nuclear Generation/ATWS" and the reactor is locally tripped.
- b. E-0 "Reactor Trip or Safety Injection" when diagnosis steps are completed and the cause of the SI has not been determined.
- c. E-1 "Response to Loss of Reactor or Secondary Coolant" when operators are unsure if they are in the correct procedure.
- d. ECA-0.0 "Loss of All AC Power" when a steam generator begins to depressurize in an uncontrolled manner and has not been isolated.

(***** END OF EXAMINATION *****)

ANSWER: 001 (1.00)
 a.
 REFERENCE:
 B9A, Nuclear Instrumentation
 System ES-0.1
 Reactor Trip Recovery,
 Step15
 HIGHER
 NEW
 007 EA1.05 ..(KA's)

ANSWER: 002 (1.00)
 c.
 REFERENCE:
 47012-0109 Alarm Response
 HIGHER
 NEW
 008 AA2.05 ..(KA's)

ANSWER: 003 (1.00)
 d.
 REFERENCE:
 C14 AOP2, Leakage Into the
 Component Cooling System
 HIGHER
 MODIFIED
 009 EK3.07 ..(KA's)

ANSWER: 004 (1.00)
 c.
 REFERENCE:
 E-0, Reactor Trip or Safety
 Injection
 HIGHER
 NEW
 011 EA1.04 ..(KA's)

ANSWER: 005 (1.00)
 a.
 REFERENCE:
 47015:0203, 0206 ARPs
 HIGHER
 NEW
 022 AA1.04 ..(KA's)

ANSWER: 006 (1.00)
 b.
 REFERENCE:
 D2 AOP1
 HIGHER
 NEW
 025 2.1.2 ..(KA's)

ANSWER: 007 (1.00)
 b.
 REFERENCE:
 Logic diagram NF-40315-6
 Lesson Plan P8176L-003
 MEMORY
 MODIFIED
 026 AK3.01 ..(KA's)

ANSWER: 008 (1.00)
 d.
 REFERENCE:
 B7 - Reactor Control System
 (Figure B7-14, PZR pressure
 Control System
 HIGHER
 MODIFIED
 2.4.4 027 ..(KA's)

ANSWER: 009 (1.00)
 d.
 REFERENCE:
 FR-S.1, Response to Nuclear
 Generation ATWS Turbine
 Control lesson Plan
 HIGHER
 NEW
 029 EA2.05 ..(KA's)

ANSWER: 010 (1.00)
 b.
 REFERENCE:
 Fundamentals knowledge-
 break flow vs pressure Fig
 C1-12A Pg 2
 HIGHER
 BANK
 040 AK1.05 ..(KA's)

ANSWER: 011 (1.00)
 d.
 REFERENCE:
 1ECA-0.0 steps 17, 21 B20.8
 section 3.3
 MEMORY
 NEW
 055 EA2.04 ..(KA's)

ANSWER: 012 (1.00)
 a.
 REFERENCE:
 B10 p. 10
 HIGHER
 MODIFIED
 056 AK1.03 ..(KA's)

ANSWER: 013 (1.00)
 d.
 REFERENCE:
 2ES-3.1 Step 8 2E-3 Step 17
 MEMORY
 NEW
 038 EK3.06 ..(KA's)

ANSWER: 014 (1.00)
 c.
 REFERENCE:
 1C20.9 AOP4 Failure of 12
 Battery Charger 1C20.9
 AOP2 Loss of Train B DC
 HIGHER
 NEW
 058 AK1.01 ..(KA's)

ANSWER: 015 (1.00)

a.

REFERENCE:

B35 Cooling Water B25
Circulating Water AB-3
Earthquakes USAR Section
10 page 10.4-3

MEMORY

MODIFIED

2.1.28 062 ..(KA's)

ANSWER: 016 (1.00)

a.

REFERENCE:

ECA-1.1 Summary, Step 1

MEMORY

NEW

E04 EK2.2 ..(KA's)

ANSWER: 017 (1.00)

d.

REFERENCE:

C28.1 Auxiliary Feedwater
System B28B Auxiliary
Feedwater System
C47010:0107 Alarm
Response Guide

HIGHER

MODIFIED

E05 EK2.1 ..(KA's)

ANSWER: 018 (1.00)

c.

REFERENCE:

B15

MEMORY

NEW

E11 EK2.1 ..(KA's)

ANSWER: 019 (1.00)

d.

REFERENCE:

C5 AOP 1

HIGHER

BANK

001 AA2.04 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

1C5 AOP4 section 2.4
C47013-0407 ARP 1C5
AOP2 section 2.4

HIGHER

NEW

2.1.23 003 ..(KA's)

ANSWER: 021 (1.00)

c.

REFERENCE:

C12.5

HIGHER

NEW

024 AA1.13 ..(KA's)

ANSWER: 022 (1.00)

b.

REFERENCE:

ARP's Appendix C1B

MEMORY

NEW

2.4.31 032 ..(KA's)

ANSWER: 023 (1.00)

c.

REFERENCE:

D5.1 AOP1

MEMORY

NEW

036 AK2.02 ..(KA's)

ANSWER: 024 (1.00)

b.

REFERENCE:

D5.1 and D5.1 Table 2, D5.2
Appendix A C11, Radiation
Monitoring System

MEMORY

NEW

061 AA2.06 ..(KA's)

ANSWER: 025 (1.00)

c.

REFERENCE:

F5 App B Attachment E, step
L

MEMORY

BANK

068 AA1.06 ..(KA's)

ANSWER: 026 (1.00)

b.

REFERENCE:

ES-1.1 Fig B15-01

MEMORY

NEW

E03 EK3.2 ..(KA's)

ANSWER: 027 (1.00)

c.

REFERENCE:

FR-Z.2, Response to High
Sump B Level

MEMORY

NEW

E15 EK1.3 ..(KA's)

ANSWER: 028 (1.00)

b.

REFERENCE:

C3, Reactor Coolant Pump
B3, Reactor Coolant Pumps

MEMORY

NEW

003 A3.05 ..(KA's)

ANSWER: 029 (1.00)

c.

REFERENCE:

P8172L-001A B12A, CVCS

HIGHER

BANK

004 A3.09 ..(KA's)

ANSWER: 030 (1.00)
 a.
 REFERENCE:
 B15, RHR System
 P8180L-003
 HIGHER
 MODIFIED
 005 K3.01 ..(KA's)

ANSWER: 031 (1.00)
 a.
 REFERENCE:
 B18A, Safety Injection
 System
 HIGHER
 NEW
 006 K5.07 ..(KA's)

ANSWER: 032 (1.00)
 b.
 REFERENCE:
 E-0, Reactor Trip and Safety
 Injection Att L, Step 1, and
 Att. G
 MEMORY
 NEW
 2.1.30 007 ..(KA's)

ANSWER: 033 (1.00)
 a.
 REFERENCE:
 ARP 47012:0406 B4A,
 Reactor Coolant System
 HIGHER
 NEW
 007 A2.02 ..(KA's)

ANSWER: 034 (1.00)
 c.
 REFERENCE:
 B14 Logic NF-40321-1
 Simulator response
 HIGHER
 NEW
 008 K4.09 ..(KA's)

ANSWER: 035 (1.00)
 b.
 REFERENCE:
 Steam Tables
 HIGHER
 BANK
 010 K6.04 ..(KA's)

ANSWER: 036 (1.00)
 b.
 REFERENCE:
 Table B8-1
 MEMORY
 BANK
 012 K5.02 ..(KA's)

ANSWER: 037 (1.00)
 b.
 REFERENCE:
 B18C
 HIGHER
 BANK
 013 A1.01 ..(KA's)

ANSWER: 038 (1.00)
 d.
 REFERENCE:
 Logic Diagram NF-86186-3
 Lesson Plan P8180L-009H
 Containment Ventilation
 MEMORY
 NEW
 022 K1.04 ..(KA's)

ANSWER: 039 (1.00)
 d.
 REFERENCE:
 B18D Load List
 MEMORY
 MODIFIED
 026 K2.02 ..(KA's)

ANSWER: 040 (1.00)
 a.
 REFERENCE:
 ES-1.2 and bases B18D
 MEMORY
 NEW
 026 K4.01 ..(KA's)

ANSWER: 041 (1.00)
 d.
 REFERENCE:
 B27, Main and Auxiliary
 Steam System section 3.8
 HIGHER
 NEW
 039 A4.01 ..(KA's)

ANSWER: 042 (1.00)
 b.
 REFERENCE:
 NF-40310-1, NF-40311-1
 Logic Diagrams
 HIGHER
 MODIFIED
 056 A2.04 ..(KA's)

ANSWER: 043 (1.00)
 d.
 REFERENCE:
 C28.3, Condensate System
 MEMORY
 BANK
 056 K1.03 ..(KA's)

ANSWER: 044 (1.00)
 d.
 REFERENCE:
 B28A
 HIGHER
 NEW
 059 A3.03 ..(KA's)

ANSWER: 045 (1.00)

a.

REFERENCE:

Logic NF-40312-1

HIGHER

NEW

061 K6.01 ..(KA's)

ANSWER: 050 (1.00)

a.

REFERENCE:

C21.1-5.13

MEMORY

NEW

073 A4.02 ..(KA's)

ANSWER: 055 (1.00)

b.

REFERENCE:

D5.2 Precaution 3.1

MEMORY

NEW

103 K3.03 ..(KA's)

ANSWER: 046 (1.00)

c.

REFERENCE:

LCO 3.8.2

MEMORY

NEW

2.2.22 062 ..(KA's)

ANSWER: 051 (1.00)

c.

REFERENCE:

2C20.5 section 5.19

MEMORY

NEW

076 K2.01 ..(KA's)

ANSWER: 056 (1.00)

b.

REFERENCE:

Fig B5-10 Auto Rod Speed

Program Fig B5-6 Rod

Control Signals

HIGHER

NEW

001 A3.06 ..(KA's)

ANSWER: 047 (1.00)

b.

REFERENCE:

B20.9, DC Distribution
System

MEMORY

NEW

063 A4.03 ..(KA's)

ANSWER: 052 (1.00)

c.

REFERENCE:

B34 section 4.2 Fig B34-1

HIGHER

NEW

2.1.28 078 ..(KA's)

ANSWER: 057 (1.00)

a.

REFERENCE:

Plant response

MEMORY

knowledge

HIGHER

BANK

002 K5.11 ..(KA's)

ANSWER: 048 (1.00)

d.

REFERENCE:

1C20.9 AOP1, automatic
action 2.2.3

MEMORY

MODIFIED

063 K1.02 ..(KA's)

ANSWER: 053 (1.00)

b.

REFERENCE:

NF-40313-1, 2 ARP

47023-0303

HIGHER

NEW

078 K4.01 ..(KA's)

ANSWER: 058 (1.00)

b.

REFERENCE:

Fig B7-20 Logic diagrams

NF-40784-1, 40780-2

HIGHER

MODIFIED

011 K4.06 ..(KA's)

ANSWER: 049 (1.00)

a.

REFERENCE:

B20.7

HIGHER

BANK

064 A1.03 ..(KA's)

ANSWER: 054 (1.00)

b.

REFERENCE:

B18C, Engineered Safety
Features E-0, Reactor Trip
and Safety Injection

SP1032A Precaution 3.1

HIGHER

NEW

103 A2.03 ..(KA's)

ANSWER: 059 (1.00)

b.

REFERENCE:

FUNDAMENTAL BANK

015 K2.01 ..(KA's)

ANSWER: 060 (1.00)
 a.
 REFERENCE:
 B7, Reactor Control System
 HIGHER
 BANK
 016 K3.12 ..(KA's)

ANSWER: 065 (1.00)
 b.
 REFERENCE:
 C47022-0305, 0307
 HIGHER
 NEW
 2.4.50 086 ..(KA's)

ANSWER: 070 (1.00)
 d.
 REFERENCE:
 1C1.2, Unit Startup
 Procedure
 HIGHER
 MODIFIED
 2.2.2 ..(KA's)

ANSWER: 061 (1.00)
 a.
 REFERENCE:
 B7
 HIGHER
 BANK
 041 A1.02 ..(KA's)

ANSWER: 066 (1.00)
 d.
 REFERENCE:
 Technical Specifications
 MEMORY
 NEW
 2.1.11 ..(KA's)

ANSWER: 071 (1.00)
 b.
 REFERENCE:
 F2, Radiation Safety
 HIGHER
 BANK
 2.3.2 ..(KA's)

ANSWER: 062 (1.00)
 b.
 REFERENCE:
 D5.2
 MEMORY
 MODIFIED
 034 K1.02 ..(KA's)

ANSWER: 067 (1.00)
 a.
 REFERENCE:
 Given References
 HIGHER
 BANK
 2.1.25 ..(KA's)

ANSWER: 072 (1.00)
 d.
 REFERENCE:
 F2, Radiation Safety
 MEMORY
 BANK
 2.3.4 ..(KA's)

ANSWER: 063 (1.00)
 c.
 REFERENCE:
 C80001 Remote Alarm
 Response Procedure B11,
 Radiation Monitoring System
 C11, Radiation Monitoring
 System
 MEMORY
 MODIFIED
 072 A2.02 ..(KA's)

ANSWER: 068 (1.00)
 a.
 REFERENCE:
 Reactor Fundamentals
 Appendix C1B step 5.3.2
 HIGHER
 NEW
 2.2.1 ..(KA's)

ANSWER: 073 (1.00)
 b.
 REFERENCE:
 1C19.2 Containment System
 Ventilation Unit 1, sections
 2.0, 3.5, 3.6, and 5.1.
 MEMORY
 NEW
 2.3.9 ..(KA's)

ANSWER: 064 (1.00)
 b.
 REFERENCE:
 B34, Instrument and Station
 Air C34 AOP1 Loss of
 Instrument Air
 HIGHER
 MODIFIED
 079 A4.01 ..(KA's)

ANSWER: 069 (1.00)
 c.
 REFERENCE:
 ITS section 1.3, Completion
 Times, page 1.3-1 G1
 sections 6.4.2, 6.4.5
 MEMORY
 BANK
 2.2.12 ..(KA's)

ANSWER: 074 (1.00)
 d.
 REFERENCE:
 1C1.2 section 5.14 B-8 table
 B8-1, B8-2
 HIGHER
 BANK
 2.4.2 ..(KA's)

REACTOR OPERATOR

Page 53

ANSWER: 075 (1.00)

c.

REFERENCE:

ECA-0.0

MEMORY

BANK

2.4.6 ..(KA's)

(***** END OF EXAMINATION *****)

ANSWER KEY

001 a	020 d	039 d	057 a
002 c	021 c	040 a	058 b
003 d	022 b	041 d	059 b
004 c	023 c	042 b	060 a
005 a	024 b	043 d	061 a
006 b	025 c	044 d	062 b
007 b	026 b	045 a	063 c
008 d	027 c	046 c	064 b
009 d	028 b	047 b	065 b
010 b	029 c	048 d	066 d
011 d	030 a	049 a	067 a
012 a	031 a	050 a	068 a
013 d	032 b	051 c	069 c
014 c	033 a	052 c	070 d
015 a	034 c	053 b	071 b
016 a	035 b	054 b	072 d
017 d	036 b	055 b	073 b
018 c	037 b	056 b	074 d
019 d	038 d		075 c

(***** END OF EXAMINATION *****)