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<p><b>U.S. Nuclear Regulatory Commission</b></p> <p><b>Site-Specific SRO Written Examination</b></p>
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Applicant Information	
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Name: \_\_\_\_\_

Date: May 19, 2006

Facility/Unit: BRAIDWOOD U1/U2

Region: I ☐ II ☐ III ☐ IV ☐Reactor Type: W ☐ CE ☐ BW ☐ GE ☐

Start Time: 0800 CDT
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Finish Time:
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### **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 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.

<p style="text-align: center;"><b>Applicant Certification</b></p> <p>All work done on this examination is my own. I have neither given nor received aid.</p> <p style="text-align: right;">_____ Applicant's Signature</p>
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<p style="text-align: center;"><b>Applicant Certification</b></p> <p>All work done on this examination is my own. I have neither given nor received aid.</p> <p style="text-align: right;">_____ Applicant's Signature</p>
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Results	
RO/SRO-Only/Total Examination Values	<u>75.0</u> / <u>25.0</u> / <u>100.0</u> Points

Applicant's Scores \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Points

## Results

RO/SRO-Only/Total Examination Values	<u>75.0</u> / <u>25.0</u> / <u>100.0</u> Points
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Applicant's Scores \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Points

Applicant's Grade	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border-bottom: 1px solid black; width: 40px;"></div> <div style="font-size: 1.2em;">/</div> <div style="border-bottom: 1px solid black; width: 40px;"></div> <div style="font-size: 1.2em;">/</div> <div style="border-bottom: 1px solid black; width: 40px;"></div> </div> <div style="text-align: right; padding-right: 10px;">Percent</div>
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## **POLICIES AND GUIDELINES FOR TAKING NRC EXAMINATIONS**

1. 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 to ask 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.
6. 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.
7. To pass the examination, you must achieve an overall grade of 80.00 percent or greater, with 70.00 percent or greater 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 overall grade of 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.
8. For an initial examination, the nominal time limit for completing the examination is 6 hours for the RO exam; 3 hours for the 25-question, SRO-only exam; 8 hours for the combined RO/SRO exam; and 4 hours for the SRO exam limited to fuel handling. Notify the proctor if you need more time.
9. You may bring pens, pencils, and calculators into the examination room; however, programable memories must be erased. Use dark pencil to facilitate machine grading. Use the examination pages for scrap paper and calculations. Upon completion of the examination, the examinations will be retained by the examination facility proctor.
10. Print your name in the blank provided on the examination cover sheet and the answer sheet.
11. If you are recording your answers on a machine-gradable form that offers more than four answer choices (e.g., "a" through "e"), be careful to mark the correct column.

12. If you have any questions concerning the intent or the initial conditions of a question, do not hesitate to ask them before answering the question. Note that questions asked during the examination are taken into consideration during the grading process and when reviewing applicant appeals. Ask questions of the NRC examiner or the designated facility instructor only. A dictionary is available if you need it.
13. 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. Similarly, you should assume that no operator actions have been taken, unless the stem of the question or the answer choices specifically state otherwise. 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.
14. 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.
15. When you complete the examination, assemble a package that includes the examination cover sheet and the answer sheets and give it to the NRC examiner or proctor. Leave all other material on your desk face down. 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.
16. After turning in your examination, leave the examination room. Do not return to the room while the examination is still in progress.
17. Do you have any questions?

## QUESTION: 001 (1.00)

Given:

- Unit 1 tripped from full power following 30 days of full power operation.
- The crew has transitioned to 1BwEP ES-0.1, REACTOR TRIP RESPONSE.
- All systems functioned as designed
- RCS pressure is 2235 psig and stable.
- RCS temperature is 557°F and stable.
- RCS boration has NOT been initiated.
- Unit 1 Burnup is 6500 EFPD.

Assuming all of the above conditions remain as stated, at which of the following times after the reactor trip would shutdown margin be the GREATEST?

- a. 3 - 5 hours
- b. 7 - 9 hours
- c. 20 - 25 hours
- d. 25 -50 hours

## QUESTION: 002 (1.00)

Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- RCS pressure is 1810 psig and lowering rapidly.
- Pressurizer level is 72% and rising rapidly.
- PRT temperature, pressure and level are rising.

Based on the above indication

- a. manually trip the reactor, verify the reactor tripped, and manually actuate SI."
- b. manually trip the reactor and verify the reactor tripped. Do NOT manually actuate SI.
- c. verify/insert control rods at 48 steps per minute.
- d. close PZR PORV block valves and restore PZR pressure to normal.

QUESTION: 003 (1.00)

Given:

- Unit 1 is at 100% power.
- The crew placed excess letdown in service one hour ago in conjunction with normal letdown.
- 1CV8143, Excess Letdown to Seal Filter or RCDT Valve, is in the VCT position.
- The following indications are noted by the crew:
  - VCT level is slowly lowering.
  - ALL RCP seal injection flows have been stable for the past 55 minutes.
  - ALL RCP seal return flows have been stable for the past 55 minutes.
  - CC surge tank level has been rising slowly for the past 15 minutes.
  - CC surge tank level is currently 76%.
  - 1PR09J, Unit 1 CC Heat Exchanger Rad Monitor, is in ALERT.

Based on the above indications, a leak has developed in which of the following heat exchangers?

- a. Letdown
- b. 1B RCP Thermal Barrier
- c. Seal Water
- d. Excess Letdown

## QUESTION: 004 (1.00)

Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A large RCS LOCA occurred.
- All systems functioned as designed.
- The operating crew implemented 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, and transitioned to 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, due to RWST level.
- The crew has completed aligning CV and SI pump suction from the RH pumps and is preparing to align the CS pumps for recirculation with the following indications.
  - RWST level is 15%.
  - CS is NOT reset.
  - SI is reset.
  - ALL CV, SI, RH, and CS pumps are running.
- A loss of offsite power occurs.
- BOTH DG output breakers have just closed.

Based on the above indications, the operator's FIRST action is to . . .

- a. start BOTH RH pumps.
- b. place BOTH CV pumps in pull out.
- c. verify ALL ECCS pumps start on the safe shutdown sequencer.
- d. place BOTH CS pumps in pull out.

QUESTION: 005 (1.00)

Given:

- A small break RCS LOCA occurred on Unit 1.
- Due to ECCS equipment failures, the crew has entered 1BwFR-C.1, RESPONSE TO INADEQUATE CORE COOLING.
- ALL RCPs are secured.
- The crew is preparing to start RCPs with the following conditions:
  - CETCs = 1324°F.
  - RCS pressure = 580 psig.
  - ALL SG levels are adequate to support RCP operation.
  - NO CC pumps running or available.
  - ALL 6.9 KV buses are energized.

Based on the above conditions, an RCP will . . .

- a. be started to temporarily restore core cooling.
- b. NOT be started, since minimum RCP support conditions are NOT met.
- c. NOT be started, since starting the RCP would add additional heat to the RCS.
- d. be started to allow restoration of normal pressurizer pressure control.



QUESTION: 006 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- PZR level is at 60%.
- 1A CV pump is running.
- 1CV121, Centrifugal Charging Pump Flow Control Valve, is in MANUAL control.
- Charging flow is 132 gpm.
- 1CV182, Charging Header Back Pressure Control Valve, is at 52% demand.
- Seal injection flows are 11 gpm per RCP.
- 1A CV pump impeller begins to slowly degrade.

In order to maintain pressurizer level at 60% AND RCP seal injection flows at 11 gpm, the operators must . . .

- a. throttle open 1CV121 AND maintain 1CV182 at 52% demand.
- b. throttle open 1CV121 and throttle closed 1CV182.
- c. throttle closed 1CV121 AND 1CV182.
- d. throttle closed 1CV121 and throttle open 1CV182.

QUESTION: 007 (1.00)

Given:

- A large break RCS LOCA occurred on Unit 1.
- The operating crew has aligned both trains of ECCS and CS for cold leg recirculation per 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- Containment floor water level = 35".
- Three containment sump lights are lit on each train.
- ALL ECCS pump parameters are stable.
- RWST level = 5%.

The crew transitions to 1BwCA-1.3, SUMP BLOCKAGE CONTROL ROOM GUIDELINE.

Which of the following actions will the crew perform FIRST and why?

- a. Throttle 1RH606 & 607, RH Pump Flow Control Valves, to align RH pumps for recirculation flow to the RCS.
- b. Open 1CV112D & E, RWST to CV Pumps Suction Valves, to align one CV pump suction to the RWST.
- c. Close 1SI8809A & B, RH to Cold Leg Isolation Valves, to align RH pumps to supply recirculation suction for one CV or one SI pump.
- d. Immediately stop ALL ECCS pumps, to prevent pump damage due to a loss of suction source.

QUESTION: 008 (1.00)

Given:

- Unit 1 is in Mode 1 at 100% power.
- 1A CC Pump is running.
- 0 CC Pump is aligned to Bus 142.
- 0 CC Pump Bus 142 C/S is in NAT.
- 0 CC Hx is aligned to Unit 1.
- 1TK-130, Letdown Heat Exchanger Outlet Temperature Controller, is in MANUAL at 55% demand.
- Annunciator 1-2-B5, CC Pump Discharge Pressure Low, is in alarm.
- 1B CC Pump automatically started and immediately tripped due to overcurrent.

Which of the following actions would raise CC system pressure?

- a. Locally close 1CC9504A, 1A RH Hx Outlet Valve.
- b. Locally open 1CC9503, Spent Fuel Pool Hx Outlet FCV.
- c. Raise demand on 1TK-130 to 75%.
- d. Place 1B CC pump C/S in pull out.

QUESTION: 009 (1.00)

Given:

- A Unit 1 manual reactor trip was initiated due to a RCS leak inside containment.
- The following indications are present on 1PM05J:
  - Reactor Trip Breakers (RTA and RTB) green indicating lights are LIT.
  - Reactor Trip Breakers (RTA and RTB) red indicating lights are NOT LIT.

Which of the following describes the current status of the components associated with each Reactor Trip Breaker? (Assume RTA AND RTB are NOT mechanically bound)

Each reactor trip breaker circuit has

- a. energized BOTH the undervoltage coil AND shunt trip coil.
- b. failed to de-energize the undervoltage coil AND failed to energize the shunt trip coil.
- c. de-energized BOTH the undervoltage coil AND shunt trip coil.
- d. failed to energize the undervoltage coil AND failed to de-energize the shunt trip coil.

QUESTION: 010 (1.00)

Given:

- Unit 2 was at 100% power, all systems normally aligned.
- A large steam break occurred outside containment, downstream of the MSIVs.
- A manual reactor trip and MS isolation were actuated.
- All systems functioned as designed.

Based on the above conditions, the ES Non-Return Check Valves

- a. close to minimize the RCS cooldown from the steam line break.
- b. close to prevent over speeding the main turbine due to reverse steam flow from the FW heaters.
- c. open to drain condensed steam in the ES piping to prevent water hammer.
- d. open to prevent over pressurizing the FW heaters shells.

QUESTION: 011 (1.00)

Given:

- Unit 1 was at 100% power.
- Unit 2 is defueled.
- Unit 1 reactor was manually tripped due to lowering SG NR levels.
- Operators are verifying AF system alignment in step 15 of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, with the following indications:
  - 1A AF pump is OOS.
  - 1B AF pump is running with 760 gpm discharge flow.
  - Annunciator 1-3-A7, AF Pump Suction Pressure Low, is in alarm.
  - Annunciator 1-3-E7, AF Pump SX Suction Valves Armed, is in alarm.
  - AF pump suction pressure is 17.5 psia.
  - ALL SG NR levels are 0%.
  - Unit 1 CST level is 30% and lowering rapidly
  - Unit 2 CST is empty for maintenance.

Based on the above indications, the operators FIRST action(s) is (are) to

- a. cross-tie Unit 1 and Unit 2 CSTs.
- b. verify open 1SX006B and 1SX017B, 1B AF Pump SX Suction Valves.
- c. establish feed flow per 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK.
- d. throttle 1AF005E-H, AF Flow Control Valves, to 0% to raise AF pump suction pressure.

## QUESTION: 012 (1.00)

Given:

- Unit 1 is in mode 6, core off load is in progress.
- A loss of off-site power occurs.
- All systems function as designed.

Tech Specs require the Unit 1 operators to

- a. suspend the core off load immediately.
- b. verify both Unit 2 DGs are operable within 1 hour.
- c. verify unborated water source isolation valves closed within 1 hour.
- d. perform 1BwOSR 3.8.1.1, Normal and Alternate Off-Site Power Availability Surveillance, within 1 hour.

## QUESTION: 013 (1.00)

Given:

- A loss of Instrument Bus 114 has occurred.
- Operators have locally isolated instrument air to 1AF005E-H, AF Flow Control Valves.
- 1AF013A-H, AF Isolation Valves, are open.
- A reactor trip occurred and AF has actuated.

1B train AF flow can be controlled by . . .

- a. throttling 1AF005E-H locally AND at the RSDP.
- b. throttling 1AF005E-H locally AND throttling 1AF013E-H in the MCR.
- c. throttling 1AF005E-H in the MCR AND at the RSDP.
- d. throttling 1AF005E-H AND 1AF013E-H in the MCR.

QUESTION: 014 (1.00)

Given:

- Unit 1 is at 50% power, all systems normally aligned.
- Annunciator 1-21-E10, 125 VDC Distribution Panel 111/113 Volt Low, is in alarm.

Which of the following would indicate ONLY 125 VDC Bus 113 is de-energized?

- a. 1FW510, 1A Feed Reg Valve, closed light lit at 1PM04J.
- b. PMG output breaker open light lit at 1PM01J.
- c. DC Bus 111 Voltage is 130V at 1PM01J.
- d. PR N43 drawer is de-energized at 1PM07J.



QUESTION: 015 (1.00)

Given:

- Unit 1 was at 100% power.
- All systems normally aligned.
- A reactor trip occurred on Unit 1 and transition to 1BwEP ES-0.1, REACTOR TRIP RESPONSE, has been made.
- 1B SX pump has TRIPPED.
- Annunciator 1-2-A2, SX Pump Discharge Header Pressure Low, is in alarm.
- 1BwOA PRI-8, ESSENTIAL SERVICE WATER MALFUNCTION, has been entered with the following conditions:
  - 1A SX pump was started.
  - Annunciator 1-2-C2, SX Strainer DP High, is in alarm.
  - Annunciator 1-2-A2 remained in alarm.
- 1A SX pump inboard and outboard bearing temps are 156°F and rising at 2°F/min.
- 1A AF pump is running, all bearing temps are 133°F and rising at 4°F/min.
- 1B AF pump is running, all bearing temps are 130°F and rising at 2°F/min.
- 1A CV pump is running, all bearing temps are 178°F and rising at 3°F/min, gear drive oil temperature is 154°F and rising at 1.5°F/min.
- 1B CV pump is in standby.

If ALL trends continue for the NEXT 10 minutes, what action(s) are required?  
(1BwOA PRI-8, Table A is attached)

- a. Trip ONLY 1A AF pump AND 1A CV pump
- b. Trip ONLY 1B AF pump, 1A CV pump, and 1A SX pump
- c. Trip ONLY 1A AF pump, 1A CV pump, and 1A SX pump
- d. Trip ONLY 1A AF pump AND 1B AFW pump.

QUESTION: 016 (1.00)

When performing 1BwCA-1.2, LOCA OUTSIDE CONTAINMENT, why are RH components isolated BEFORE other ECCS components?

- a. To ensure RCS injection flow is maintained during leak identification.
- b. This allows the CV pumps to maintain RCP support conditions.
- c. To ensure RH remains available for long term cooling.
- d. The leak is most likely to occur in the RH system.

QUESTION: 017 (1.00)

Given:

- Unit 1 was at 100% power, all systems normally aligned.
- A large break RCS LOCA occurred.
- While performing 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, 1SI8811A AND 1SI8811B, Containment Sump Isolation Valves, failed to open.
- The operating crew has implemented 1BwCA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

Under these conditions, which of the following states the reason 1BwCA-1.1 directs establishing only one train of SI flow?

- a. To reduce the RWST depletion rate to delay stopping all pumps taking a suction from the RWST.
- b. To allow initiating blended makeup flow to the suction of the charging pumps.
- c. To reduce the RCS cooldown rate to less than 100°F/hr when dumping steam at maximum rate.
- d. To maintain one train of ECCS pumps available for future use.

QUESTION: 018 (1.00)

Given:

- Unit 1 was at 100% power.
- A loss of heat sink has occurred.
- NO CV pumps are available.
- The operating crew is establishing RCS 'Bleed and Feed' in accordance with 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK.
- After all methods to establish a bleed path are attempted, ONLY ONE PZR PORV is open.

Which of the following describes the INITIAL consequence of having only one PZR PORV open?

- a. RCS pressure will continue to rise to the PZR safety valve lift setpoint, leading to further loss of RCS inventory.
- b. Insufficient natural circulation flow will inhibit mixing of SI flow in the reactor core, leading to localized PTS.
- c. The RCS will NOT depressurize enough to prevent excessive primary-secondary differential pressure, leading to a SGTR.
- d. The RCS will NOT depressurize enough to ensure sufficient SI flow to provide RCS heat removal, leading to an inadequate core cooling condition.

## QUESTION: 019 (1.00)

Given:

- Unit 1 is at 90% power.
- All systems are normally aligned.
- A power ramp to 100% power at 0.2 MW/min is in progress.
- Annunciator 1-10-E6, Rod At Bottom, alarms with the following conditions:
- DRPI for rods H-4 and D-8 indicates 0 steps.
- Control rods are withdrawing in automatic.
- Tave is lowering rapidly.

Based on the above indications, the reactor operator is required to . . .

- a. place rod control in manual AND adjust turbine load to maintain Tave/Tref within 3°F.
- b. stop the turbine load increase AND check PDMS for operability.
- c. manually trip the reactor AND perform immediate actions of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.
- d. stabilize RCS temperature AND check the status of the flux rate trip alarm.

QUESTION: 020 (1.00)

Given:

- Unit 2 is at 30% power.
- All systems are normally aligned.
- Annunciator 2-10-C6, Rod Control Urgent Failure, alarms due to a failure in the RD logic cabinet.
- An automatic reactor trip signal occurs due to a loss of feedwater.
- The reactor does NOT trip.
- A manual reactor trip was unsuccessful.
- Operators enter 2BwFR-S.1, RESPONSE TO NUCLEAR GENERATION/ATWS, with the following conditions:
  - RTA and RTB are closed.
  - Reactor power is 28.5%.
  - The turbine is tripped.
  - AF pumps are running.
  - Steam dumps are isolated.
  - Emergency boration is in progress via 2CV8104, Emergency Boration Valve, and 2A CV pump.

Which of the following verifies negative reactivity is being inserted from the boration?

- a. 35 gpm indicated on 2FT-0111, PW/Total Flow recorder.
- b. Annunciator 2-10-B6, Rod Bank Low Insertion Limit, in alarm.
- c. ALL PZR Backup Heaters are energized.
- d. Auct High Tave lowering.

QUESTION: 021 (1.00)

Given:

- Unit 1 is at 100% power.
- An alarm sounds on the RM-11 and the following indications are noted:
  - The GRID 1 display for 1PR03J, 1B/1D RCFC SX Outlet Radiation Monitor, is DARK BLUE.
- No other cursors are lit on the STATUS DISPLAY for 1PR03J.

Based on the above indications, the NSO should inform the Unit Supervisor that 1PR03J . . .

- a. has an operate failure. 1PR03J is NOT available to monitor the 1B/1D RCFC SX process stream from the MCR.
- b. has lost communication with the RM-11. The channel can be monitored locally at the skid.
- c. is undergoing a check source test. The NSO will verify check source test successfully completed.
- d. has an alert alarm condition. The 1B/1D RCFCs should be manually stopped AND 1SX016B and 1SX027B should be manually closed.

QUESTION: 022 (1.00)

Given:

The Fuel Handling Building Ventilation system is aligned for standby operation.

- 0VA04CA - 0A Fuel Handling Building Charcoal Booster Fan.
- 0VA060Y - 0A Fuel Handling Building Charcoal Absorber Inlet Isolation Damper.
- 0VA051Y - 0A Fuel Handling Building Charcoal Absorber Bypass Isolation Damper.

Which of the following describes the response associated with the Fuel Handling Building Ventilation System upon receipt of a Fuel Handling Building HIGH radiation alarm on ORT-AR055, Train A Fuel Handling Incident Monitor?

- a. 0VA04CA must be started manually, 0VA060Y opens.
- b. 0VA04CA automatically starts, 0VA060Y opens.
- c. 0VA04CA must be started manually, 0VA051Y closes.
- d. 0VA04CA automatically starts, 0VA051Y opens.

QUESTION: 023 (1.00)

Given:

- Unit 1 was at 100% power.
- 1A AF pump is OOS.
- A fire occurred in the AEER.
- The crew entered 0/1BwOA PRI-5, CONTROL ROOM INACCESSIBILITY, and tripped the reactor.
- When the low-2 SG NR level was reached, the 1B AF automatically started.
- The 1B AF pump tripped shortly after starting due to low-3 suction pressure caused by fire damage to the AF pump suction pressure circuitry.

Based on the above conditions, the 1B AF pump will be started

- a. at the Unit 1 RSDP by placing its selector switch to local and the RSDP C/S to start.
- b. at 364' by placing the L/C/S to start.
- c. at 1AF01J by placing the selector switch to manual and depressing the start button.
- d. at 364' by placing the L/C/S to start with bypass.



QUESTION: 024 (1.00)

Given:

- A small break RCS LOCA has occurred on Unit 1.
- Conditions have deteriorated and the crew has implemented 1BwFR-C.2, RESPONSE TO DEGRADED CORE COOLING.
- The crew is depressurizing all intact SGs to 90 psig.
- If a red path condition arises on the integrity status tree, the crew is directed to complete 1BwFR-C.2 prior to implementing 1BwFR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

Why is the crew directed to complete 1BwFR-C.2 prior to implementing 1BwFR-P.1?

- a. The RCS is NOT expected to repressurize during performance of 1BwFR-C.2, therefore PTS is NOT a concern.
- b. Stopping the SG depressurization as directed in 1BwFR-P.1 would result in a COMPLETE LOSS of natural circulation and reflux cooling.
- c. 1BwFR-P.1 prevents operation of the RCPs, which may be required to be operated in 1BwFR-C.2.
- d. Stopping the cooldown as directed in 1BwFR-P.1 would prevent lowering RCS pressure to allow the RH pumps to inject, leading to inadequate core cooling.

QUESTION: 025 (1.00)

Given:

- A Unit 1 core reload is in progress.
- The containment Fuel Handling Supervisor reports a twice burned fuel assembly fell from the refueling machine into the core and burst.
- 1AR011 and 1AR012, Containment Fuel Handling Incident Monitors, are in high alarm and rising rapidly.

Per 1BwOA REFUEL-1, FUEL HANDLING EMERGENCY, the operator's FIRST action is to . . .

- a. verify/close containment vent isolation valves.
- b. notify the Fuel Handling Supervisors to place all fuel assemblies in secure locations.
- c. notify personnel to evacuate containment.
- d. dispatch an operator to close 1FH001, Fuel Transfer Tube Isolation Valve.

## QUESTION: 026 (1.00)

Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A small break RCS LOCA occurred.
- The crew is performing 1BwEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION.
- BOTH SI pumps are running.
- RCS pressure is stable.
- The crew has determined that RCS subcooling is adequate to secure ONE SI pump.

When one SI pump is stopped, RCS subcooling will . . .

- a. lower due to break flow remaining CONSTANT while ECCS flow lowers. RCS subcooling will then stabilize at a lower value when RCS temperature stabilizes at a higher value.
- b. remain the same. Flow from the remaining running SI pump will rise, reaching a balance with break flow.
- c. lower as RCS pressure lowers due to reduced ECCS flow. RCS subcooling will then stabilize at a lower value when RCS break flow equals ECCS flow.
- d. remain the same. RCS temperature rises in response to the reduced ECCS flow, but RCS pressure will also rise.

## QUESTION: 027 (1.00)

Given:

- Unit 1 is performing a natural circulation cooldown per 1BwEP ES-0.2, NATURAL CIRCULATION COOLDOWN.
- RCS temperature is 500°F.
- RCS pressure is 1875 psig.
- ALL CRDM exhaust and booster fans are tripped and CANNOT be restarted.
- RVLIS train A head AND plenum levels indicate 100%.
- RVLIS train B is de-energized.

Continuing the RCS cooldown and depressurization under these conditions will require . . .

- a. maintaining RCS subcooling acceptable per Attachment A and figure 1BwEP ES 0.2-3 (+100°F) during the cooldown and depressurization.
- b. immediately transitioning to 1BwEP ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS).
- c. maintaining RCS subcooling acceptable per the Iconics Display during the cooldown and depressurization.
- d. immediately transitioning to 1BwEP ES-0.4, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLIS).

## QUESTION: 028 (1.00)

Given:

- Unit 2 is at 11% power.
- Main Turbine startup is in progress at 1700 rpm.
- All systems are normally aligned for the current power level.

Which transformer provides power to the 2A Reactor Coolant Pump?

- a. UAT 241-1
- b. UAT 241-2
- c. SAT 242-1
- d. SAT 242-2

## QUESTION: 029 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems normally aligned.
- Annunciator 1-7-C3, RCP Seal Leakoff Flow Low, is in alarm.

With no operator action, which of the parameters listed below would be indicative of a failed RCP seal leakoff instrument (and that the seal has NOT failed) for the affected RCP?

- a. Stable thrust bearing temperature.
- b. Rising seal injection flow.
- c. Stable lower bearing temperature.
- d. Rising seal outlet temperature.

## QUESTION: 030 (1.00)

Given:

- Unit 2 is in Mode 5.
- The pressurizer is solid.
- RCS pressure is 350 psig and stable.
- RH letdown is in service.
- Normal charging is in service.

If Instrument Bus 214 is de-energized, with NO operator action over the next 10 minutes, RCS pressure will . . .

- a. rise due to 2CV121, Centrifugal Charging Pump Flow Control Valve, failing OPEN.
- b. rise due to 2CV128, RH to CV Letdown Flow Control Valve, failing CLOSED.
- c. lower due to 2CV131, Letdown Line Pressure Control Valve, failing OPEN.
- d. lower due to 2CV182, Charging Header Back Pressure Control Valve, failing CLOSED.

QUESTION: 031 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- An extra NSO is performing 1BwOSR 3.5.5.1, RCS Seal Injection Flow Surveillance, with the following indications:
  - Average PZR pressure is 2235 psig.
  - Charging header pressure is 2360 psig.
  - 1CV182, Charging Header Back Pressure Control Valve, demand is at 100%.
- 1A RCP seal injection flow is 11.8 gpm.
- 1B RCP seal injection flow is 12.7 gpm.
- 1C RCP seal injection flow is 12.5 gpm.
- 1D RCP seal injection flow is 12.0 gpm.

Based on the above indications, RCP seal injection flow is . . .

- a. acceptable, NO actions are required.
- b. NOT acceptable, CV pumps will NOT deliver sufficient flow to maintain seal integrity.
- c. NOT acceptable, CV pumps will NOT deliver sufficient flow in the event of a LOCA.
- d. NOT acceptable, CV pumps will run out if SI is actuated.

## QUESTION: 032 (1.00)

Given:

- Unit 1 is in Mode 4.
- ALL RCS cold leg temperatures are 340°F.
- RCS boron concentration is 1590 ppm.
- RCS pressure is 345 psig.
- 1A RH train is aligned for cold leg injection.
- 1B RH train is being aligned for shutdown cooling.
- 1B RH train boron concentration is 1250 ppm

Placing the 1B RH train in service, with NO additional operator action, would cause . . .

- a. boron plate out on the RH Hx.
- b. an inadvertent entry into mode 3.
- c. RCS temperature and pressure to rapidly lower.
- d. a reduction in shutdown margin.

## QUESTION: 033 (1.00)

Given:

- Unit 2 is in Mode 5.
- All systems are properly aligned.
- Unit 2 is in reduced inventory condition (reactor vessel level is 396.5').
- 2A RH pump is in shutdown cooling.
- A 200 gpm leak develops in the RCS inside containment.

With no operator action, which of the indications below would be observed in the MCR?

- a. Annunciator 2-6-C1, RH Pump 2A Discharge Flow Low, alarming periodically.
- b. 2TI-612, 2A RH Pump Discharge Temperature, lowering.
- c. 2A RH Pump Amps off scale high.
- d. Annunciator 2-6-B1, RH Pump 2A Discharge Pressure High, alarming periodically.

## QUESTION: 034 (1.00)

Given:

- A large break RCS LOCA occurred on Unit 1.
- RWST level is 32%.
- 1CV8110, CV Pump Miniflow Isolation Valve, is closed.
- No SI actuations/signals have been reset.

If the NSO momentarily places the control switch for 1CV8110 to OPEN, 1CV8110 will . . .  
(20E-1-4030CV16 is attached)

- a. open fully and immediately reclose.
- b. NOT open (remain closed).
- c. open fully and remain open.
- d. open until dual position indication is obtained, then reclose.

## QUESTION: 035 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- Annunciator 1-12-B7, PRT Pressure High, is in alarm.
- 1PI-469, PRT pressure, is 7 psig and slowly rising.
- 1LI-470, PRT level, is 66% and slowly rising.
- 1RE1003, RCDT Pumps Discharge Containment Isolation Valve, is open at 1PM11J.

Based on the above indications, the FIRST action that will restore PRT pressure is . . .

- a. 1RY469, PRT to GW Isolation Valve, automatically opens.
- b. 1RY8031, PRT Drain Isolation Valve, automatically opens.
- c. 1RY8031, PRT Drain Isolation Valve, is manually opened.
- d. 1RY469, PRT to GW Isolation Valve, is manually opened.



## QUESTION: 036 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems normally aligned.
- A LARGE BREAK RCS LOCA occurred inside containment.
- Containment Spray and Phase B have actuated.
- All systems respond as designed.

The RCPs must be tripped to . . .

- a. prevent overheating the RCP motor bearings due to a loss of cooling.
- b. prevent degradation of the RCP seal packages resulting in further loss of RCS inventory.
- c. allow the RCP flywheel to provide coast down flow.
- d. prevent forced circulation causing excessive mass loss through the RCS break.

## QUESTION: 037 (1.00)

Which of the following describes why the pressurizer spray valves have a continuous bypass flow feature?

During steady state operation, pressurizer spray bypass flow provides adequate flow to . . .

- a. prevent PZR spray nozzle thermal shock upon initiation of spray flow.
- b. maintain PZR variable heater output at a minimum value.
- c. maintain PZR spray valves in their optimum throttling region.
- d. prevent PZR/RCS differential temperature limits from being exceeded.

QUESTION: 038 (1.00)

Given:

- Unit 2 is at 50% power.
- All systems are normally aligned.
- The temperature portion of the loop B Overtemperature Delta T calculator has just failed as is.

If Unit 2 power is increased to 100% while maintaining PZR pressure at program value and AFD on target, what will be the plant response?

- a. Loop B OTDT setpoint will generate a rod stop as power nears 100%.
- b. Loop B OTDT setpoint will remain at its 50% value and other loop OTDT setpoints will lower.
- c. Loop B OTDT setpoint will lower at a slower rate than the other loop OTDT setpoints but no actuations will occur.
- d. An OTDT reactor trip will occur prior to Unit 2 reaching 100% power.

## QUESTION: 039 (1.00)

Given:

- The following indications existed on Unit 1 when an automatic reactor trip occurred:
- |                |           |           |           |           |
|----------------|-----------|-----------|-----------|-----------|
| - LOOP         | <u>1</u>  | <u>2</u>  | <u>3</u>  | <u>4</u>  |
| - Delta T      | 106%      | 107%      | 109%      | 110%      |
| - OT Delta T   | 109%      | 128%      | 110%      | 102%      |
| - OP Delta T   | 108%      | 105%      | 104%      | 101%      |
| - SG NR Levels | 34%       | 32%       | 25%       | 19%       |
| - PZR Pressure | 1885 psig | 2500 psig | 1920 psig | 1910 psig |

Based on the above indications, what is the bases for the Reactor Trip System function that initiated this automatic reactor trip?

- a. Ensure design limit DNBR is met.
- b. Prevent over pressurizing the RCS.
- c. Provide protection from loss of heat sink.
- d. Ensure allowable heat generation rate (kw/ft) of the fuel is NOT exceeded.

QUESTION: 040 (1.00)

Given:

- Unit 1 was at 100% power.
- The following sequence of events occurred:
- IMD was performing a surveillance calibration on PZR pressure channel 1PT-458 when PZR pressure channel 1PT-455 spiked low, resulting in an SI.
- The reactor tripped, however, Reactor Trip Breaker A did NOT open and CANNOT be opened locally.
- The SI signal is NO longer present.
  
- Both Train A and Train B SI Reset pushbuttons have been depressed.
- The following indications are present on 1PM05J Bypass Permissive Panel:
  - 1-BP-4.1, SI ACTUATED is NOT LIT.
  - 1-BP-5.1, AUTO SI BLOCKED is FAST FLASHING.
  
- Normal Charging and Letdown have been restored.
- All ECCS equipment has been restored to its normal alignment.

Then a 450 gpm SGTR occurs.

With NO further operator action, which of the following indicates the effect on the RCS over the next ONE HOUR time period?

- a. Charging and letdown flow will continue to attempt to maintain normal PZR level.
- b. ECCS injection flow will result in a water-solid PZR with relief via the PZR PORVs.
- c. RCS inventory will decrease until SI accumulator injection occurs.
- d. RCS pressure will stabilize when ECCS injection flow equals break flow.

## QUESTION: 041 (1.00)

Given:

- A reactor trip and safety injection have occurred on Unit 1.
- While performing step 7 of 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION, an NSO reports the Group 2 RCFC Accident Mode lights for 1A and 1C RCFCs are dark.

Which of the following indications would explain the failure of the 1A and 1C RCFC Accident Mode lights to illuminate?

- a. 1SX147A, 1A CNMT Chiller Bypass Valve, CLOSED light lit at 0PM02J.
- b. 1SX114A, 1A CNMT Chiller Outlet Valve, CLOSED light lit at 0PM02J.
- c. 1SX027A, 1A/1C RCFC Inlet Valve, OPEN light lit at 1PM06J.
- d. 1SX016A, 1A/1C RCFC Outlet Valve, OPEN light lit at 1PM06J.

## QUESTION: 042 (1.00)

Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- Annunciator 2-2-E4, CC Surge Tank Auto M/U On, is in alarm.
- CC Surge Tank level is 38% and lowering at 0.5% per minute.

Based on the above indications, the FIRST action the operators will perform is to:

- a. immediately place ALL Unit 2 CC Pumps in pull out, then go to 2BwOA PRI-6, COMPONENT COOLING MALFUNCTION.
- b. verify/open ONLY 2CC183, WM Makeup Valve.
- c. verify/open BOTH 2CC183, WM Makeup Valve AND 2CC182, PW Makeup Valve.
- d. immediately trip the reactor AND trip ALL RCPs, then go to 2BwEP-0, REACTOR TRIP OR SAFETY INJECTION.

QUESTION: 043 (1.00)

Given:

- A large break RCS LOCA occurred on Unit 2.
- Operators are preparing to align CS for recirculation per 2BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, with the following conditions:
  - Train A ECCS has been aligned for cold leg recirculation.
  - ALL CV, SI, and CS pumps are running.
  - 2A RH pump is running.
  - 2B RH pump is in pull out.
- 2SI8812B, RH Pump 2B Suction From RWST Isolation Valve, is closed. - 2SI8811B, Cnmt Sump 2B Isolation Valve, is closed and CANNOT be opened from the MCR.
- 2CS001B, CS Pump 2B RWST Suction Valve, is open.
- 2CS009B, CS Pump 2B Sump Suction Valve, is closed.
- RWST level is 7%.

Based on the above indications, the operators will . . .

- a. place 2B CV, 2B SI, 2A CS, AND 2B CS pumps in pull out due to an imminent loss of suction.
- b. place 2CS009B C/S to open, to align a suction source to the 2B CS Pump.
- c. place ONLY 2A AND 2B CS pumps in pull out due to inadequate suction source.
- d. Go to 2BwCA -1.1, LOSS OF EMERGENCY COOLANT RECIRC, due to failure of one train of ECCS to transfer to cold leg recirculation.

QUESTION: 044 (1.00)

Given:

- Unit 2 is in Mode 3, RCS cooldown is in progress per 2BwGP 100-5, PLANT SHUTDOWN AND COOLDOWN.
- RCS pressure is 1650 psig.
- RCS temperature is 505°F.
- ALL SG pressures are 690 psig.
- CNMT pressure is 0.4 psig.
- BOTH steamline isolation SI block bypass permissive lights are lit.

At time = 0 seconds a steamline break occurs inside containment.

At time = 10 seconds the following indications are noted:

- RCS pressure is 1600 psig.
- RCS temperature is 495°F.
- ALL SG pressures are 665 psig.
- Containment pressure is 0.9 psig.

If current trends continue, the MSIVs will BEGIN closing at approximately time =

- a. 20 seconds.
- b. 40 seconds.
- c. 60 seconds.
- d. 156 seconds.

## QUESTION: 045 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- BOTH turbine driven feedwater pumps are in auto.
- The Master FW Pump Speed Controller is in auto.
- 1B FW Pump LP Governor Valve fails closed over a one minute period.

Based on the above conditions, which of the following indications will be present on 1PM04J for the 1B FW Pump TWO minutes later? (Assume no operator action)

- a. The HP Governor Valve Closed light WILL NOT be lit AND HP Governor Demand WILL have increased.
- b. The Left LP Stop Valve Open light WILL NOT be lit AND the Low Press Governor Valve Closed light WILL be lit.
- c. The Low Press Gov Valve Closed light WILL be lit AND the Turbine Tripped light WILL be lit.
- d. 1FW012B, 1B FW Pump Recirc Valve, Open light WILL be lit AND the LP Governor Demand indicator WILL indicate 0%.

## QUESTION: 046 (1.00)

Given:

- Unit 1 is at 100% power.
- 1A FW pump is OOS for bearing replacement.
- 1B FW pump develops a severe vibration and subsequently trips.
- The crew implements 1BwOA SEC-1, SECONDARY PUMP TRIP.

After the crew stabilizes the plant and exits 1BwOA SEC-1, the maximum turbine power level allowed on Unit 1 will be . . . (assume PDMS remains operable throughout event)

- a. 50%.
- b. 55%.
- c. 60%.
- d. 65%.



QUESTION: 047 (1.00)

Given:

- Unit 1 is at 100% power.
- A SAT fault causes a loss of offsite power.
- Bus 159 does not ABT to the UAT and a reactor trip occurs.
- BOTH DGs start and energize their respective ESF buses.
- Bus 143 and 144 are de-energized.
  
- BOTH AF pumps are running.
- Steam dumps are in STM PRESS mode.
- SG NR levels are 14% and slowly rising.
- PZR pressure is 1950 psig and slowly lowering.
- RCS Tave is 554°F and slowly lowering.

Which of the following MCR actions will reduce the likelihood of a PZR low pressure SI occurring?

- a. Place PZR heaters C/Ss to ON.
- b. Throttle closed 1PK-507, MS Header Pressure Controller.
- c. Throttle closed 1AF005A-H, AF Flow Controllers.
- d. Place 1MS009A-D, MSR 2nd Stage Reheater Stop Valves, C/S to CLOSE.

## QUESTION: 048 (1.00)

Given:

- Unit 1 is at 100% power.
- Unit 2 is in Mode 3, preparing for a reactor startup.
- All equipment is properly aligned.
  
- A fault occurs on SAT 242-2.
- The crew enters 2BwOA ELEC-4, LOSS OF OFFSITE POWER.

In accordance with 2BwOA ELEC-4, which of the following loads will be aligned to the 2A DG when required to support plant operation?

- a. 0A MCR Chiller
- b. Unit 0 SAC
- c. Unit 0 480 Volt Buses
- d. 0C WS Pump

## QUESTION: 049 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- An undervoltage condition occurs on bus 141.
- The 1A DG starts.
- 15 seconds after the bus undervoltage, 125 VDC Bus 111 is de-energized.

Once the 1A DG receives a start signal, the 1A DG will . . .

- a. reach rated speed and voltage. ACB 1413 will remain open due to a loss of control power.
- b. NOT produce voltage due to loss of field flash. ACB 1413 will remain open due to a loss of control power.
- c. reach rated speed and voltage, and ACB 1413 will then close. 1A DG will stop and ACB 1413 will remain closed.
- d. reach rated speed and voltage, and ACB 1413 will then close. The 1A DG will remain running with ONLY the mechanical overspeed trip available.

QUESTION: 050 (1.00)

Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- 1A and 2B SX pumps are running.
- A fault occurs on bus 142, causing a loss of bus 142.
- 1B DG starts, but ACB 1423 does NOT close due to the bus fault.

The 1B DG . . .

- a. must be emergency stopped, 1SX169B, 1B DG Essential Service Water Valve, failed closed on the loss of power.
- b. may remain running, 1A SX pump will provide adequate cooling flow.
- c. must be emergency stopped, SX flow is inadequate because the 1B SX pump is NOT running.
- d. may remain running, 2B SX pump will provide adequate cooling.

QUESTION: 051 (1.00)

Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- Unit 0 CC Hx is aligned to Unit 1.
- 0/1/2PR09J, Unit 0/1/2 CC Hx SX Outlet Rad Monitors, are indicating 5.45E-07.
- 0/1/2PR09J have the following channel item settings:
  - 009 SETPOINT, HIGH ALARM = 1.89E - 05.
  - 010 SETPOINT, ALERT ALARM = 9.45E - 06.
- 0PR09J detector output fails to 3.00E - 03.
- 1/2PR09J indications have NOT changed.
- 1/2CC017, Unit 1/2 CC Surge Tank Vent Valves, are open.

Based on the above indications, the operators will . . .

- a. close ONLY 1CC017 due to the alignment of 0 CC Hx to Unit 1.
- b. notify chemistry to sample CC system activity, NO further action is required.
- c. close BOTH 1CC017 AND 2CC017 due to the failure of 0PR09J to automatically isolate BOTH CC surge tank vent paths.
- d. isolate the Unit 0 CC Hx and go to 1BWOA PRI-6, COMPONENT COOLING MALFUNCTION, due to a leak in the CC system.

## QUESTION: 052 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- 0A VC Train is running.
- A reactor trip and safety injection occur.
- All equipment functions as designed.
- The crew implements 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.
- While verifying control room ventilation properly aligned, an NSO discovers the following conditions:
  - 0PR31J, 0A Train Control Room Outside Air Intake Radiation Monitor, cursors are RED.
  - Main control room pressure is 0.165" H<sub>2</sub>O.

Based on the above information, the NSO will . . .

- a. reset the Control Room Vent Isolation signal, stop 0A VC Train equipment, and start 0B VC Train equipment.
- b. manually start the 0A VC Makeup Fan and manually align the 0A VC Charcoal Absorber.
- c. restore MCR pressure per BwOP VC-14, MAIN CONTROL ROOM PRESSURE LOW, while continuing on in 1BwEP-0.
- d. dispatch operators to verify Control Room Offices, Lab HVAC, and Radwaste Building fans are tripped.

QUESTION: 053 (1.00)

Given:

- Unit 2 is in Mode 5.
- The RCS is solid.
- 2A RH Pump is running in shutdown cooling mode.
- 2A AND 0 CC Pumps are running.
- 2CV131, Letdown Line Pressure Controller, is in AUTO.
- BOTH PZR PORVs are in ARM LOW TEMP.

If 2SX007, Unit 2 CC Hx SX Outlet Valve, failed closed, which of the following would occur FIRST?

- a. 2CC130A & B, Letdown Hx Outlet Temperature Control Valves, would throttle closed.
- b. 2CV131, Letdown Line Pressure Control Valve, would throttle open.
- c. 2RY456, PZR PORV, would open.
- d. 2B CC Pump would auto start.

QUESTION: 054 (1.00)

Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- Unit 2 station air compressor (SAC) is supplying ALL instrument and service air loads.
- The remaining two SACs are in standby.
- A four inch diameter turbine building SERVICE AIR header ruptures.

Which of the following describes the plant response?

- a. BOTH units will trip due to an IMMEDIATE loss of instrument air header pressure.
- b. BOTH units will trip, but only after the instrument air header depressurizes due to instrument air loads.
- c. ONLY unit 2 will trip due to an IMMEDIATE loss of instrument air header pressure.
- d. ONLY unit 2 will trip, but only after the instrument air header depressurizes due to instrument air loads.

QUESTION: 055 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- Annunciator 1-5-B7, CNMT Phase A Isolation, alarms.
- SER point 0017, CNMT Phase A Isolation Train A, is printed.

Which of the status lights listed below would be LIT as a DIRECT result of the Phase A signal?

- a. Group 1 MLB 5, light 1.4 (1SI8808D closed)
- b. Group 2 MLB 6, light 4.1 (1SI8801A open)
- c. Group 3 MLB 4, light 5.4 (1CV8100 closed)
- d. Group 6 MLB 1, light 6.3 (1CC9414 closed)

QUESTION: 056 (1.00)

Given:

- Unit 2 is at 100% power.
- All systems are normally aligned.
- PZR level control selector switch is in 459/461 position.
  
- A reference leg leak develops in PZR level transmitter 2LT-459.
- No ESF actuations occur as a result of the reference leg leak.

With no operator action, VCT level will

- a. lower and be maintained at 37% - 55% throughout event.
- b. rise and be maintained at 73% - 95% throughout event.
- c. lower to 5% and cause CV pump suction to swap over to the RWST.
- d. rise to 73% - 95%, then lower and be maintained at 37% - 55%.



QUESTION: 057 (1.00)

Given:

- Unit 1 experienced a large break RCS LOCA.
- The operators have transitioned to 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, and are currently aligning RH pump suctions to the containment sumps per step 3.
- Both SR channels are energized.
- Core downcomer voiding is occurring.
- The STA reports a YELLOW path on the sub-criticality status tree with an end path of 1BwFR-S.2, RESPONSE TO LOSS OF CORE SHUTDOWN.

Which of the following statements describes the IMMEDIATE result that voiding in the downcomer region would have on the Source Range instrumentation and the procedure used to mitigate these plant conditions?

- a. The displacement of water would increase the neutron leakage and result in a higher SR count rate; the crew will continue on in 1BwEP ES-1.3 to align RH pumps and refill the downcomer.
- b. A decrease in water density would reduce fission and result in a lower SR count rate; the crew will IMMEDIATELY implement 1BwFR-S.2 to add boron to compensate for lower water density .
- c. The displacement of boron would increase fission and result in a higher SR count rate, the crew will IMMEDIATELY implement 1BwFR-S.2 to add boron to counteract the fission rise.
- d. The location of the SR detectors effectively shields the effects of voiding and results in no change in SR count rate, the crew will continue on in 1BwEP ES-1.3 to align RH pumps for long term cooling.

## QUESTION: 058 (1.00)

Inadvertent draining of the spent fuel pool is prevented by . . .

- a. an automatic trip of the spent fuel cooling pumps when the leak detection system alarms.
- b. cooling pump discharge piping that has a hole 4 inches below the normal water level.
- c. a transfer canal gate interlock that prevents opening the sluice gate if spent fuel pool level is less than transfer canal level.
- d. cooling pump suction piping that extends to 6 feet above active fuel.

## QUESTION: 059 (1.00)

A loss of power to 0AR039J, Fuel Handling Building Crane Radiation Monitor, will prevent. . .

- a. upward AND lateral crane motion.
- b. downward AND lateral crane motion.
- c. ONLY upward crane motion.
- d. ONLY downward crane motion.

QUESTION: 060 (1.00)

Given:

- Unit 1 is at 4% power.
- All systems are properly aligned for the current power level.
  
- 1PI-507, MS Header Pressure, is indicating 1092 psig.
- 1PK-507, MS Header Pressure Controller, is in Auto with a potentiometer setting of 7.28.
- 1PK-507 demand is 16%.
- 1UI-500, Steam Dump Demand, is 16% .

If the 1PK-507 potentiometer setting is raised to 7.4, what will be the INITIAL plant response?

- a. 1PI-507 will rise AND demand on BOTH 1PK-507 AND 1UI-500 will rise.
- b. 1PI-507 will lower, 1PK-507 demand will rise, and 1UI-500 will lower.
- c. 1PI-507 will rise, 1PK-507 demand will rise, and 1UI-500 will lower.
- d. 1PI-507 will rise AND demand on BOTH 1PK-507 AND 1UI-500 will lower.

QUESTION: 061 (1.00)

Which of the following components is operated at 0OG01J, Off Gas Local Control Panel?

- a. 1OG028B, 1B GS Condenser Exhauster Inlet Valve.
- b. 2OG03P, U-2 Priming Vacuum Pump.
- c. 1OG044A, Hogging Vacuum Pump 1 Inlet Valve.
- d. 0OG01P, U-0 Hogging Vacuum Pump.

QUESTION: 062 (1.00)

While performing 0BwOSR 0.1-0, UNIT COMMON ALL MODES/AT ALL TIMES SHIFTLY AND DAILY OPERATING SURVEILLANCE, the following readings are recorded:

- 0AT-GW8000, hydrogen analyzer = 4.8%.
- 0AIT-GW8003, oxygen analyzer = 6.1%.
- 0AIT-GW004, GW compressor discharge oxygen analyzer = 1.8%.

What actions, if any, are required?

- a. Waste gas operation can continue provided oxygen concentration is restored within limits in 48 hours.
- b. IMMEDIATELY suspend all additions of waste gas to the system and restore oxygen concentration within limits in 48 hours.
- c. IMMEDIATELY suspend all additions of waste gas to the system OR take and analyze grab samples every 24 hours.
- d. Waste gas operation can continue without any additional action.

QUESTION: 063 (1.00)

Given:

- Unit 1 is at 100% power.
- Loop 1C NR Thot instrument channel is failed as is.
- A reactor trip occurs.
- 1A reactor trip breaker (RTA) remains closed and CANNOT be opened.

Based on the above indications, RCS temperature will be maintained at:

- a. 550°F
- b. 557°F
- c. 560°F
- d. 561°F

## QUESTION: 064 (1.00)

Given:

- Unit 1 is at 100% power.
- All systems are normally aligned.
- 1A SX pump is running, 1B SX pump is in standby.
  
- A loss of DC bus 112 occurs.
  
- The operating crew manually trips the reactor.
- One minute after the reactor trip, an SI occurs.
  
- Ten seconds have elapsed since the SI actuation.

Based on the above conditions, the 1B SX pump . . .

- a. is NOT running, but can be started in the MCR.
- b. automatically started on the SI actuation.
- c. will auto start in 15 seconds.
- d. is NOT running and CANNOT be started in the MCR.

## QUESTION: 065 (1.00)

During a surveillance run of the 1A MOTOR DRIVEN Auxiliary Feedwater Pump, the following conditions are noted:

- The NLO at the scene reports electrical arcs and flames coming from the 1A AF pump motor housing.
- The 1A AF pump breaker has tripped open.

Which of the fire protections subsystems listed below will be used to extinguish the fire in the 1A AF pump motor?

- a. Local Hose Station
- b. Manual Foam Deluge
- c. Automatic Halon
- d. Automatic CO<sub>2</sub>

## QUESTION: 066 (1.00)

An NSO has been off for the past seven days and is preparing for turnover on Unit 2. Before the oncoming NSO can assume the duties of the Unit 2 NSO, the oncoming NSO must review the control room logs back through . . .

- a. ONLY the previous shift.
- b. ONLY the previous day.
- c. ONLY the preceding four days.
- d. the last time the NSO had Unit 2 duties.

## QUESTION: 067 (1.00)

Given:

- Unit 2 is at 100% power, all systems are normally aligned.
- The Unit 2 NSO must attend a briefing in the MCR back panel area for an upcoming activity.
- The briefing is expected to last 35 minutes.
- An extra on-shift NSO has been assigned to relieve the Unit 2 NSO.

Based on the above information, which of the following describes the MINIMUM turnover requirements that must be performed by the NSOs per OP-AA-112-101, SHIFT TURNOVER AND RELIEF?

- a. Review the current shift turnover sheet and update any deviations of plant status or activities from the current shift turnover sheet.
- b. Review the current Unit 2 operating logs and perform a tour of the Unit 2 MCR boards.
- c. Perform a complete turnover, including initiating a new shift turnover sheet.
- d. Confer with the Unit 2 Unit Supervisor to determine the scope of planned shift activities and responsibilities.

QUESTION: 068 (1.00)

Given:

- A plant transient occurred requiring implementation of emergency procedures.
- An NSO has been directed to start a component using a BwOP as directed in the emergency procedure in progress.
- A limitation and action in the BwOP CANNOT be verified due to current plant conditions.

Based on the above information, the . . .

- a. NSO can immediately start the component as long as the NSO verifies the limitations and actions at a later time.
- b. Shift Manager shall grant permission to bypass the limitation and action prior to starting the component.
- c. NSO can immediately start the component since emergency procedures take precedence over BwOPs.
- d. Unit Supervisor must initiate a procedure change and the procedure change must be completed prior to starting the component.

QUESTION: 069 (1.00)

Given: BOTH Unit 1 and Unit 2 are at 100% power, MOL.

Condition 1: A large break RCS LOCA occurs on BOTH Units.

Condition 2: A large steamline break occurs on BOTH Units.

Which of the following correctly describes the response of both Units' containment pressure to the conditions listed above?

- a. During BOTH conditions, Unit 1 containment pressure would peak at a higher value than Unit 2.
- b. During the RCS LOCA, Unit 1 containment pressure would peak at a higher value than Unit 2. During the steamline break, Unit 1 containment pressure would peak at a lower value than Unit 2.
- c. During the RCS LOCA, Unit 1 containment pressure would peak at a lower value than Unit 2. During the steamline break, Unit 1 containment pressure would peak at a higher value than Unit 2.
- d. During BOTH conditions, Unit 1 containment pressure would peak at a lower value than Unit 2.

QUESTION: 070 (1.00)

Concerning Unit differences in the MCR, which of the following controls/indications are located ONLY on the Unit 1 main control boards?

- a. FW043A-D, FW Isolation Bypass Valves, control switches.
- b. ACB 0451, RSH Transformer Feed to 4KV Bus 045, control switch.
- c. Boric Acid Transfer Pump 0 connected indicating light.
- d. 0 CC Pump amps indication.



## QUESTION: 071 (1.00)

Given:

- A male radiation worker at Braidwood Station returned 3 weeks ago from outage support at LaSalle Station.
- His Total Effective Dose Equivalent (TEDE) received at LaSalle was 150 mrem.
- As a result of an injury, the worker had an ankle x-ray one week ago estimated at 10 mrem exposure to the ankle.
- The worker's current TEDE from Braidwood for this year is 75 mrem.

Based on the above information, what is the calculated MAXIMUM annual non-emergency TEDE that he can receive at Braidwood for the remainder of this year without exceeding the Federal Exposure Limits?

- a. 4765 mrem
- b. 4775 mrem
- c. 4850 mrem
- d. 4925 mrem

## QUESTION: 072 (1.00)

Given:

- A Unit 1 Containment Release package is in progress per BwRP 6110-13T1, CONTAINMENT RELEASE FORM.

While performing the release package, ALL of the following are an NSO responsibility EXCEPT . . .

- a. performing 1BwOS RETS 2.2.B-1, Radioactive Gaseous Effluent Monitoring Instrumentation Surveillance.
- b. ensuring plant ventilation is properly aligned to support the release.
- c. recording the affected Containment Pressure prior to initiating the release.
- d. placing the Gaseous Release in Progress placard on OPM02J.

## QUESTION: 073 (1.00)

Given:

- A Gas Decay Tank (GDT) in storage has been determined to contain greater than 50,000 Curies activity.

Which of the following correctly describes the method of lowering the affected GDT activity per 0BWOA RAD-3, DECAY TANK HIGH ACTIVITY?

- a. Leave the affected GDT in storage until its activity level lowers via decay.
- b. Transfer a portion of the affected GDT contents to another GDT.
- c. Dilute the affected GDT with nitrogen to lower its activity level.
- d. Immediately release the affected GDT to the environment.

## QUESTION: 074 (1.00)

Given:

- A major plant transient is in progress and numerous MCR annunciators are alarming.
- Plant conditions are rapidly deteriorating.

Which of the following describes the requirement for annunciator response during this transient per OP-AA-103-102, WATCHSTANDING PRACTICES?

- a. The operators should take actions to stabilize the plant, then announce annunciators and reference BwARs as conditions stabilize.
- b. The operators should announce alarms to the Unit Supervisor AND reference BwARs for alarms, then perform BwAR directed actions to stabilize the plant.
- c. The operators should take actions to stabilize the plant. After stabilizing the plant, requirements for annunciator announcement and BwAR usage are NOT applicable.
- d. The operators should announce alarms to the Unit Supervisor using three way communication prior to taking actions to stabilize the plant.

QUESTION: 075 (1.00)

Given:

- Unit 2 was at 100% power.
- All systems are normally aligned.
- An ATWS occurred concurrent with a loss of heat sink.
- The SM determined the INITIAL classification of the event is a General Emergency.
- The SM instructs the Unit 1 assist NSO to perform state/local notifications.

The preferred method of contacting state/local authorities will be the . . .

- a. ENS phone.
- b. commercial line.
- c. NARS phone.
- d. IL State Decision-Makers Hotline.

QUESTION: 076 (1.00)

Given

- Unit 1 is at 100% power.
- All systems are normally aligned.
- PZR pressure channel 1PT-456 fails high.
  
- The following indications exist on 1PM05J.
  - 1PI-455 is 2190 psig.
  - 1PI-456 is 2500 psig.
  - 1PI-457 is 2192 psig.
  - 1PI-458 is 2191 psig.
  - PZR PORV 1RY-455A is closed.
  - PZR PORV 1RY-456 is open.

Based on the above indications, which of the following Tech Specs must be entered?

- a. 3.3.2, ESFAS Instrumentation for the P-11 interlock, to ensure orderly cooldown and depressurization can be performed without SI or MSLI actuations.
- b. 3.3.4, Remote Shutdown Instrumentation, due to the inability to accurately monitor PZR pressure outside the MCR when the MCR is inaccessible.
- c. 3.4.12, Low Temperature Overpressure Protection System, to ensure the reactor vessel will be protected against exceeding low temperature pressure and temperature limits.
- d. 3.4.1, RCS DNB Limits, due to the increased likelihood of a fuel cladding failure in a DNB limited event.

QUESTION: 077 (1.00)

Given:

- BOTH Units are at 100% power.
- All systems normally aligned.
- BOTH Unit 1/2PR30J, Wide Range Gas Monitors, are inoperable.
- A Unit 2 SGTR occurred.
- Unit 2 operators manually tripped the Unit 2 reactor and actuated safety injection.
  
- Unit 2 operators have initiated a cooldown with the steam dumps per 2BwEP-3, STEAM GENERATOR TUBE RUPTURE, with the following indications:
  - VA019/020, Unit 1/2 Vent Stack Effluent Flow, are inoperable.
  - 0VA01JA and 0VA01JC flow indicators are inoperable.
  - 0VA01CA, 0A Aux Building Supply Fan, is running.
  - 0VA02CA, 0A Aux Building Exhaust Fan, is running.
  - 0VL02CB, 0B Lab Exhaust Fan, is running.
  - 0VW03CB, 0B Service Building and Solid Radwaste Fan, is running.
  - 0VF01CA, 0A Aux Building Filtered Vents Fan, is running.
  - 1PB128 is reading  $4.15 \text{ E-07 microCi/cc}$ .
  - 1PD428 is reading  $1.20 \text{ E-03 microCi/cc}$ .
  - 2PB128 is reading  $4.15 \text{ E-07 microCi/cc}$ .
  - 2PD428 is reading  $5.25 \text{ E-02 microCi/cc}$ .

Using the attached copies of BwZP 200-3 and BwZP 200-3A1, calculate the station total release rate.

The station total release rate is . . .

- a.  $4.20 \text{ E +01 microCi/sec}$ .
- b.  $1.21 \text{ E +05 microCi/sec}$ .
- c.  $2.38 \text{ E +05 microCi/sec}$ .
- d.  $3.60 \text{ E +05 microCi/sec}$ .

QUESTION: 078 (1.00)

Given:

- Unit 1 was at 100% power.
- All systems are normally aligned.
- A reactor trip and SI have occurred due to a steam break.
- ALL MSIVs failed to close.
  
- 1BwCA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL S/Gs, is in progress at step 5 with the following conditions:
  - AF flow rate is 45 gpm per SG due to required operator action.
  - ALL SG NR levels are 6%.
  - CNMT pressure has remained below 2 psig.
  - RCS pressure is 1350 psig.
  - High head SI flow (1FI-917) is 500 gpm.
  - CETCs are 495°F and RISING
  - ALL RCPs are running.

The STA has just informed the Unit Supervisor that a RED path condition exists on the Heat Sink status tree.

Based on the above indications, the crew will . . .

- a. Go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK. DO NOT implement 1BwFR-H.1. Return to 1BwCA-2.1 and trip the RCPs.
- b. continue on in 1BwCA-2.1 and DO NOT trip the RCPs
- c. IMMEDIATELY trip the RCPs. Go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK and implement 1BwFR-H.1.
- d. Go to 1BwFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK. Implement 1BwFR-H.1 and operate the RCPs per 1BwFR-H.1.

QUESTION: 079 (1.00)

Given:

- Unit 2 experienced a loss of all AC power.
- The crew has implemented 2BwCA-0.0, LOSS OF ALL AC POWER.
- The crew is unable to crosstie either Unit 2 4KV ESF bus to a Unit 1 4KV ESF bus.
- The crew is performing 2BwCA-0.0, attachment B step 20 with the following conditions:
  - Non-vital DC and AC instrument loads have been shed.
  - DC Bus 211 voltage is 105V.
  - DC Bus 211 current is 1200A.
  - DC Bus 212 voltage is 125V.
  - DC Bus 212 current is 100A.
  - DC Bus 111 voltage is 131V.
  - DC Bus 111 current is 8A.
  - DC Bus 112 voltage is 130.5V.
  - DC Bus 112 current is 10A.

Based on the above indications, the Unit Supervisor will direct the crew to . . . (2BwCA-0.0, BwOP DC-2T1-211, BwOP DC-2T1-212, BwOP DC-7-211 and BwOP DC-7 212 are attached.)

- a. crosstie DC Bus 211 to DC Bus 111 AND crosstie DC Bus 212 to DC Bus 112.
- b. shed DC Bus 211 AND DC Bus 212 discretionary loads.
- c. ONLY shed DC Bus 211 discretionary loads.
- d. ONLY shed DC Bus 212 discretionary loads.

QUESTION: 080 (1.00)

Given:

- Unit 1 was at 100% power, all systems normally aligned.
- A large break RCS LOCA occurred.
- 1BwEP-1, LOSS OF REACTOR OR SECONDARY COOLANT, has been implemented.
- The crew is performing 1BwEP-1, step 12, Check if RCS Cooldown and Depressurization is Required" with the following conditions:
  - RWST level is 62% and slowly lowering.
  - RCS pressure is 275 psig.
  - 1A & 1B RH pump flows (1FI-618/619) indicate 0 gpm.

Based on the above conditions, the NEXT procedure the Unit Supervisor will direct the crew to implement is . . .

- a. 1BwCA-1.3, SUMP BLOCKAGE CONTROL ROOM GUIDELINE
- b. 1BwEP ES-1.3, TRANSFER TO COLD LEG RECIRCULATION
- c. 1BwCA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION
- d. 1BwEP ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION



QUESTION: 081 (1.00)

Given:

- Unit 1 was at 50% power.
- 1A AF pump has been OOS for the last 58 hours.
  
- Two hours, ago a reactor trip occurred.
- 1B AF pump tripped shortly after starting due to a faulty speed sensor and could NOT be restarted.
- The crew entered 1BwEP-0, REACTOR TRIP OR SI, and transitioned to 1BwEP ES-0.1, REACTOR TRIP RESPONSE.
- While performing 1BwEP ES-0.1, a red path was encountered on the heat sink status tree.
- The crew transitioned to 1BwFR-H.1, LOSS OF SECONDARY HEAT SINK, tripped the RCPs and established FW flow with the startup FW pump.
- SG NR levels were restored and 1BwFR-H.1 was exited.
- RCS Tave is currently 557°F.

What actions are required by Tech Specs and what is the bases for those actions?

- a. IMMEDIATELY restore an RCP to operation to ensure adequate boron mixing AND IMMEDIATELY initiate action to restore one AF pump to operable status to ensure adequate core decay heat removal.
- b. Within 12 hours, EITHER restore one AF pump to operable status OR be in Mode 4 to ensure adequate RCS dilution occurs in the event of a SGTR.
- c. IMMEDIATELY initiate action to place rod control in a condition incapable of rod withdrawal to provide protection from a postulated power excursion from inadvertent rod withdrawal.
- d. Within 12 hours, EITHER start an RCP OR be in Mode 4 to ensure adequate core decay heat removal and adequate boron mixing.

## QUESTION: 082 (1.00)

Given:

- Unit 1 is at 8% power.
- Annunciator 1-10-B2, IR HI VOLT FAILURE, is lit.
- IR channel –35 reads  $2 \times 10^{-5}$  amps.
- IR channel –36 reads  $1 \times 10^{-11}$  amps.

Based on the above indications, one of the Tech Spec required actions and the reason for that action is to . . .

- a. immediately suspend operations involving positive reactivity additions since NEITHER IR detector is capable of monitoring core power level.
- b. restore the affected channel within 30 days to allow monitoring necessary to place and maintain Unit 1 in mode 3 from a location other than the MCR.
- c. raise reactor power above the P-10 setpoint within 2 hours to allow PR NI detectors to perform monitoring and protection functions.
- d. trip the bistables for the affected channel within 6 hours to ensure proper trip logic is established and maintained during subsequent operation.

## QUESTION: 083 (1.00)

With respect to the notification of outside (non-Exelon agencies), which of the following conditions would result in an event that is reportable ONLY to the NRC?

(Consider each event separately and assume operators perform ALL required actions and ALL systems function as designed.)

- a. While at 3% power, a 450 gpm SGTR occurs on Unit 2.
- b. While at 40% power, condenser vacuum is 7 in Hg.
- c. While at 50% power, the site is under a tornado watch for the next 4 hours.
- d. While at 90% power, Unit 1 RCS Dose Equivalent I-131 is 85 micro Curies/gram.

QUESTION: 084 (1.00)

Given:

- BOTH Units are at 100% power.

For which of the following events or conditions must the Plant Manager be notified in accordance with OP-AA-106-101, SIGNIFICANT EVENT REPORTING? (OP-AA-106-101 is attached)

- a. A scheduled IMD surveillance changes Unit 1 online risk from green to yellow.
- b. A mechanic alarms the Aux Building portal monitor. Rad Protection decontaminates the mechanic's hard hat and the mechanic is allowed to exit the Aux Building.
- c. An NLO cuts a finger while working in the Turbine Building. The NLO receives site medical care and is returned to duty.
- d. A system engineer reports BOTH Unit 2 containment emergency hatch doors are open and CANNOT be closed.

QUESTION: 085 (1.00)

Given:

- 1BwEP ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS), is in progress at step 2 with the following conditions:
  - Iconics subcooling indicates 0°F.
  - RCS pressure is 1400 psig and stable.
  - CETCs are 590°F and rising slowly.
  - PZR level is 36% and stable.
  - RVLIS plenum level is 100%.
  - RVLIS head level is 31%.
  - Containment pressure is 0.3 psig.
- Normal charging and letdown are in service.
- Bus 143 and 144 are energized and the main condenser is available.
- Buses 156 - 159 are energized.
- Conditions for starting RCPs have been established per 1BwOA ESP-1, RCP STARTUP DURING ABNORMAL CONDITIONS.

Based on the above conditions, the Unit Supervisor will direct the crew to . . .  
(1BwEP ES-0.3 is attached)

- a. actuate SI and transition to 1BwEP-0, REACTOR TRIP OR SAFETY INJECTION.
- b. start the 1D RCP and transition to 1BwGP 100-5, PLANT SHUTDOWN AND COOLDOWN.
- c. raise PZR level by adjusting charging and/or letdown flow(s).
- d. throttle open steam dumps.

QUESTION: 086 (1.00)

Given:

- Unit 1 is at 20% power.
- All systems are normally aligned.
- PZR pressure is 2205 psig and lowering.
- 1RY455C, PZR Spray Valve, is open and cannot be operated in manual OR auto.
- All other PZR system components are operating as designed.

Based on the above indications, the Unit Supervisor will direct the crew to . . .

- a. manually trip the reactor and stop the 1D RCP.
- b. manually trip the reactor and stop the 1C RCP.
- c. stop the 1C RCP and verify all PZR heaters energized.
- d. stop the 1D RCP and verify all PZR heaters energized.

QUESTION: 087 (1.00)

Given:

- Unit 1 is at 85% power.
- All systems are normally aligned.
- An EH leak develops in the turbine building.
- The 1B FW pump trips due to the EH leak.
- Prior to any operator action being taken, the EH leak causes the 1C FW pump to trip.

The Unit Supervisor will direct the crew to . . .

- a. manually trip the reactor.
- b. start the 1A FW pump.
- c. initiate a turbine runback.
- d. start a standby CD/CB pump.

QUESTION: 088 (1.00)

Given:

- Both Units are at 100% power

Source #1 - 345 KV system to buses 141 & 142 from Unit 1 SATs.  
Source #2 - 345 KV system to buses 141 & 142 from Unit 2 SATs via crosstie.  
Source #3 - BOTH Unit 1 DGs.  
Source #4 - BOTH Unit 2 DGs.

Which combination of the AC sources listed above satisfies the requirements of LCO 3.8.1 - AC Sources - Operating for Unit 1?

- a. ONLY Source #1 AND Source #2.
- b. ONLY Source #1 AND Source #3.
- c. ONLY Source #2, Source #3, AND Source #4
- d. ONLY Source #1, Source #2, AND Source #3.

## QUESTION: 089 (1.00)

Given:

- Unit 1 is in Mode 6.
- During performance of 1BwOSR 3.8.1.10-1, 1A DG FULL LOAD REJECTION AND SIMULATED SI IN CONJUNCTION WITH UV DURING LOAD TEST, the following occurred:
  - 1A DG was manually started.
  - A manual SI signal was actuated.
  - ACB 1412, SAT 142-1 Feed to 4 KV Bus 141, was manually opened.
  - ACB 1413, DG Feed to 4 KV Bus 141, automatically closed.
- The following components start times were noted:
  - 1A CV Pump 0 seconds
  - 0A VC Chiller 0 seconds
  - 1A SI Pump 5 seconds
  - 1A CC Pump 20 seconds
  - 1A SX Pump 25 seconds
  - 1A AF Pump 35 seconds
  - 1A CS Pump did NOT start.

Based on the above indications . . .

- a. 1A CV Pump did NOT respond properly.
- b. 0A VC Chiller did NOT respond properly.
- c. 1A CS Pump did NOT respond properly.
- d. ALL listed equipment responded properly.

QUESTION: 090 (1.00)

Given:

- Unit 1 is at 33% power and stable.
- RCS Tave is 566°F and stable.
- Turbine power is 30% and stable.
  
- PZR level is 20% and lowering.
- PZR pressure is 2150 psig and lowering.
- Containment pressure is 2 psig and rising.

If containment pressure continues to rise to the CS actuation setpoint, the CS pumps may be secured . . .

- a. once CNMT pressure lowers below 15 psig. No requirement applies for CS spray add tank level OR CS pump run time.
- b. once CNMT pressure lowers below 15 psig if the CS pumps have run at least 2 hours AND the CS spray add tank LO-2 level lights are lit.
- c. after the CS pumps have run at least 2 hours if the CS spray add tank LO-2 level lights are lit. No requirement applies for CNMT pressure.
- d. once CNMT pressure lowers below 15 psig and the CS spray add tank LO-2 level lights are lit. No requirement applies for CS pump run time.



QUESTION: 091 (1.00)

Given:

- Unit 1 is at 100% power, all systems normally aligned.
- The Unit 1 assist NSO has just completed the operability check of the Unit 1 Incore Temperature Monitoring System (CETCs) with the following results:
  - Train A has 19 operable CETCs.
  - Train B has 21 operable CETCs.
  - Quadrant 1 has 3 of 15 CETCs operable.
  - Quadrant 2 has 10 of 12 CETCs operable.
  - Quadrant 3 has 12 of 15 CETCs operable.
  - Quadrant 4 has 15 of 17 CETCs operable.

Based on the above indications, the Unit Supervisor will . . .  
(LCO 3.3.3, TLCO 3.3.h, and TLCO 3.3.i are attached)

- a. enter LCO 3.3.3, Post Accident Monitoring Instrumentation, because non uniform core conditions CANNOT be adequately monitored.
- b. enter TLCO 3.3.h, Power Distribution Monitoring System Instrumentation, because peak linear heat rate CANNOT be continuously monitored.
- c. enter TLCO 3.3.i, Post Accident Monitoring Instrumentation, because the Reactor Coolant Subcooling Margin Monitor is NOT operable.
- d. NOT enter ANY LCO or TLCO concerning the CETCs.

QUESTION: 092 (1.00)

Given:

- Unit 1 is in Mode 6.
- A fuel load is in progress following a complete core off load.

Which of the following conditions require an IMMEDIATE suspension of core alterations?

- a. The last 2 RCS boron samples were 2340 ppm and 2335 ppm respectively.
- b. SR channel -31 changes from 3 cps to 9 cps following the insertion of the 6th assembly into the core.
- c. RCS temperature changes from 110°F to 106°F in 30 minutes due to an RH problem.
- d. BOTH SR channels change from 12 cps to 26 cps following the insertion of the 15th fuel assembly into the core.

QUESTION: 093 (1.00)

Given:

- Unit 1 is at 90% power.
- All systems are normally aligned.
- Chemistry has just notified the MCR that secondary chemistry is abnormal due to a condenser tube leak.
- SG sodium is exceeding the Action Level 3 limit.

Given the above information, how should the crew proceed?

- a. Hold power at its current level until SG sodium is restored within Action Level 1 limit.
- b. Restore SG sodium below Action Level 3 in 7 days OR place Unit 1 in mode 3 within the following 6 hours.
- c. Restore SG sodium below Action Level 3 in 24 hours OR place Unit 1 in mode 3 within the following 6 hours.
- d. Shutdown Unit 1 to mode 3 within the next 6 hours.

QUESTION: 094 (1.00)

Given:

- BOTH Units are at 100% power.
- All systems are normally aligned.
- 0BwOA ELEC-1, ABNORMAL GRID CONDITIONS, was entered as the result of a state estimator alarm due to a predicted condition if BRAIDWOOD UNIT 2 tripped.
- The state estimator predicted voltage is 344.4 KV for both units.
- The following indication exist:
  - Bus 143 voltage is 4350 volts. -
  - Bus 143 current is 700 amps.
  - Bus 144 voltage is 4300 volts. -
  - Bus 144 current is 635 amps.
  - Bus 243 voltage is 4280 volts. -
  - Bus 243 current is 845 amps.
  - Bus 244 voltage is 4300 volts. -
  - Bus 244 current is 700 amps.

Based on the above conditions, the crew will...

(0BwOA ELEC-1 is attached)

- a. NOT enter LCO 3.8.1 for EITHER Unit 1 OR Unit 2.
- b. enter LCO 3.8.1 for BOTH Unit 1 AND Unit 2.
- c. enter LCO 3.8.1 for Unit 1 ONLY.
- d. enter LCO 3.8.1 for Unit 2 ONLY.

## QUESTION: 095 (1.00)

Given:

- While performing a review of a Tech SPec required valve stroke time surveillance, the Unit Supervisor recalls that the valve actuator had been replaced during the last refueling outage which resulted in a new valve stroke time.
- The Unit Supervisor discovers that the procedure has NOT been revised to reflect the new valve stroke time acceptance criteria.
- The System Engineer confirms the acceptance criteria should have been changed when the work package was closed out.

Based on the above, the Unit Supervisor will . . .

- a. initiate a permanent procedure change to the surveillance.
- b. note the deficiency and approve the surveillance results.
- c. initiate a temporary procedure change to the surveillance.
- d. initiate an interim procedure change to the surveillance.

## QUESTION: 096 (1.00)

Which of the following activities is considered production risk per WC-AA-104, REVIEW AND SCREENING FOR PRODUCTION RISK?

(WC-AA-104 and station production risk matrix is attached)

- a. EMD is repairing the 1A GC pump breaker in the EMD shop.
- b. System engineer is verifying FW flow constants in the plant computer.
- c. IMD is calibrating Unit 2 IA dryer purge timer under a clearance order.
- d. Operations personnel are replacing 2B SSPS train ground return fuse in the EER.

QUESTION: 097 (1.00)

Given:

- BOTH Units are at 100% power.
- A release package has been requested for 0F GDT.
- 0PR02J, Gas Decay Tank Effluent Monitor, was declared inoperable last shift.
- All required TS/TRM/RETS have been entered.

The release can be commenced. . .

- a. provided verification of sample results, valving, and release rate are performed prior to initiating the release.
- b. provided two independent samples are gathered and analyzed during the release.
- c. provided samples are continuously collected by auxiliary sampling equipment during the release.
- d. provided the effluent flow rate is estimated every 4 hours during the release.

QUESTION: 098 (1.00)

Given:

- Unit 1 has experienced an event requiring Emergency Plan implementation.
- Personnel are preparing to enter Unit 1 curved wall area (CWA) to rescue an injured worker.
- The rescuers are expected to receive 10 Rem exposure during the rescue

Which of the individuals listed below must authorize the emergency exposure?

- a. Corporate Emergency Director
- b. Station Emergency Director
- c. Rad Protection Manager
- d. OSC Director

QUESTION: 099 (1.00)

Given:

- Unit 1 is in Mode 5, preparing for a fuel off load.
- Unit 1 has been shutdown for 7 days.
- ALL loops are isolated.
- 1B RH pump is operating in shutdown cooling when the following occurs:
  - The 1B RH pump trips.
  - 1A RH pump will NOT start.
- The crew enters 1BwOA PRI-10, LOSS OF RH COOLING and initiates bleed and feed per Attachment C.
- The crew is preparing to commence makeup flow to the RCS per 1BwOA PRI-10, Attachment C, step 7 with the following conditions:
  - BOTH PZR PORVs are open.
  - CETCs are 130°F.
  - RVLIS is 100% on both trains' head and plenum.
  - RCS pressure is 90 psig.
  - RWST level is 91%.

Based on the above indications, the Unit Supervisor will direct the crew to establish a MINIMUM RCS makeup flow of . . .

- a. 60 gpm.
- b. 80 gpm.
- c. 520 gpm.
- d. 710 gpm.

QUESTION: 100 (1.00)

Given:

- Unit 1 experienced a small break RCS LOCA with a total loss of ALL ECCS pumps.
- EAL FG1 was declared 2 minutes ago.
- 1BwFR-C.2, RESPONSE TO DEGRADED CORE COOLING, has been in progress for the past 20 minutes.
- The TSC is NOT staffed yet and offsite dose calculations are NOT available.
- A controlled direct CNMT vent has NOT occurred.
- No releases are occurring.
- The CNMT is intact.
- CNMT rad levels (1AR020/021) are 505 R/hr.
- CNMT pressure is 12 psig.
- CETC's are 755°F and have slowly risen over the past 20 minutes.
- RVLIS plenum level is 0%.

Based on current plant conditions, the results of determining the Protective Action Recommendations (PARs) will be . . .

(EP-AA-111-F-02 and EP-AA-1001 are attached)

- a. no PARs currently exist.
- b. shelter 2 mile radius and 5 miles downwind.
- c. evacuate 5 mile radius and 10 miles downwind.
- d. evacuate 2 mile radius and 5 miles downwind.

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

ANSWER: 001 (1.00)

b.

REFERENCE:

1BwEP ES-0.1 BWD ILT LP I1-XL-EP-01

Modified

Higher

000007EK1.02 ..(KA's)

ANSWER: 006 (1.00)

a.

REFERENCE:

ILT LP I1-CV-XL-01

New

Higher

000022AK1.02 ..(KA's)

ANSWER: 002 (1.00)

a.

REFERENCE:

2BwEP-0 ILT LP I1-EP-XL-01

New

Fundamental

2.1.23 000008 ..(KA's)

ANSWER: 007 (1.00)

c.

REFERENCE:

1BwCA-1.3 BWD ILT LP I1-CA-XL-02A

New

Higher

000025AK2.05 ..(KA's)

ANSWER: 003 (1.00)

a.

REFERENCE:

1BwOA PRI-6 BWD ILT LP I1-OA-XL-17

New

Higher

000009EA2.03 ..(KA's)

ANSWER: 008 (1.00)

d.

REFERENCE:

1BwOA PRI-6 ILT LP I1-CC-XL-01

New

Higher

000026AA1.06 ..(KA's)

ANSWER: 004 (1.00)

b.

REFERENCE:

1BwEP ES-1.3

New

Higher

000011EK2.02 ..(KA's)

ANSWER: 009 (1.00)

b.

REFERENCE:

ILT LP I1-RP-XL-01

Modified

Higher

000029EK2.06 ..(KA's)

ANSWER: 005 (1.00)

a.

REFERENCE:

1BwFR-C.1 WOG background document for  
FR-C BWD LP I1-FR-XL-02

Bank

Higher

000015AA2.11 ..(KA's)

ANSWER: 010 (1.00)

b.

REFERENCE:

ILT LP I1-ES-XL-01 ILT LP I1-MS-XL-01

New

Fundamental

000040AK3.03 ..(KA's)



ANSWER: 011 (1.00)

b.

REFERENCE:

ILT LP I1-AF-XL-01 1BwEP-0

New

Fundamental

000054AA1.01 ..(KA's)

ANSWER: 012 (1.00)

a.

REFERENCE:

T.S. 3.8.2

New

Fundamental

2.1.33 000056 ..(KA's)

ANSWER: 013 (1.00)

b.

REFERENCE:

1BwOA ELEC-2 ILT LP I1-AF-XL-01

New

Fundamental

2.1.30 000057 ..(KA's)

ANSWER: 014 (1.00)

c.

REFERENCE:

1BwOA ELEC-1 ILT LP I1-DC-XL-01 ILT LP  
I1-NI-XL-03

New

Fundamental

000058AA1.03 ..(KA's)

ANSWER: 015 (1.00)

c.

REFERENCE:

1BwOA PRI-8

New

Higher 000062AA2.06 ..(KA's)

ANSWER: 016 (1.00)

d.

REFERENCE:

ILT LP I1-CA-XL-02 WOG background  
document for CA-1.2

New

Fundamental

00WE04EK3.3 ..(KA's)

ANSWER: 017 (1.00)

a.

REFERENCE:

ILT LP I1-CA-XL-02 WOG background  
document for CA-1.1

Bank

Fundamental

00WE11EK3.3 ..(KA's)

ANSWER: 018 (1.00)

d.

REFERENCE:

ILT LP I1-FR-XL-03 WOG background  
document for FR-H.1

New

Higher

00WE05EK1.1 ..(KA's)

ANSWER: 019 (1.00)

c.

REFERENCE:

ILT LP I1-OA-XL-34 1BwOA ROD-3

Bank

Higher

2.1.2 000003 ..(KA's)

ANSWER: 020 (1.00)

d.

REFERENCE:

ILT LP I1-CV-XL-02 ILT LP I1-RY-XL-01 ILT  
LP I1-RD-XL-01

New

Higher

000024AK1.01 ..(KA's)

ANSWER: 021 (1.00)

a.

REFERENCE:

ILT LP I1-AR-XL-01 BwAR 1-1PR03J

New

Fundamental

000059AK3.03 ..(KA's)

ANSWER: 022 (1.00)

b.

REFERENCE:

ILT LP I1-AR-XL-01 BwAR 4-0AR055J

Bank

Fundamental

000060AK2.02 ..(KA's)

ANSWER: 023 (1.00)

d.

REFERENCE:

ILT LP I1-AF-XL-01 BwOP AF-7

20E-1-4030AF02, 12, & 13

New

Higher

000067AA2.16 ..(KA's)

ANSWER: 024 (1.00)

d.

REFERENCE:

ILT LP I1-FR-XL-02 1BwFR-C.2 WOG

background document for C.2

New

Fundamental

00WE06EK3.1 ..(KA's)

ANSWER: 025 (1.00)

c.

REFERENCE:

1BwOA REFUEL-1 ILT LP I1-XL-29

New

Fundamental

2.1.14 00WE16 ..(KA's)

ANSWER: 026 (1.00)

c.

REFERENCE:

ILT LP I1-EP-XL-02 WOG background

document for ES-1.2

New

Higher

00WE03EA1.2 ..(KA's)

ANSWER: 027 (1.00)

a.

REFERENCE:

1BwEP ES-0.2 ILT LP I1-EP-XL-01

Bank

Fundamental

00WE10EK1.1 ..(KA's)

ANSWER: 028 (1.00)

c.

REFERENCE:

ILT LP I1-RC-XL-02 ILT LP I1-AP-XL-01

New

Higher

003000K2.01 ..(KA's)

ANSWER: 029 (1.00)

c.

REFERENCE:

ILT LP I1-OA-XL-27 1BwOA RCP-1

New

Higher

003000A4.06 ..(KA's)

ANSWER: 030 (1.00)

b.

REFERENCE:

ILT LP I1-CV-XL-01 2BwOA ELEC-2

20E-2-4012D 20E-2-4031CV26, 27, 33, & 36,

New

Higher

004000K2.06 ..(KA's)

ANSWER: 031 (1.00)

c.

REFERENCE:

ILT LP I1-CV-XL-01 TS 3.5.5 and Bases  
1BwOSR 3.5.5.1

New

Higher

004000K6.31 ..(KA's)

ANSWER: 036 (1.00)

a.

REFERENCE:

1BwEP-1 ILT LP I1-RC-XL-02 ILT LP  
I1-EP-XL-01

New

Fundamental

008000K3.03 ..(KA's)

ANSWER: 032 (1.00)

d.

REFERENCE:

BwOP RH-6

Bank

Higher

005000K5.03 ..(KA's)

ANSWER: 037 (1.00)

a.

REFERENCE:

ILT LP I1-RY-XL-01 BwOP RY-11

Bank

Fundamental

010000K4.01 ..(KA's)

ANSWER: 033 (1.00)

a.

REFERENCE:

ILT LP I1-RH-XL-01 BwAR 2-6-B1 BwAR  
2-6-C1 2BwOA PRI-10

New

Higher

005000A4.01 ..(KA's)

ANSWER: 038 (1.00)

b.

REFERENCE:

I1-RP-XL-02 TS 3.3.1 Bases BwAR 1-10-C5  
BwAR 1-11-B4

New

Higher

012000K6.11 ..(KA's)

ANSWER: 034 (1.00)

a.

REFERENCE:

ILT LP I1-CV-XL-01 20E-1-4030CV16

New

Higher

006000K4.24 ..(KA's)

ANSWER: 039 (1.00)

d.

REFERENCE:

I1-RP-XL-02 TS 3.3.1 and bases

Modified

Higher

2.2.25 012000 ..(KA's)

ANSWER: 035 (1.00)

c.

REFERENCE:

ILT LP I1-RY-XL-01 BwAR 1-12-B7 BwOP  
RY-4 BwOP RY-12 20E-1-4030RE01  
20E-1-4030RY17 & 18

New

Higher

007000A1.02 ..(KA's)

ANSWER: 040 (1.00)

d.

REFERENCE:

ILT LP I1-RP-XL-01 ILT LP I1-EF-XL-01  
System big note EF-2 BwARs 1-BP-3.1, 4.1,  
& 5.1

Bank

Higher

013000K3.02 ..(KA's)

ANSWER: 041 (1.00)

a.

REFERENCE:

1BwEP-0 I1-VP-XL-01

New

Fundamental

022000A3.01 ..(KA's)

ANSWER: 046 (1.00)

c.

REFERENCE:

BwOP FW-1, E.1 1BwOA SEC-1

New

Fundamental

059000A1.03 ..(KA's)

ANSWER: 042 (1.00)

c.

REFERENCE:

ILT LP I1-CC-XL-01 2BwOA PRI-6 BwARs

2-2-A5, 2-2-E4

New

Higher

2.4.50 022000 ..(KA's)

ANSWER: 047 (1.00)

c.

REFERENCE:

ILT LP I1-EP-XL-01 1BwEP-0, step 25 BwOP

CW-E1, RY-E1, & MS-E1 BwAR 1-BP-5.6

20E-1-4030CW01, CW02, CW03, & AP45

New

Higher

061000K5.01 ..(KA's)

ANSWER: 043 (1.00)

c.

REFERENCE:

ILT LP I1-CS-XL-01 2BwEP ES-1.3

New

Higher 026000A2.02 ..(KA's)

ANSWER: 048 (1.00)

d.

REFERENCE:

ILT LP I1-AP-XL-02 2BwOA ELEC-4

20E-0-4030WS03 20E-0-4030WO01

20E-2-4030SA01

New

Higher

062000A2.11 ..(KA's)

ANSWER: 044 (1.00)

b.

REFERENCE:

ILT LP I1-MS-XL-01 BwAR 2-BP-3.3 BwAR

2-BP-4.2

New

Higher

039000K4.05 ..(KA's)

ANSWER: 049 (1.00)

c.

REFERENCE:

ILT LP I1-DG-XL-01 20E-1-4030DG01

New

Higher

063000K2.01 ..(KA's)

ANSWER: 045 (1.00)

a.

REFERENCE:

LP I1-FW-XL-02 Systems big note EHC-6

New

Higher

039000A4.03 ..(KA's)

ANSWER: 050 (1.00)

b.

REFERENCE:

Systems big note SX-1 20E-1-4030SX17

New

Higher

064000K1.02 ..(KA's)

ANSWER: 051 (1.00)

c.

REFERENCE:

ILT LP I1-AR-XL-01 BwAR 1-0PR09J BwOP  
AR/PR-11T1 BwVP RM80-3-0PR09

New

Higher

073000A2.02 ..(KA's)

ANSWER: 056 (1.00)

d.

REFERENCE:

ILT LP I1-EF-XL-01 ILT LP I1-RY-XL-01 ILT  
LP I1-CV-XL-01 ILT LP I1-CV-XL-02

New

Higher

011000A1.03 ..(KA's)

ANSWER: 052 (1.00)

d.

REFERENCE:

ILT LP I1-AR-XL-01 1BwEP-0 BwAR  
2-0PR31J

New

Higher

2.4.50 073000 ..(KA's)

ANSWER: 057 (1.00)

a.

REFERENCE:

ILT LP I1-MI-XL-11

Bank

Higher

015000A2.05 ..(KA's)

ANSWER: 053 (1.00)

b.

REFERENCE:

ILT LP I1-RH-XL-01

New

Higher

076000K3.05 ..(KA's)

ANSWER: 058 (1.00)

b.

REFERENCE:

ILT LP I1-FC-XL-01 20E-1-4030FC01  
20E-2-4030FC01

New

Fundamental

033000K4.03 ..(KA's)

ANSWER: 054 (1.00)

b.

REFERENCE:

I1-SA-XL-01 Systems big note SA/IA-2

Bank

Higher

078000K1.02 ..(KA's)

ANSWER: 059 (1.00)

c.

REFERENCE:

ILT LP I1-AR-XL-01 20E-0-4709AS

Bank

Fundamental

034000K6.02 ..(KA's)

ANSWER: 055 (1.00)

c.

REFERENCE:

I1-AP-XL-23 1BwOA PRI-13  
20E-1-4030CC07, CV12, EF11, SI06, & SI12

New

Fundamental

103000A3.0 ..(KA's)

ANSWER: 060 (1.00)

d.

REFERENCE:

ILT LP I1-DU-XL-01 System big note MS-4

New

Higher

041000A3.05 ..(KA's)

ANSWER: 061 (1.00)

c.

REFERENCE:

ILT LP I1-OG-XL-01 20E-1-4030OG05  
20E-2-4030OG02 20E-0-4030OG01 M-47-1C  
New  
Fundamental  
2.1.30 055000 ..(KA's)

ANSWER: 062 (1.00)

b.

REFERENCE:

LP I1-GW-XL-01 0BwOSR 0.1-0 TRM  
appendix L  
New  
Fundamental  
071000A4.29 ..(KA's)

ANSWER: 063 (1.00)

a.

REFERENCE:

ILT LP I1-DU-XL-01  
New  
Higher  
016000K3.03 ..(KA's)

ANSWER: 064 (1.00)

d.

REFERENCE:

ILT LP I1-SX-XL-01 20E-1-4030SX02  
20E-1-4030AP39  
New  
Higher  
075000K2.03 ..(KA's)

ANSWER: 065 (1.00)

a.

REFERENCE:

I1-FP-XL-01 BwAP 1110-1, 1110-1T3  
New  
Fundamental  
086000K1.03 ..(KA's)

ANSWER: 066 (1.00)

c.

REFERENCE:

OP-AA-112-101  
Bank  
Fundamental  
2.1.3 194001 ..(KA's)

ANSWER: 067 (1.00)

a.

REFERENCE:

OP-AA-112-101  
New  
Fundamental  
2.1.31 194001 ..(KA's)

ANSWER: 068 (1.00)

b.

REFERENCE:

BwAP 340-1 HU-AA-104-101  
New  
Fundamental  
2.1.32 194001 ..(KA's)

ANSWER: 069 (1.00)

b.

REFERENCE:

1/2BwEP ES-0.2 Systems big note SG-2  
New  
Higher  
2.2.3 194001 ..(KA's)

ANSWER: 070 (1.00)

b.

REFERENCE:

20E-0-4030AP15 20E-1/2-4030AB01  
20E-1/2-4054A & B 20E-1/2-4050C, J, M, &  
Q 20E-1/2-4044B  
New  
Fundamental  
2.2.4 194001 ..(KA's)

ANSWER: 071 (1.00)

b.

REFERENCE:

RP-AA-203

Bank

Higher

2.3.1 194001 ..(KA's)

ANSWER: 076 (1.00)

d.

REFERENCE:

TS 3.3.3, 3.3.4, 3.4.11, and 3.4.1 and bases  
Unit 1 COLR 1BwOSR 3.3.4.1

New

Higher 000027AA2.15 ..(KA's)

ANSWER: 072 (1.00)

d.

REFERENCE:

BwRP 6110-13T1

New

Fundamental

2.3.9 194001 ..(KA's)

ANSWER: 077 (1.00)

d.

REFERENCE:

BwZP 200-3 BwZP 200-3A1

New

Higher

000038EA2.14 ..(KA's)

ANSWER: 073 (1.00)

b.

REFERENCE:

0BwOA RAD-3 0BwOA PRI-9

New

Fundamental

2.3.11 194001 ..(KA's)

ANSWER: 078 (1.00)

a.

REFERENCE:

ILT LP I1-FR-XL-03 1BwCA-2.1 1BwFR-H.1

Modified

Higher

2.4.49 00WE12 ..(KA's)

ANSWER: 074 (1.00)

a.

REFERENCE:

OP-AA-103-102, step 4.3

New

Fundamental

194001 2.4.31 ..(KA's)

ANSWER: 079 (1.00)

c.

REFERENCE:

ILT LP I1-CA-XL-01 2BwCA-0.0 BwOP

DC-2T1-211 BwOP DC-2T1-212 BwOP

DC-7-211/212

New

Higher

000055EA2.05 ..(KA's)

ANSWER: 075 (1.00)

c.

REFERENCE:

ILT LP I1-ZP-XL-01 EP-AA-114

EP-MW-114-100 EP-MW-114-100-F-01

Bank

Fundamental

2.4.39 194001 ..(KA's)

ANSWER: 080 (1.00)

d.

REFERENCE:

ILT LP I1-EP-XL-02 1BwEP-1

New

Higher

2.1.14 000011 ..(KA's)

ANSWER: 081 (1.00)

a.

REFERENCE:

ILT LP I1-RC-XL-01 ILT LP I1-AF-XL-01 TS  
3.4.5 and bases TS 3.7.5 and bases  
New  
Higher  
2.1.33 00WE05 ..(KA's)

ANSWER: 082 (1.00)

c.

REFERENCE:

TS 3.3.1 TS 3.3.4 ILT LP I1-NI-XL-02 1BwOA  
INST-1 BwAR 1-10-B2  
Bank  
Higher  
000033AA2.02 ..(KA's)

ANSWER: 083 (1.00)

b.

REFERENCE:

ILT LP I1-ZP-XL-01 EP-AA-1001 1BwOA  
SEC-3 0BwOA ENV-1 Tech Spec 3.4.16  
New  
Higher  
2.4.30 000051 ..(KA's)

ANSWER: 084 (1.00)

d.

REFERENCE:

OP-AA-106-101  
New  
Fundamental  
2.1.14 000069 ..(KA's)

ANSWER: 085 (1.00)

a.

REFERENCE:

ILT LP I1-EP-XL-01 1BwEP ES-0.3  
Bank  
Higher  
00WE09EA2.2 ..(KA's)

ANSWER: 086 (1.00)

b.

REFERENCE:

1BwOA INST-2 ILT LP I1-OA-XL-11  
New  
Higher  
010000A2.02 ..(KA's)

ANSWER: 087 (1.00)

a.

REFERENCE:

ILT LP I1-OA-XL-36 1BwOA SEC-1  
New  
Fundamental  
2.4.49 059000 ..(KA's)

ANSWER: 088 (1.00)

d.

REFERENCE:

T. S. 3.8.1 bases  
New  
Fundamental  
2.2.25 062000 ..(KA's)

ANSWER: 089 (1.00)

b.

REFERENCE:

ILT LP I1-AP-XL-01  
New  
Higher  
064000A2.20 ..(KA's)

ANSWER: 090 (1.00)

b.

REFERENCE:

ILT LP I1-CS-XL-01 1BwEP-1  
Bank  
Higher  
026000A2.08 ..(KA's)



ANSWER: 091 (1.00)

a.

REFERENCE:

1BwOSR 3.3.3.1 TS 3.3.3 and bases TRM  
3.3.h & 3.3.i

New

Higher

2.1.33 017000 ..(KA's)

ANSWER: 095 (1.00)

a.

REFERENCE:

AD-AA-101 HU-AA-104-101

New

Fundamental

2.2.6 194001 ..(KA's)

ANSWER: 092 (1.00)

d.

REFERENCE:

1BwGP 100-6

Bank

Fundamental

034000K1.05 ..(KA's)

ANSWER: 096 (1.00)

d.

REFERENCE:

WC-AA-104 station production risk matrix

New

Higher

2.2.17 194001 ..(KA's)

ANSWER: 093 (1.00)

d.

REFERENCE:

1BwOA SEC-2 ILT LP I1-OA-XL-37

New

Fundamental

056000A2.05 ..(KA's)

ANSWER: 097 (1.00)

a.

REFERENCE:

ILT LP I1-GW-XL-01 BwOP GW-500T1

0BwOS RETS 2.2-1a

New

Fundamental

2.3.8 194001 ..(KA's)

ANSWER: 094 (1.00)

a.

REFERENCE:

0BwOA ELEC-1 ILT LP I1-OA-XL-01A

New

Higher

2.1.25 194001 ..(KA's)

ANSWER: 098 (1.00)

b.

REFERENCE:

ILT LP I1-ZP-XL-01 EP-AA-112 EP-AA-113

RP-AA-203

New

Fundamental

2.3.10 194001 ..(KA's)

ANSWER: 099 (1.00)

d.

REFERENCE:

1BwOA PRI-10

New

Higher

2.4.9      194001      ..(KA's)

ANSWER: 100 (1.00)

d.

REFERENCE:

EP-AA-111 EP-AA-111-F-02 EP-AA-1001

Bank

Higher   2.4.44      194001      ..(KA's)

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

ANSWER KEY  
MULTIPLE CHOICE

001 b	021 a	041 a	061 c	081 a
002 a	022 b	042 c	062 b	082 c
003 a	023 d	043 c	063 a	083 b
004 b	024 d	044 b	064 d	084 d
005 a	025 c	045 a	065 a	085 a
006 a	026 c	046 c	066 c	086 b
007 c	027 a	047 c	067 a	087 a
008 d	028 c	048 d	068 b	088 d
009 b	029 c	049 c	069 b	089 b
010 b	030 b	050 b	070 b	090 b
011 b	031 c	051 c	071 b	091 a
012 a	032 d	052 d	072 d	092 d
013 b	033 a	053 b	073 b	093 d
014 c	034 a	054 b	074 a	094 a
015 c	035 c	055 c	075 c	095 a
016 d	036 a	056 d	076 d	096 d
017 a	037 a	057 a	077 d	097 a
018 d	038 b	058 b	078 a	098 b
019 c	039 d	059 c	079 c	099 d
020 d	040 d	060 d	080 d	100 d

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

## LIST OF STUDENT AIDS (HANDOUTS)

1. 1BwOA PRI-8, Essential Service Water Malfunction Unit 1, Rev 102, Page 25
2. 1BwOSR 3.5.5.1, Attachment A, Charging Pump Discharge Header Pressure - RCS Pressure, Revision 6, Page 14
3. Schematic Diagram, Charging Pump Mini-Flow Isolation Valves, 1CV8110 & 1CV8111, 20E-1-4030CV16
4. BwZP 200-3, Station Release Rate Determination, Revision 0, Pages 1-2
5. BwZP 200-3A1, Release Rate Worksheet, Revision 0, Pages 1-2
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