UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

ENCLOSURE 1

EXAMINATION REPORT - 50-335/OL-89-01

Facility Licensee: Florida Power and Light Company
P. O. Box 14000
Juno Beach, FL 33408-0420

Facility Docket Nos. 50-335 and 50-389

Facility License Nos.: DPR-67 and NPF-16

Examinations were administered at the St. Lucie Nuclear Plant near Ft. Pierce, Florida.

Approved By: Charles A. Casto 11/8/89
Charles A. Casto, Chief Date Signed
Operator Licensing Section 2
Division of Reactor Safety

Summary:

Examinations were administered on August 21-23, 1989.

Written examinations and operating tests were administered to five SRO and one RO applicants. Four SROs and one RO passed these examinations. One SRO applicant failed.

REPORT DETAILS

1. Examiners:

*C. A. Casto, NRC
J. Moorman, NRC
J. Hanek, EG&G
M. Scott, Resident Inspector
S. Elrod, Senior Resident Inspector

*Chief Examiner

2. Facility Personnel at Exit Meeting

J. Martin, Training - Simulator Engineer
B. Parks, QA Supervisor
M. Shepherd, Operations Training Supervisor
C. Burton, Operations Supervisor
J. Holt, Operations Training
J. West, Operations
L. Rich, Operations Training
J. Barrow, Operations Superintendent
T. Peebles, NRC Operations Branch Chief
G. Boissy, Plant Manager
D. Sager, Site Vice President
P. Fincher, Training Superintendent
J. Spodick, Training Department
P. McCullough, Corporate Training Manager

3. Actions on Previous Inspection Findings

Several Examination and Inspection Reports highlighted NRC concerns with the licensee's operator training and plant procedures. The licensee presented their resolutions to these concerns during a meeting with the NRC on January 11, 1989. During this examination visit the examiners reviewed the implementation of numerous resolutions to the concerns. In summary, the licensee has completed many of their corrective actions as documented in this Report. The NRC will continue to monitor the progress of the licensee's corrective actions during future examinations and inspection visits.

(Closed) Examination Report No. 50-335/OL-88-01 IFI 50-335/OL-81-01 and IFI 50-389/OL-81-01, Procedure to Accomplish Channel Checks.

References a commitment by the licensee to establish a permanent plant procedure to ensure qualitative channel checks are performed to verify the Technical Specifications (TS) requirement for "Channel Checks." The examiner reviewed Administrative Procedure No. 1-001-0125. This procedure

gives guidance to the operators for performing Channel Checks and subsequently determining channel operability. This guidance emphasizes a qualitative assessment of the channels' operability. No absolute tolerances are given in the procedure, e.g., percent of scale accuracy; however, the procedure does address diversity in using indications for completing the Channel Checks. This item is closed.

(Closed) Examination Report 50-335/OL-88-01 IFI 50-335/OL-81-02 and IFI 50-389/OL-81-02, AFAS Procedure Changes For SGTR.

Concerns a false "faulted" steam generator signal to the Auxiliary Feedwater Actuation System (AFAS) which inappropriately isolates feed to the intact steam generator during a Steam Generator Tube Rupture (SGTR) event. The licensee had committed to procedure changes and training for operators in mitigation of this false signal. The examiner reviewed Student Study Guides and attendance sheets which covered this evolution. Specifically, Simulator Exercise Guide 0814023, Rev 0, SGTR Post-trip, was reviewed. This Guide ensures the operators manually initiate AFAS prior to reaching a 150 psi differential pressure across the feed header. Additionally, EOP 04 (FINAL DRAFT) SGTR, cautions the operators that an inappropriate steam generator isolation may occur due to AFAS, and that manual initiation of AFAS might be required. The draft EOP User Guide also gives clarification to the operator on this condition. This item is closed.

(Closed) Examination Report 50-335/88-01 IFI 50-335/OL-81-3 and IFI 50-389/OL-81-03, Containment Evacuation Alarms Sounding in the Control Room.

References a commitment by the licensee to investigate the possible distraction of the operators during a Loss of Coolant Event by the Containment Evacuation Alarm. The licensee has confirmed the finding that the alarm will sound in the control room during the event. No silencing feature is available to allow the operator to inhibit this alarm. The continuous sounding of the alarm could distract from the performance of the EOPs during this event. The examiner reviewed a Request for Engineering Support (REA) 89-007 which authorizes a permanent plant change to install an "Acknowledge" pushbutton to silence the containment evacuation alarm in the control room. Future inspections and examinations will monitor the progress of the REA. This item is closed.

(Closed) Examination Report 50-335/88-02 IFI 50-335/OL-82-01 and IFI 50-389/OL-82-01 Guidance for Loss of Offsite Power in EOPs.

The operators did not have a well defined EOP path to follow in response to a Loss of Offsite Power event. There was a procedure available to the operators (Abnormal Operating Procedure) to follow; however, this procedure did not integrate a mitigation strategy with the EOPs. As evidenced by past examination scenarios, the operators were confronted with contradictory information during a Loss of Offsite Power event. The licensee has developed an EOP (EOP-9 Loss of Offsite Power) which now gives clear procedural direction to follow for this event. The examiner reviewed the procedure to ensure entry conditions were clear to the operators. This item is closed.

(Closed) Examination Report 50-335/88-02 IFI 50-335/OL-82-02 and IFI 50-389/OL-82-02 Lack of Emphasis on EOP-8 (now EOP-15) Training.

The IFI concerned the lack of sufficient operator training on EOP-8 (now EOP-15) Functional Recovery. The licensee has generated several Simulator Exercise Guides (10815016, 0702828) and Lesson Plans (0814021, 0814020, 0815013 and 0814010) which require the operator to perform in EOP-8(15) during training. The operators have attended simulator training sessions on various events which require the use of EOP-8(15) to mitigate. The licensee has made significant changes to this, and other EOPs. The Training Department has been intimately involved in the procedural upgrade and has enhanced the training of licensed operators by the implementation of these Simulator Exercise Guides. This item is closed.

Examination Report 50-335/88-01 noted that the Shift Technical Advisors' (STA) role was not clearly defined during emergency events; Examination Report 50-335/88-02 notes that the licensee was developing role delineation and integrating the STAs into the operating crews. During this examination visit the examiners reviewed the Administrative Procedure which addresses the Duties and Responsibilities of the STA and also noted that guidance has been given to the Training Department personnel in developing Exercise Guides which ensure STA activities are described. While reviewing the requalification program scenarios, the examiner also noted that there is evaluation criteria for the STA in the requalification Guides. The licensee evaluates STA performance during requalification training; however, not all crews train with an STA and the licensee remains hesitant to use the STAs during NRC requalification/initial examinations.

Examination Report 50-335/88-02, Enclosure 3, Training Assessment, detailed a concern that the Training Department has exhibited a lack of aggressive involvement in plant operations, i.e., has failed to address both plant and procedural deficiencies. During this examination visit the examiners recognized that management has counseled the instructors to be more diligent in identifying and resolving deficiencies. During preparation for, and administration of, the initial examinations on this visit the examiners noted improvement in this area. The instructors displayed concern for accuracy of plant procedures, especially the Draft EOPs.

Several examination visits have identified a generic weakness of licensed operator candidates with regard to a loss of Vital 4KV Emergency Bus. Their weaknesses were exacerbated by the lack of procedural guidance with regard to this event. The licensee has generated an Off-Normal procedure (2-0910054) which provides guidance to the operators for this event. Additionally, simulator training on the event has been developed and administered for requalification training.

4. Exit Meeting

At the conclusion of the site visit the examiners met with representatives of the plant staff to discuss the results of the examinations. The examiners made the following observations concerning your training program.

As discussed with the facility staff, Crew 1 exhibited weaknesses in communication and supervisory abilities by the SRO. The crew had difficulty with the Auxiliary Feedwater Actuation System and knowledge of subcooling.

The facility staff pre-reviewed the written examination. Several changes were made to the examination as a result of this review. None of the modifications resulted in an intent change for any of the questions. There were no substantial post-examination comments by the facility.

During validation and performance of the simulator scenarios, a problem was noted by the examiners concerning (DRAFT) EOP-3, Loss of Coolant Accident. The Safety Function Status Checks (SFSC) for Core Heat Removal referenced superheat conditions, as measured by Core Exit Thermocouples (CET), for transition to FR-15 Functional Recovery. During validation the examiners noted that on a Small Break Loss of Coolant accident the CETs indicated superheat conditions under most break sizes. The facility personnel attempted to use an average of CET indications which would result in subcooling being indicated for the Core Heat Removal SFSC. This averaging method was not delineated in the procedure. Additionally, the transition to FR-15 Functional Recovery under this condition is not as prudent as remaining in EOP-3 Loss of Coolant. The licensee was aware of this difficulty and proposed a procedure change to the Draft EOP-3 which would eliminate this confusion. The propsed change was validated and again resulted in transition to FR-15 Functional Recovery. The licensee is continuing to resolve this descrepancy. The NRC will monitor this on future inspection/examination visits.

ENCLOSURE 3

SIMULATION FACILITY REPORT

Facility Licensee: Florida Power and Light Company

Facility Docket Nos.: 50-335 and 50-389

Operating Test Administered on: August 22-23, 1989

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the simulator portion of the operating test, the following items were observed:

During validation, the licensee took aggressive action to resolve any discrepancy which adversely effected the examination validity. All other noted items were previously identified and documented by the licensee.

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION
REGION 2

FACILITY: St Lucie 1 & 2

REACTOR TYPE: PWR-CE

DATE ADMINSTERED: 89/08/22

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked up six (6) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
24.00	24.00	_____	_____	4.	REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (10%) (FUNDAMENTALS EXAM)
33.00	33.00	_____	_____	5.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (33%)
43.00	43.00	_____	_____	6.	PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (13%)
100.00		_____ FINAL GRADE	_____%		TOTALS

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

_____
Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. After the examination has been completed, you must 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. This must be done after you complete the examination.

3. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

4. Use black ink or dark pencil only to facilitate legible reproductions.

5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet.

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of each section of your answer sheets whether you use the examination question pages or separate sheets of paper. Initial each page.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer as to category and number (i.e. 1.04, 6.10) and skip at least 3 lines between answers to allow space for grading.

12. Write "End of Category " at the end of your answers to a category.

13. Start each category on a new page.

14. Write "Last Page" on the last answer sheet.

15. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

16. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

17. Show all calculations, methods, or assumptions used to obtain an answer.

18. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: partial credit will NOT be given on multiple choice questions.

19. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

20. If the intent of a question is unclear, ask questions of the examiner only.

21. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

22. To pass the examination, you must achieve an overall grade of 80% or greater and at least 70% in each category.

23. There is a time limit of (6) hours for completion of the examination. (or some other time if less that the full examination is taken.)

24. When you are done and have turned in your examination, leave the examination area as defined by the examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION 4.01 (1.00)

Which ONE of the following correctly describes the effect of an actual stuck out CEA on determining Mode 3 shutdown margin?

a. No effect, since shutdown margin assumes a stuck out rod worth.

b. The worth of the inoperable control rod is added to the hypothetical stuck out rod worth.

c. No effect, since the worth of the inoperable control rod is compensated for by boration.

d. The worth of the inoperable control rod is used to totally replace the hypothetical assumed stuck out rod worth.

QUESTION 4.02 (1.00)

Which one of the following is the purpose of using soluble boron to control the excess reactivity of the reactor?

a. It does not significantly affect the flux shape.

b. It does not significantly affect the rod worth.

c. It is more cost effective than adding more rods.

d. It increases reactor loading rates.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.03 (1.00)

Which one of the following statements concerning differential boron worth (DBW) is correct?

a. DBW will decrease over core life for the same power level, due to decreasing control rod worth.

b. DBW is less at low temperature for same EFPH.

c. DBW will increase over core life due to the buildup of fission products.

d. DBW will increase over core life for the same power level, due to decreasing boron concentration.

QUESTION 4.04 (1.00)

Which one of the following is NOT one of the three (3) reasons for the CEA Insertion limit (PDIL)?

a. Maintain acceptable power distribution limits (peaking factors).

b. Ensure that the amount of availiable reactivity for shutdown is maintained.

c. To maintain a linear Rod Worth profile dependent on power.

d. To ensure that CEA ejection effects are limited to acceptable levels.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.05 (1.00)

From the choices below, select the one that correctly completes the following:

During a Xenon-free reactor startup, critical data was inadvertently taken two decades early (5x10-6). Assume RCS temperature and boron concentration remain the same and critical data is taken at the the proper power level (5x10-4).
Critical Rod position at 5x10-4 _____ Critical Rod position at 5X10-6

a. Is Less Than

b. Is the Same As

c. Is Greater Than

d. Cannot be Compared To

QUESTION 4.06 (2.00)

a. Explain HOW (more positive or more negative) and WHY Axial Shape Index (ASI) is expected to change as power is increased from 20% to 70% during a normal power increase at BOL. (1.0)

b. Explain what TWO diverse methods are taken to maintain ASI within limits and WHY these actions are effective. (1.0)

QUESTION 4.07 (1.00)

Which one of the following is NOT an operational consideration in eliminating or minimizing water hammers?

a. Slow closing of valves.

b. Starting pumps with discharge valves open on a pressurized header.

c. Slow opening of valves.

d. Removing moisture from steam lines.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.08 (1.00)

Which one of the following correctly explains why the primary flowrate is approximately ten times the secondary system flowrate?

a. Primary delta-T is a direct function of the power-to flow ratio.

b. Cp decreases as Tave decreases.

c. Secondary sytem head losses are greater than the primary.

d. Enthalpy rise of the secondary is greater due to the phase change.

QUESTION 4.09 (1.00)

Which one of the following conditions is required for brittle fracture of a reactor pressure vessel to occur?

a. Neutron embrittlement of the vessel wall, temperature below Nil Ductility Temperature [NDT], tensile stress applied to the vessel wall.

b. Material defect in the vessel wall, temperature below Nil Ductility Temperature [NDT], tensile stress applied to the vessel wall.

c. Neutron embrittlement of the vessel wall, temperature below Nil Ductility Temperature [NDT], material defect in the vessel wall.

d. Material defect in the vessel wall, neutron embrittlement of the vessel wall, tensile stress applied to the vessel wall.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.10 (1.00)

Voiding has occurred in the RCS, in the vicinity of the reactor vessel during a natural circulation cooldown. Which one of the following correctly characterizes the process of collapsing the void?

a. The void will superheat if an attempt is made to collapse it too fast, the rate of collapse will be governed largely by ambient heat loss from the void.

b. The void will collapse at a rate equivalent to the rate of HPSI flow, therefore, full HPSI should be run until the void is fully collapsed.

c. The void will be composed largely of hydrogen gas, and will therefore require degasifying of the RCS in order to begin collapsing it.

d. The void will collapse immediately upon increasing the pressure above the local saturation pressure; the main concern is water hammer.

QUESTION 4.11 (1.00)

Which ONE of the following statements is correct concerning a Primary System Manual calorimetric?

a. If feedwater temperature is read erroneously high, then the calculated reactor power will be higher than actual caused from the considerable additional heat energy provided.

b. The calorimetric equation does not take into consideration the heat added by the reactor coolant pumps, or the heat lost to the containment atmosphere (ambient losses).

c. If a channel of Main Steam Pressure is read erroneously low, then the calculated reactor power will be lower than actual, caused from the lower calculated enthalpy.

d. The results of the primary calorimetric may be used as the basis for calibration of the power range nuclear instrumentation.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.12 (1.00)

Which evolution is most limiting when considering RX vessel stresses.

a. Heatup operation.

b. Cooldown operation.

c. Steady State operation.

d. Refueling operations.

QUESTION 4.13 (1.00)

Fill in the blanks concerning reactor vessel integrity.

The TWO primary parameters which can be controlled to minimize reactor vessel stress during normal operations are ___(1)___ and ___(2)___.

QUESTION 4.14 (1.00)

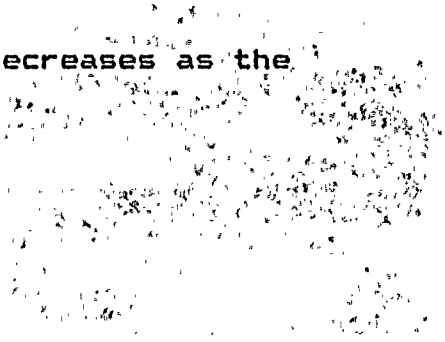
Which statement BEST describes what happens to a fluid as it passes through a venturi?

a. Pressure remains constant, and the velocity increases as the diameter of the venturi decreases.

b. Pressure increases and velocity decreases as the diameter of the venturi decreases.

c. Pressure increases and velocity remains constant as the diameter of the venturi increases.

d. Pressure increases, and the velocity decreases as the diameter of the venturi increases.



(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.15 (1.00)

Assume one Reactor Coolant Pump trips at 30% power without a reactor protective system actuation. Indicate which one of the following parameters will DECREASE.

a. Flow in the reactor coolant loops with the RCPs still running.

b. Reactor vessel delta P.

c. Core delta T.

d. The steam flow in the steam generator on the other side.

QUESTION 4.16 (1.00)

Which one of the following completes the definition of "Pump Runout"?

A pump that is pumping at...

a. minimum head and maximum flow.

b. maximum head and minimum flow.

c. maximum discharge pressure and zero flow.

d. minimum discharge pressure and minimum flow.

QUESTION 4.17 (1.00)

For throttling, globe valves are preferred over gate valves because:

a. the loss coefficient for a full open globe valve is smaller than the loss coefficient for a full open gate valve.

b. the flow characteristics are generally more linear for globe valves than for gate valves.

c. valve position for a mid positioned valve is more reliable for globe valves than for gate valves.

d. valve motor operators are more adaptable to globe valves than to gate valves.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.18 (1.00)

Which one of the following statements about temperature measurement is NOT correct?

a. If the sensing wire of an RTD breaks, the instrument will read offscale high.

b. If a thermocouple wire breaks, the instrument will read off scale low.

c. The temperature range which can be measured by an RTD is smaller than that for a thermocouple.

d. RTDs respond faster to temperature changes than thermocouples.

QUESTION 4.19 (1.00)

Closing a circuit breaker between two electrical generating systems that are out of phase will result in:

a. negating the reverse power protection on the lagging frequency system.

b. a rapid phase realignment which could damage generators and loads connected to the system.

c. a voltage reduction in both generating systems.

d. a reduction of the frequency of the combined generating system.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.20 (1.00)

Which one of the following most accurately represents Diesel Generator control?

a. The governor controls the air flow to the engine thereby controlling engine speed.

b. The UNIT mode of governor control allows the diesel generator to operate in the isochronus mode.

c. The DROOP mode of governor control allows the diesel generator to operate in the isochronus mode.

d. The electric governor is the backup to the mechanical governor and is set at a slightly higher speed.

QUESTION 4.21 (1.00)

Which one of the following effects will occur as a result of increased fouling of the main condenser tube bundles? [Assume cooling water flow and steam flow rates remain constant]

a. Cooling water outlet temperature will decrease.

b. Condenser hotwell temperature will decrease.

c. Condensate depression will increase.

d. Condenser Heat rejection will increase.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

QUESTION 4.22 (1.00)

Which ONE of the following is CORRECT concerning RCP operations to prevent motor damage from overheating?

a. An RCP should be allowed to reach rated speed before it is tripped except in an emergency.

b. An RCP motor should either be run for 40 min. or stopped for 20 min. to obtain sufficient cooling prior to restarting.

c. An RCP motor may be subjected to THREE consecutive starts if the motor is at a higher than ambient temperature condition.

d. An RCP motor may be subjected to FOUR consecutive starts if the motor is at ambient conditions.

QUESTION 4.23 (1.00)

Which one of the following statements concerning heat exchanger operation is NOT correct?

a. Once the normal operating condition for a heat exchanger has been established UA becomes approximately a fixed value throughout the life of the heat exchanger.

b. If the Delta T across a heat exchanger is not constant then the Log Mean Temperature Difference (LMTD) is used to accurately calculate the heat transfer rate.

c. The heat removal rate for a heat exchanger will increase if either of the fluid flow rates through the heat exchanger is increased.

d. Hotter fluid gives up energy to colder fluid via conduction and convection.

(***** END OF CATEGORY 4 *****)

QUESTION 5.01 (1.00)

Which one of the following describes the method for a dropped CEA recovery while maintaining desired reactor power level as detailed in St. Lucie Unit 1 Off-Normal Operating Procedure 1-0110030,"CEA Off-Normal Operation and Realignment" ?

a. The affected CEA is withdrawn to the group level by selecting the MANUAL INDIVIDUAL mode and the affected INDIVIDUAL CEA SELECTION pushbutton and then positioning the joystick to WITHDRAW.

b. The affected group is inserted to the full-inserted position by selecting the MANUAL GROUP mode and the affected GROUP SELECTION pushbutton and then the whole group is withdrawn by positioning the joystick to WITHDRAW.

c. While maintaining RX power constant by boration, the CEA should be recovered by slow smooth withdrawal using small increments of movement. The period of time for recovering the CEA should be at least 10 minutes.

d. The affected group is inserted by selecting the MANUAL GROUP mode and the affected GROUP SELECTION pushbutton; and this movement is alternated with insertion of non-affected groups by selecting AUTO SEQUENTIAL mode and ensuring the non-affected groups move as required.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.02 (1.00)

St. Lucie Unit 1 has been operating normally for a long period at 100% power. A transient occurs that has the following effects:

Reactor power decreased slightly,
RCS Tave decreased slightly,
Digital Data Processing System shows flux lower for a single detector location.

Which one of the following events caused the transient with the above indications ?

a. An inadvertent boration.

b. A dropped CEA.

c. A tripped RCP.

d. A trip of both heater drain pumps.

QUESTION 5.03 (1.00)

A known LOCA has occurred on Unit 1 and entry into 1-EOP-03, "LOSS OF COOLANT ACCIDENT" has been accomplished. Natural circulation flow has NOT been established nor verified. Given that RCS pressure reads 1350 psi and the average Core Exit Thermocouple (CET) temperature is 588 degrees F, which one of the actions below is the directed response for this plant condition ?

a. SI termination criteria is met, so the operating HPSI pumps may stopped or throttled one at a time as directed in 1-EOP-03, "LOSS OF COOLANT ACCIDENT".

b. Core Heat Removal is to be implemented by Once-Through-Cooling as directed in transition to 1-EOP-15, "FUNCTIONAL RECOVERY".

c. Restart of an RCP to establish a forced cooling path for Core Heat Removal is directed in 1-EOP-03, "LOSS OF COOLANT ACCIDENT".

d. RCS Inventory Control is to be implemented by Safety Injection and Charging Pumps as directed in transition to 1-EOP-15, "FUNCTIONAL RECOVERY".

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.04 (1.00)

Which of the following statements correctly describes the reason that simultaneous hot/cold leg injection is established 4 to 6 hours after a LOCA event initiates ?

a. This allows for better RCS inventory control by rapidly delivering the Refueling Water Tank volume to the RCS.

b. This ensures adequate water volume in the containment sump by the time the Recirculation Actuation Signal (RAS) occurs.

c. This ensures that the safety injection flow to the hot legs is entrained in the steam flow which provides improved cooling.

d. This allows for the flushing of boric acid from the core which prevents core flow blockage.

QUESTION 5.05 (1.00)

Procedure 2-EOP-03, "Loss of Coolant Accident (LOCA)", has the operator trip all four RCP's after SIAS is verified (at Step 6 when pressurizer pressure is less than 1736 psia). Which one of the following completes the statement describing the reason or basis for tripping the RCP's? Stopping the pumps ...

a. decreases the amount of water mass inventory lost through the break, enhancing efforts to keep the core covered.

b. increases the flow of steam (instead of two-phase mixture) from the break, enhancing heat removal from the core.

c. decreases the cold leg pressure head, enhancing Safety Injection System performance at higher flow rates.

d. increases flow stability of the RCS by allowing natural circulation , enhancing slow, controlled heat removal.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.06 (1.00)

Select the combination below that CORRECTLY completes the following statement:

In order to prevent damage to an RCP or its seals, extended operation of an RCP is NOT allowed with a loss of CCW to the pump. If CCW flow cannot be restored to the RCP within __ minutes, an AUTOMATIC reactor trip will be generated on _____ ; and after the trip, the operator will stop the affected RCP.

a. 5, Unit 1

b. 5, Unit 2

c. 10, Unit 1

d. 10, Unit 2

QUESTION 5.07 (1.00)

Which one of the following conditions is a direct symptom of a situation that requires emergency boration, as described in Off-Normal Operating Procedure No. 1-0250030, EMERGENCY BORATION?

a. RCS subcooled margin slowly lowering at full-power operation.

b. A shutdown CEA drops fully inserted on reactor startup.

c. RCS Tavg decreases abnormally after a normal reactor trip.

d. A regulating CEA is above its PDIL at 25% power operation.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.08 (1.00)

Which one of the following is an indication that Natural Circulation is being established?

a. Thot is stable and Tcold is decreasing steadily.

b. Thot and Tcold are increasing steadily at the same rate.

c. Thot is increasing steadily and Tcold is decreasing steadily.

d. Thot is stable and Tcold is increasing steadily.

QUESTION 5.09 (1.00)

Which one of the following statements is NOT an Instruction or Contingency Action as delineated in St. Lucie Unit 1 Procedure 1-EOP-10, Draft 3, "STATION BLACKOUT" ?

a. Verify the Safety Function Status Check acceptance criteria are met, and perform check every 15 minutes thereafter.

b. Ensure at least one steam generator is being restored to greater than 40% at the maximum feed rate.

c. Implement the Emergency Plan per EPIP 3100021E, "Duties and Responsibilities of the Emergency Coordinator."

d. Verify performed or perform the "Standard Post Trip Actions" per 1-EOP-01.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.10 (1.00)

Which one of the following conditions requires entry into the ACTION STATEMENT for Onsite Power Distribution per the attached sections of St. Lucie Unit 2 Technical Specifications ? (Assume NORMAL equipment alignment unless otherwise stated)

a. Unit 2 at 100% power; 120 VAC Instrument Buses 2MB, 2MD, 2MB-1, and 2MD-1 are aligned for 10 hours to MCC 2B5 through their bypass transformers, with inverters 2B and 2D de-energized, while 125 VDC battery 2B is on equalize charge.

b. Unit 2 in Mode 5; 125 VDC bus 2A is de-energized and 120 VAC Instrument Buses 2MA, 2MC, 2MA-1, and 2MC-1 are aligned for 36 hours to MCC 2A5 through their bypass transformers.

c. Unit 2 at 3% power; 120 VAC Instrument Buses 2MC and 2MC-1 are aligned for 3 hours to MCC 2A5 through its bypass transformer, with inverter 2C de-energized, while the 125 VDC feeder breaker to the inverter is being replaced.

d. Unit 2 in Mode 6; 120 VAC Instrument Buses 2MB and 2MB-1 are aligned for 15 hours to MCC 2B5 through its bypass transformer, and inverter 2A is de-energized for 4 hours while maintenance is performed on the 125 VDC bus 2A under-voltage sensor.

QUESTION 5.11 (1.00)

Which one of the following is NOT a method used to accomplish the Reactivity Control Safety Function?

a. Insertion of CEA's.

b. Emergency Boration.

c. Shutdown margin calculation.

d. Open the Reactor Trip Breakers locally.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.12 (1.00)

Which one of the following control-room indications available to the operator is a possible indication of a void in the reactor-vessel head, during a natural circulation cooldown at Unit 1?

a. QSPDS Reactor-vessel level monitoring display indicates >100% in the Reactor head region.

b. Significant unexpected pressurizer level decrease while operating auxiliary spray.

c. PZR level decrease while charging to RCS loops.

d. If pressurizer level system is in auto, unanticipated letdown flow less than charging flow.

QUESTION 5.13 (1.00)

During a total loss of feedwater condition as described in EOP-06, "Total Loss of Feedwater Procedure", when restoring steam generator level there is a caution to add feedwater slowly to avoid four potential concerns. Which one of the following is NOT a potential concern?

a. Excessive PZR level and temperature transient.

b. Water hammer in feed sparger.

c. Excessive cooldown rate.

d. Erroneous steam generator level indication.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.14 (1.00)

Which one of the following is the Technical Specification Bases for being in Hot Standby with Tavg less than 500 degrees-F, after exceeding the limits on specific activity of the primary coolant?

a. To allow sufficient decay time while shutdown for the decay of the iodine spiking phenomenon.

b. To prevent exceeding site boundary dose limits following a SGTR accident in conjunction with an assumed primary to secondary leakage rate and loss of electrical power.

c. To prevent exceeding dose limits to personnel during normal plant operations within TS allowable reactor coolant system leakage limits.

d. To allow for the flow capacity and temperature limits of the resin used for reactor coolant system cleanup and purification.

QUESTION 5.15 (1.00)

What is the purpose of the following precaution as listed in Shutdown Cooling Off-Normal, ONOP 1-0440030?

"If possible two LPSI Pumps should be considered for use while in a mid-loop condition with 3000 gpm flow".

a. So that if one pump fails there is still flow to the RCS.

b. So the effects of vortexing are minimized.

c. So the LPSI pump run time is better equalized.

d. So more heat removal capacity is available to the RCS.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.16 (1.00)

Which one of the following is the approximate time to reach boiling conditions after shutdown cooling is lost one week after shutdown, with the RCS at mid-loop and an initial temperature of 140 degrees-F, and at atmospheric pressure?

a. 1 minute

b. 15 minutes

c. 1 hour

d. 1.5 hours

QUESTION 5.17 (1.00)

Which ONE of the following is an automatic action associated with an RCP Seal Cooler to CCW leak?

a. High radiation alarm in the CCW system will close the RCP seal cooler discharge valves.

b. High return flowrate from the RCP's alarm will divert the CCW surge tank vent to the chemical drain tank.

c. High return flowrate from the RCP's alarm will close the individual RCP's seal cooler discharge valves.

d. A high delta-T of 203 degrees-F will close the individual RCP's seal cooler discharge valves.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.18 (1.00)

Why is there a possiblity of core damage if the secondary heat sink is not reestablished and maintained after an automatic reactor trip from full power?

a. Because initially the reduction in secondary load occurs more rapidly than the primary, and reactor power exceeds steam demand.

b. Due to the steam generator level control response from the initial swell on the reactor trip the S/G's will not be fed in automatic with decay heat still to be removed.

c. Since S/G level shrinks on the reactor trip an overfeeding of the S/G may occur isolating feedwater to the S/G on high level with decay heat still to be removed.

d. Because the S/G feedwater control system closes the main feedwater regulating valves on a reactor trip signal, and decay heat removal will cause the S/G's to dryout.

QUESTION 5.19 (1.00)

Which one of the following alarms is an indication/symptom that a Wide Range Instrumentation channel has malfunctioned and failed HIGH?

a. Reactor nuclear/delta-T power channel deviation.

b. TM/LP channel trip.

c. Reactor high power level channel trip.

d. Reactor power high rate of change trip.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.20 (1.00)

Which ONE of the following correctly states the effect of the loss of a 125 V DC vital bus with the plant AC power supplied by the auxiliary transformers?

a. All emergency diesels will start.

b. The reactor will not trip.

c. The associated AC buses will be lost, due to breaker control power.

d. The associated diesel generator output breaker, if loaded prior to the loss of the DC bus, will automatically trip open.

QUESTION 5.21 (1.00)

Which one of the following statements concerning a loss of instrument air is correct?

a. Pressurizer spray valves fail "as is" until actuated.

b. Feedwater regulating bypass (15%) valves are NOT affected by a loss of instrument air.

c. Letdown isolation valves fail open.

d. Unit 1/2 instrument air cross ties open at decreasing pressure of 80 psig and close if pressure continues to decrease to 70 psig.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.22 (1.00)

Which one of the following is a protective function to prevent a loss of heat sink during a partial loss of feedwater at power? (Assume Unit 1)

a. Reactor trip if S/G level < 39%.

b. Turbine runback due to loss of one heater drain pump with turbine power >92%.

c. Turbine runback due to loss of one main feedwater pump with turbine power < 50%.

d. Reactor trip if RCS pressure > 2300 psia.

QUESTION 5.23 (1.00)

Which one of the following is NOT an immediate operator action for a radioactive gas leak, according to ONOP 1-0530031 "Uncontrolled Release of Radioactive Gas" procedure?

a. NPS determination of the necessity of initiating the emergency plan.

b. Notify personnel to evacuate the affected area(s).

c. Isolate the source of gas leak, if possible.

d. Start both Reactor Auxiliary Building supply and exhaust fans.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.24 (1.00)

Select the combination below that correctly completes the following statement.

"With the concentration of oxygen in the on-service gas decay tank > __(1)__ % by volume and the hydrogen concentration >__(2)__% by volume, immediately suspend all additions of waste gases to the system and immediately commence reduction of oxygen to less than or equal to 2% by volume."

a. 2, 1

b. 3, 2

c. 4, 2

d. 6, 4

QUESTION 5.25 (1.00)

Which one of the following is NOT an automatic action or symptom associated with an accident involving a spent fuel element inside containment, according to ONOP 1-1600030 "Accidents Involving New Or Spent Fuel" procedure?

a. Containment air high radiation alarms.

b. CIAS signal.

c. Reactor cavity cooling fans will trip.

d. Containment evacuation alarm.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.26 (1.00)

Which of the following is correct concerning the Emergency Diesel Generator Design Bases?

a. The diesel generator is capable of rejecting the largest single load while maintaining voltage and frequency at acceptable levels.

b. The maximum predicted loads in an emergency do not exceed 95% of the 30-minute load rating of the diesel generator.

c. The speed of the diesel generator set will not exceed 109% of nominal speed during recovery from transients caused by loss of the largest single load while operating.

d. The engines are capable of starting, accelerating, and supplying the emergency loads in their proper sequence without exceeding a 10% speed drop maximum at any time.

QUESTION 5.27 (0.50)

FILL IN THE BLANK

Following a reactor trip due to a CEA malfunction on St. Lucie Unit 2, the reactor trip breaker position can be verified in the control room by checking for a green light on the _____. (Note: more than one word response may be required.)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.28 (2.00)

The following valves may be utilized during Emergency Boration as described in Off-Normal Operating Procedure No. 1-0250030, EMERGENCY BORATION. For the given valve in Column I, select the appropriate valve type from Column II. Note: responses from Column II may be used more than once or not at all.

COLUMN I (VALVE)	COLUMN II (VALVE TYPE)
a. V-2525 (Boron Load Control Valve)	1. Local manually-operated
b. V-2510 (BAM Pump Recirc. Valve)	2. Remote motor-operated
c. V-2514 (Emergency Borate Valve)	3. Remote solenoid-operated
d. V-2509 (Gravity Feed Borate Valve)	4. Remote air-operated

QUESTION 5.29 (1.50)

Match the automatic actions on abnormal pressurizer pressure in Column A to the associated setpoint in Column B. Note: setpoints may be used more than once or not at all. (Assume Unit 1)

Column A (Action)	Column B (Setpoint, psia)
a. High pressure reactor trip.	1. 2500
	2. 2400
b. Power operated reliefs open.	3. 2340
	4. 2220
c. SIAS initiates.	5. 2200
	6. 2100
d. TM/LP reactor trip minimum setpoint.	7. 1887
	8. 1800
e. Low pressure alarm.	9. 1660
	10. 1600
f. Backup heaters energize.	11. 1500

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

QUESTION 5.30 (1.00)

Fill In The Blanks

During implementation of EOP-4 (SGTR) the RCS is cooled down to < 525 degrees Thot to prevent ___(1)___ . The RCS pressure is lowered to plus or minus 50 psia of the isolated steam generator to minimize ___(2)___ . (Note: More than one word answers required)

QUESTION 5.31 (2.00)

a. St. Lucie Unit 2 Technical Specifications requires all full-length CEAs inserted into the core to be OPERABLE with each CEA of a given group positioned within ____ inches of all other CEAs in its group. (Choose one) (0.5)

1. 7 inches
2. 8 inches
3. 9 inches
4. 10 inches

b. List THREE parameters utilized in the safety analysis which are effected by a small misalignment (less than 15"). (1.5)

(***** END OF CATEGORY 5 *****)

QUESTION 6.01 (1.00)

The reason for the requirement for the RCS temperature to be >500 F prior to starting the 4th RCP is:

a. Prevent RCP cavitation due to insufficient Net Positive Suction Head.

b. Prevent an inadvertent reactivity increase due to cold water entering the core.

c. Prevent an upward shift of the fuel assemblies.

d. Prevent an inadvertent pressure transient that may exceed RCS Technical Specification limits.

QUESTION 6.02 (1.00)

Which one of the following is TRUE concerning the Center Amber Lamp associated with the RCP start controls?

a. Indicates that the RCP breaker is in the "Racked In" Position.

b. Indicates that 6.9 KV power is available at the RCP breaker.

c. Indicates that 125 vdc power is available to the RCP start circuit.

d. Indicates that sufficient CCW flow and oil lift pressure are available to the pump.

QUESTION 6.03 (1.00)

Which of the following will generate a CEA Motion Inhibit?

a. Upper Group Stop

b. Lower Electrical Limit

c. Power Dependent Insertion Limit (PDIL)

d. "Sequential Permissive

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.04 (1.00)

Which one of the following on Unit 1 is NOT an action caused by a Main Steam Isolation Signal (MSIS).

a. Close the Main Steam Isolation Valves.

b. Close the Main Feed Isolation Valves.

c. Close the Main Feed Regulating Valves.

d. Close the Main Feed Pump Discharge Valves.

QUESTION 6.05 (1.00)

The Engineered Safety Feature Actuation System Signal whose actuation relays are ENERGIZED to actuate is the:

a. Safety Injection Actuation Signal (SIAS).

b. Containment Spray Actuation Signal (CSAS).

c. Main Steam Isolation Signal (MSIS).

d. Containment Isolation Actuation Signal (CIAS).

QUESTION 6.06 (1.00)

Which one of the following best describes the primary flowpath for hot leg injection on Unit 1?

a. Containment spray pump discharge to 'A' HPSI discharge to LPSI hot leg suction line to hot leg.

b. HPSI pump takes suction on containment sump and discharges to hot leg via auxiliary spray.

c. Charging pump takes suction on RWT and discharges via auxiliary spray.

d. 'B' LPSI pump discharges through "A" train warmup valve to 'A' LPSI hot leg suction valves.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.07 (1.00)

Which one of the following statements is correct concerning the Steam Bypass Control System?

a. With all controllers in manual, the quick open signal is disabled.

b. The system will generate a full open modulation signal if the steam pressure transmitter in the actuations channel fails high.

c. The sequence for valve opening with a full modulation signal present is:

1. 5% valve opens fully
2. first 10% valve opens fully
3. second 10% valve opens fully
4. third and fourth 10% valve opens fully

d. With the permissive switch in off, a quick open signal will still operate the valves.

QUESTION 6.08 (1.00)

Which one of the following is CORRECT concerning the Excore Nuclear Instrument Channels?

a. At $\geq$ 10 E -4% power, the Unit 1 and Unit 2 wide range NI's enable the SUR trip.

b. The Zero Power Mode Bypass blocks Delta T power, bypasses low flow and S/G pressure trips at < .5% on Unit 2.

c. Both Units use the wide range fission chambers to monitor counts during refueling operations.

d. Zero Power Mode Bypass comes from the wide range on Unit 2 and the linear range on Unit 1.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.09 (1.00)

Which one of the following is a CORRECT statement concerning the Component Cooling Water (CCW) system differences between Units 1 and 2?

a. A low level in the CCW system surge tank will isolate the non-essential header at Unit 1, while this is not the case for Unit 2.

b. The fuel pool heat exchanger is supplied from A or B header at Unit 2 and for Unit 1 it is supplied by the non-essential header.

c. The A and B headers at Unit 1 supply CCW to the control room air conditioners and for Unit 2 the conditioners are air cooled.

d. The instrument air compressor (inside containment) at Unit 1 is supplied with CCW from the non-essential header, for Unit 2 it is supplied CCW from the essential header.

QUESTION 6.10 (1.00)

Which one of the following is CORRECT concerning the Unit 1 and Unit 2 RCS cold leg temperature measurements?

a. Unit 1 control channel will signal an automatic withdrawal prohibit (AWP) on high temperature and Unit 2 control channel will not generate an AWP.

b. Both Unit 1 and Unit 2 control channels supply inputs to the Reactor Regulating System for the low power auto rod motion inhibit circuit.

c. Unit 1 and Unit 2 control channels are an input to the Control Element Drive System, used to generate a CWP signal.

d. Unit 1 control channels supply input to the OMS, Unit 2 control channels supply input to LTOPS.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.11 (1.00)

Which one of the following reactor trips DOES NOT receive an input from the core protection calculators?

a. Thermal margin/low pressure

b. Local power density

c. High rate of change of power

d. Variable high power

QUESTION 6.12 (1.00)

Which one of the following statements concerning the LPSI/shutdown cooling system is correct? (Assume Unit 1)

a. The hot leg suction valves to the LPSI pumps automatically close at a decreasing RCS pressure of 500 psig.

b. The LPSI pumps can be used in fill and makeup to the SITs with RCS pressure less than 1500 psig.

c. When using the system for shutdown cooling, purification of the RCS coolant using the CVCS demineralizers is not available.

d. The LPSI pumps start automatically on SIAS and are stopped automatically when RCS temperature reaches 325 degrees.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.13 (1.00)

Choose the correct statement.

The 125 VDC systems are normally lined up such that:

a. the C train is powered from either of the A or B buses via the swing bus AB in unit 2.

b. the swing bus AB is powered from the A side train in unit 1.

c. the battery charger AB is connected to the A side train in unit 2.

d. the swing bus AB is powered from the A side train in unit 2.

QUESTION 6.14 (1.00)

Which one of the following statements is CORRECT concerning the Motor Operated Recirculation Valves on the charging pumps?

a. When the charging pumps receive a START signal from the Control Room, the corresponding recirc valves receive a signal to modulate OPEN.

b. When the charging pumps receive a STOP signal from the Control Room, the corresponding recirc valves receive a signal to modulate CLOSED.

c. When the charging pumps receive a START signal from the Pressurizer Level Control System, the corresponding recirc valves receive a signal to modulate OPEN.

d. When the charging pumps receive a STOP signal from the Pressurizer Level Control System, the corresponding recirc valves receive a signal to modulate OPEN.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.15 (1.00)

Which one of the following conditions will NOT cause letdown isolation?

a. High temperature downstream of the regenerative heat exchanger.

b. High Delta P across the Letdown heat exchanger.

c. High Delta P across the Regenerative heat exchanger.

d. SIAS.

QUESTION 6.16 (1.00)

Indicate whether the following statements regarding the main steam system apply to Unit 1, Unit 2, Both Units, or Neither Unit.

a. A check valve downstream of the MSIV is utilized to prevent backflow of steam from the other S/G if a steam break were to occur upstream.

b. 8 Safety Valves, divided into two groups that will lift at different pressures, are located on each steam line upstream of the MSIV.

c. The atmospheric steam dump isolation valves can be remotely operated from the control room.

d. Total capacity of the atmospheric dump valves is 10% steam flow.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.17 (1.00)

Which ONE of the following is a CORRECT statement concerning the operation of the Component Cooling Water Pumps 1A & 1B ISOLATE-NORMAL switches?

a. With the ISOLATE-NORMAL switch in NORMAL, both the control room switch and the switchgear CLOSE-TRIP switch can be used to start or stop the pump.

b. With the ISOLATE-NORMAL switch in ISOLATE, the control room switch, automatic actuation features and the switchgear mounted CLOSE-TRIP switches are rendered inactive.

c. The automatic actuation features on the pumps will function with the ISOLATE-NORMAL switch in either position.

d. With the ISOLATE-NORMAL switch in NORMAL, the local switchgear CLOSE-TRIP switch is rendered inactive.

QUESTION 6.18 (1.00)

Which one of the following statements concerning the operation of the AFW system is correct?

a. If the Unit 2 CST is cross-tied to supply the Unit 1 AFW pumps suction header, the water in the Unit 2 CST will be transferred to the Unit 1 CST.

b. When manually started, the 1C AFW pump will automatically come up to normal operating speed of approximately 3600 rpm.

c. The Turbine Driven Aux. Feedwater Pumps can only be controlled from the RTGB or locally at the pump.

d. Both Unit 1 and Unit 2's Motor driven AFW pumps have the capability, in the control room, of being cross-tied to feed either or both steam generators.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.19 (1.00)

Which one of the following is the required action in TS, if the portion of the fire suppression Spray/Sprinkler system that protects the Diesel Generator Building is declared inoperable while the DGs are required to be operable?

a. Commence a Unit shutdown within one hour.

b. Establish a bi-hourly fire watch patrol for the effected area.

c. Establish a fire watch with backup fire suppression equipment around redundant equipment within one hour.

d. Log ambient temperature readings for the effected area hourly.

QUESTION 6.20 (1.00)

Which ONE of the following conditions will NOT result in an Emergency Diesel Generator lockout?

a. Engine overcrank.

b. Engine overspeed.

c. Generator overcurrent.

d. Generator reverse power.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.21 (1.00)

Which one of the following is required for the Emergency Diesel Generator to be aligned for automatic control (the normal standby condition)?

a. Governor Remote Control switch in the 'ISOLATE' position.

b. Voltage Regulator Remote Control switch in the 'ISOLATE' position. (Unit one)

c. Idle Start Mode Selector switch in the 'MANUAL' position.

d. Start circuit switch in the 'NORMAL'/'ISOLATE' position.

QUESTION 6.22 (1.00)

Which one of the following is correct concerning the operation of the Emergency Diesel Generator?

a. The 4.16 kv safety buses are automatically separated from the non-safety supply buses when an ESFAS is generated.

b. If a surveillance test is being performed, and Offsite AC power is lost, the Emergency Diesel Generator breaker will remain closed and the automatic load sequence will begin.

c. The automatic selection of loads is identical whether the automatic start signal is 'loss of voltage', 'ESFAS', or the combination of the two signals.

d. Upon the loss of Offsite AC power, with the Diesel in the 'Standby' mode the Diesel's will start, previously running loads will be automatically loaded on the the Diesels through individual timing relays.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.23 (1.00)

The Emergency buses (1A3,1AB, and 1B3) are protected:

a. against reverse current by relays that trip the incoming breakers.

b. by a bus lockout relay that actuates on an undervoltage condition.

c. against an under voltage condition by an inverse time voltage relay.

d. by a bus lockout relay that actuates on an overcurrent condition.

QUESTION 6.24 (1.00)

Upon initiation of a Recirculation Actuation Signal the Containment Spray pumps are protected from a loss of suction by:

a. a pressure switch that will trip the pumps on low suction pressure.

b. Minimum flow recirculation valves that direct water from the discharge back to the suction of the pumps.

c. Ensuring the sump isolation valves are open fully prior to the RWT isolation valves starting to close.

d. Ensuring the sump isolation valves open quicker than the RWT isolation valves close.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.25 (1.00)

Choose the CORRECT statement concerning the method used to inject NAOH or Hydrazine into the Containment Spray System for Unit 1 or Unit 2.

a. Unit 1 uses Nitrogen cover gas pressure as a motive force for injecting the NAOH.

b. Unit 2 uses eductor action to inject the Hydrazine.

c. Unit 1 uses gravity feed to inject the NAOH.

d. Unit 2 uses a pump to pump from the Hydrazine storage tank.

QUESTION 6.26 (1.00)

The RCS pressure control system (Channel X&Y) provides signals for which one of the following groups of controls?

a. Spray valves, backup heaters, and proportional heaters.

b. Backup heaters, high pressure relief open signal, and shutdown cooling interlock.

c. Proportional heaters, high pressure relief open signal, and safety injection interlock.

d. Shutdown cooling interlock, safety injection interlock, and spray valves.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.27 (1.00)

When the Pressurizer Backup Heater Interlock Bypass Switch on Unit 2 is in the 'LOCKED OFF' position:

a. The pressure AND level trips for B1 and B4 backup heaters are overriddren.

b. Only the pressure trips are overidden for the B1 and B4 backup heaters.

c. Only the level trips are overridden for the B1 and B4 backup heaters.

d. Neither the pressure and level trips are overridden the B1 and B4 backup heaters may be tripped.

QUESTION 6.28 (1.00)

Tavg is used as the index for programmed pressurizer level, as opposed to Tref, because:

a. Tavg instrumentation is more accurate than Tref instrumentation.

b. Tavg instrumentation is more reliable than Tref instrumentation.

c. The change in Tavg is what directly causes the change in coolant volume.

d. The Tavg response is more linear than the Tref response.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.29 (1.00)

Which one of the following Unit 1 Area Radiation Monitors will actuate a Containment Isolation Signal?

a. Control Room ARMs

b. Containment ARMs

c. Post LOCA ARMs

d. Containment High Range ARMs

QUESTION 6.30 (1.00)

Which one of the following combinations of Unit 2 Containment Cooling Fans is correct?

	Condition	No. of Fans	Speed
a.	Normal	3	Fast
	SIAS	4	Slow
b.	Normal	3	Slow
	SIAS	4	Fast
c.	Normal	4	Slow
	SIAS	3	Fast
d.	Normal	4	Fast
	SIAS	3	Slow

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.31 (1.00)

Indicate which one of the following is a correct definition of "Site Area Emergency".

a. Major failure of systems that are needed to protect the public with potential for limited uncontrolled releases.

b. Major failure of systems that are needed to protect the public and potential for significant uncontrolled releases.

c. Substantial plant degradation with potential for limited uncontrolled releases.

d. Substantial plant degradation and potential for significant uncontrolled releases.

QUESTION 6.32 (1.00)

During plant emergencies which create the potential for release of radioactive material to the environment, the emergency coordinator or his designee is responsible for: (select one of the following)

a. ensuring that off site monitoring is performed.

b. informing the appropriate off site agencies concerning off site field monitoring data.

c. the direction of the off site monitoring team to ensure that their exposures are within 10 CFR 20 limits.

d. comparing estimated dose projections obtained from field measurements to those based on plant release conditions.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.33 (1.00)

Which one of the following conditions require the implementation of and control by the Jumper/Lifted Lead procedure AP-0010124?

a. Continuous physical contact is maintained with a jumper.

b. Leads are lifted for the purpose of removing equipment for repair which is controlled by a PWO.

c. Temporary cables are installed on a receptacle for normal maintainance support activity.

d. Unattended troubleshooting of electronic equipment to permit interim operation.

QUESTION 6.34 (1.00)

Which one of the following is correct concerning Independent Verification of the restoration of valves, locks, and switches?

a. Independent Verification may be waived where functional testing is required to prove operability of the system or component.

b. Independent Verification is required to be performed when any system is restored to normal status following extensive maintenance.

c. Independent Verification may be performed by a Nuclear Plant Operator if the restoration was performed by a Senior Nuclear Plant Operator.

d. Independent Verification need only be documented as being complete in the RCO log and the Nuclear Plant Supervisors Turnover Check Sheet.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.35 (1.00)

Any individual that is permitted to enter a High Radiation Area must satisfy which one of the following to comply with Technical Specifications concerning radiation monitoring?

a. Ensure that containment radiation monitoring equipment is functioning properly.

b. Provided with Thermoluminescent Dosimeters (TLD).

c. Accompanied by an individual qualified in radiation protection procedures.

d. NRC Form 4 on file.

QUESTION 6.36 (1.00)

For valves which are not physically verified in the proper position due to their location inside of containment, AP 1-0010123 "Administrative Control of Valves, Locks and Switches", states "in lieu of physical check, verify status of valves by review of:

a. Rack Key Log".

b. Valve, Switch Deviation Log".

c. In-Plant Equipment Clearance Log".

d. Locked Valve List".

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.37 (1.00)

Which ONE of the following would be a condition which would allow the only licensed operator to leave the area of the carpet in the Unit 1 control room.

a. To get his jacket from his locker.

b. To go to the NWE's office to make a status report.

c. Verify an alarm on the Fire Computer.

d. Log parameters from the meteorological Panel.

QUESTION 6.38 (2.00)

FILL IN THE BLANKS ~~FROM THE RESPONSES BELOW~~ Deleted for this exam only

According to OP-0010122, In Plant Equipment Clearance Orders, permission shall be obtained from ____(1)____ before the ____(2)____ will approve a Release for Test (RFT). If the RFT will extend beyond the originators shift, the originator must either ensure the individual assuming responsibility for the RFT has signed the "Released by:" for the originator and the "Issued to" sections of the RFT OR ____(3)____. If the test is unsatisfactory, the ECO shall be ____(4)____. (NOTE: blanks may require more than one word responses.)

QUESTION 6.39 (2.00)

AP 0010120, "Duties And Responsibilities Of Operators On Shift" procedure provides for an informal shift turnover.

a. Under what conditions/limitations may this be utilized in lieu of a formal shift turnover? (0.5)

b. What information, as a minimum, must be given to the person's relief? (1.5)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

QUESTION 6.40 (2.00)

a. What are the MOST RESTRICTIVE 10 CFR 20 quarterly limits for whole body, skin, and extremities?

b. What is the MAXIMUM QUARTERLY whole body dose permitted and what TWO conditions must be satisfied, according to 10 CFR 20, to permit this radiation exposure?

(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)

ANSWER 4.01 (1.00)

b.

REFERENCE

St. Lucie, Plant Specific Reactor Theory, p 11-4. EO 3 & 4

KAI 3.8/3.9**
192002K114 ..(KA's)

ANSWER 4.02 (1.00)

a.

REFERENCE

St. Lucie, Plant Specific Reactor Theory, p 5-15. EO 4

KAI 3.0/3.2
192007K105 ..(KA's)

ANSWER 4.03 (1.00)

d.

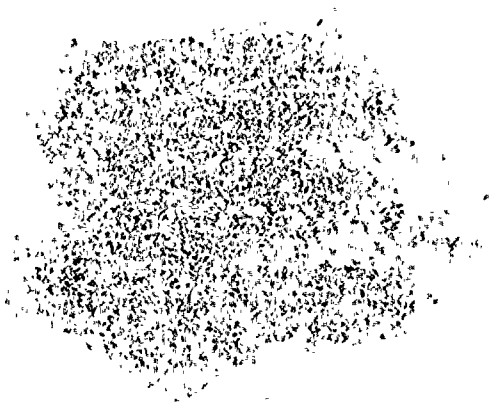
REFERENCE

St. Lucie, Plant Specific Reactor Theory, p 5-18. EO 7

KAI 3.1/3.4
192007K104 ..(KA's)

ANSWER 4.04 (1.00)

c.



(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie, LP 0702106 EO 1n, TS Bases 3.4.1.3.

KAI 3.4/3.9**
192005K115 ..(KA's)

ANSWER 4.05 (1.00)

b. Is the Same As

REFERENCE

St Lucie, LP 0702112 EO 3
Westinghouse Reactor Core Control for Large PWRs, pgs. 9-16 to 9-17

KAI 3.8/3.9**
192008K105 ..(KA's)

ANSWER 4.06 (2.00)

a. As the coolant temperature increases towards the top of the core, the moderator density becomes less [0.35] causing the flux peak to move down in the core [0.35] ASI [is (1-u)/(1+u)] will become more positive as the power is increased. [0.30]

b. 1. Reduce power or Tavg [0.25]
To ensure ASI remains in the control band [0.25]

2. Rods [0.25]
Change flux shape to change value of ASI [0.25]

REFERENCE

St Lucie, LP 0702106 EO 11, TS 3/4 3.2.4
OP 3200021 R-13 Para. 8.4 Note.
KAI 3.0/3.3 3.2/3.5**
192005K114 192005K110 ..(KA's)

ANSWER 4.07 (1.00)

b.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

REFERENCE

St. Lucie, Plant Specific Fluid Flow, p 1-35. EO 15

KAI 3.4/3.6**
193006K104 ..(KA's)

ANSWER 4.08 (1.00)

d.

REFERENCE

St. Lucie, Plant Specific Heat Transfer, Chapter 4, p 4-6. EO 2
LP 07021314 EO 7

KAI 2.9/3.0**
193006K105 ..(KA's)

ANSWER 4.09 (1.00)

b.

REFERENCE

St. Lucie TS Bases 3/4.4.9 NEO
Westinghouse, Thermal-Hydraulic Principles and Applications to the Pressurized Water Reactor II, 1982, pp 13-60 and 13-61. NEO

KAI 2.8/3.2
193010K101 ..(KA's)

ANSWER 4.10 (1.00)

a.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR NEO
SECY 82-475

KAI 2.8/3.0**
193007K104 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.11 (1.00)

d.

REFERENCE

St Lucie, LP 0702123 EO 7, OP 1-3200020.
Westinghouse Thermal Hydraulic Principles and Applications to PWR, p 13-41.

KAI 3.1/3.3 3.1/3.4**
193007K108 193007K106 ..(KA's)

ANSWER 4.12 (1.00)

b.

REFERENCE

St. Lucie TS Bases 3/4.4.9 NEO

KAI 3.8/4.1**
193010K107 ..(KA's)

ANSWER 4.13 (1.00)

1. Temperature OR heatup and cooldown rate
2. Pressure [0.5 each, any order]

REFERENCE

St. Lucie TS Bases 3/4.4.9 NEO
Westinghouse, Thermal-Hydraulic Principles and Applications to the Pressurized Water Reactor II, 1982, pp 13-56,-60 and 13-67.

KAI 3.8/4.1**
193010K107 ..(KA's)

ANSWER 4.14 (1.00)

d.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

REFERENCE

Plant Specific Fluid Flow, p 2-3. EO 1

KAI 2.2/2.4**
191002K101 ..(KA's)

ANSWER 4.15 (1.00)

b.

REFERENCE

Plant Specific Heat Transfer 0711130 Chap. 4. EO 7,8
Plant Specific Fluid Flow 0711140 Chap. 2. EO 10

KAI 2.4/2.5**
191004K105 ..(KA's)

ANSWER 4.16 (1.00)

a.

REFERENCE

Plant Specific Fluid Flow 0711140, Chap. 2, p 2-24. EO 17

KAI 2.5/2.7**
191004K112 ..(KA's)

ANSWER 4.17 (1.00)

b.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KAI 2.2/2.4**
191001K109 ..(KA's)

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

ANSWER 4.18 (1.00)

d.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KAI 2.8/2.9**
191002K114 ..(KA's)

ANSWER 4.19 (1.00)

b.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KAI 3.4/3.5**
191008K108 ..(KA's)

ANSWER 4.20 (1.00)

b.

REFERENCE

SL Question Bank; QNUM 0085

KAI 2.3/2.6**
191003K106 ..(KA's)

ANSWER 4.21 (1.00)

a.

(***** CATEGORY 4 CONTINUED ON NEXT PAGE *****)

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KAI 2.5/2.7**
191006K112 ..(KA's)

ANSWER 4.22 (1.00)

a.

REFERENCE

OP 1-0120023 Section 4.0
RCP Lesson Text 0711202, pp 33-34. EO 13

KAI 3.0/3.1**
191005K106 ..(KA's)

ANSWER 4.23 (1.00)

a.

REFERENCE

Plant Specific Heat Transfer Chapter 8, EO 1.
EQB GENERIC FUNDAMENTALS FOR CE PWR

KAI 2.4/2.6**
191006K107 ..(KA's)

(***** END OF CATEGORY 4 *****)

ANSWER 5.01 (1.00)

c.

REFERENCE

St.Lucie Unit 1, OFF-NORMAL OP, 1-0110030 rev. 19, Appendix A, sec. 5.5, pg. 10.
SL, LP 0702405, EO 7.b; LT 0711405, pgs. 12 - 21.

KAI 3.6/3.3**
000003A103 ..(KA's)

ANSWER 5.02 (1.00)

b.

REFERENCE

SL, LP0702405, EO 7.a.

KAI 3.6/3.8**
000003A203 ..(KA's)

ANSWER 5.03 (1.00)

b.

REFERENCE

St. Lucie Unit 1, 1-EOP-03, Draft 3,step 17(Contingency Actions),pg.11.
SL, LP 0702824, EO 7. & 11.; LT 0711824, pgs. 7, 19 & Fig 18a.

KAI 4.2/4.7
000011A201 ..(KA's)

ANSWER 5.04 (1.00)

d.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

SL, LP 0702824, EO 12.;LT 0711824, p. 27

KAI 3.8/4.2
000011K313 ..(KA's)

ANSWER 5.05 (1.00)

a.

REFERENCE

SL, LP 0702824, EO 3.& 6., II. F.6. pg. 11; LT 0711824, EO 3.& 6., pg. 17.

KAI 4.1/4.2
000011K314 ..(KA's)

ANSWER 5.06 (1.00)

d.

REFERENCE

St. Lucie Unit 2, OFF-NORMAL OP, 2-0120034 rev. 7, step 3.A.,pg. 4.
SL, LP 0702202, EO 1.,10.,13.; LT 0711202, pgs. 28-29 & 36-37.

KAI 3.7/3.7**
000015A210 ..(KA's)

ANSWER 5.07 (1.00)

c.

REFERENCE

St Lucie Unit 1, OFF-NORMAL OP, 1-0250030 rev. 6, p. 2.

KAI 4.1/4.4**
000024K301 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.08 (1.00)

a.

REFERENCE

St.Lucie Unit 1, 1-EOP-01,Draft 2A,Contingency Actions, Step 5.B.,p.7.
St.Lucie Unit 2, 2-EOP-01,Draft 2A,Contingency Actions, Step 5.B.,p.7.
SL, LP 0702823, EO 6, p.15.

KAI 4.1/4.4**
000055K102 ..(KA's)

ANSWER 5.09 (1.00)

b.

REFERENCE

St.Lucie Unit 1, 1-EOP-10,Draft 3, Steps 1,2,3 & 5.,and CAUTION p. 5.

KAI 4.3/4.4
000055K302 ..(KA's)

ANSWER 5.10 (1.00)

c.

REFERENCE

St. Lucie Unit 2 Technical Specifications, Section 3/4.8.3,
pps. 3/4 8-14 to 3/4 8-16. (attached to exam)
SL, LP 0702504, EO 6; LT 0711503(504), pps. 9 - 15, Figs. 2 & 4.

KAI 3.3/3.7**
000057G003 ..(KA's)

ANSWER 5.11 (1.00)

c.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

Lesson PLan 0702811, Safety Function Concept, p 16. EO-5

KAI 4.4/4.6**
000029G011 ..(KA's)

ANSWER 5.12 (1.00)

c.

REFERENCE

St Lucie exam bank validated question 0321

KAI 4.0/4.6**
000074A206 ..(KA's)

ANSWER 5.13 (1.00)

d.

REFERENCE

St.Lucie Unit 1, 1-EOP-06, Rev 1, CAUTION p 5.

KAI 3.4/4.2**
000040K107 ..(KA's)

ANSWER 5.14 (1.00)

b.

REFERENCE

St Lucie Unit 2, TS Bases 3/4.4.8, p B 3/4 4-6.

KAI 2.9/3.6
000076K305 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.15 (1.00)

b.

REFERENCE

St Lucie ONOP 1-0440030, Appendix G, p 43.

KAI 3.4/3.6**
000025G008 ..(KA's)

ANSWER 5.16 (1.00)

b.

REFERENCE

St Lucie ONOP 1-0440030, Figure 2, p 47.

KAI 3.9/4.3
000025K101 ..(KA's)

ANSWER 5.17 (1.00)

d.

REFERENCE

St Lucie ONOP 2-0310031, p 3.

KAI 3.1/3.6**
000009K301 ..(KA's)

ANSWER 5.18 (1.00)

a.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie LP 0702822, p 5; text, p 3. EO 3

KAI 3.7/4.1**
000007K106 ..(KA's)

ANSWER 5.19 (1.00)

d.

REFERENCE

St Lucie ONOP 1-1210030, p 2; 1-1220030, p 2.

KAI 3.3/3.6**
000033A202 ..(KA's)

ANSWER 5.20 (1.00)

c.

REFERENCE

St Lucie ONOP 1-0030136, pp 1,3.

KAI 3.5/3.9**
000058A203 ..(KA's)

ANSWER 5.21 (1.00)

d.

REFERENCE

St Lucie ONOP 1-1010030, pp 3,5,7.

KAI 2.9/3.3
000065A208 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.22 (1.00)

a.

REFERENCE

St Lucie ONOP 1-0700030, p 2.

KAI 4.3/4.4**
000054A201 ..(KA's)

ANSWER 5.23 (1.00)

a.

REFERENCE

St Lucie ONOP 1-0530031, p 3.

KAI 3.8/4.2
000060K303 ..(KA's)

ANSWER 5.24 (1.00)

c.

REFERENCE

St Lucie ONOP 1-0530030, p 4.

KAI 3.2/3.9**
000060G003 ..(KA's)

ANSWER 5.25 (1.00)

c.

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie ONOP 1-1600030, pp 2,3.

KAI 3.4/4.1**
000036A202 ..(KA's)

ANSWER 5.26 (1.00)

a.

REFERENCE

St Lucie Diesel Generators LP 07-11501, Rev 3, pp 8-11. EO 16

KAI 3.5/3.9
000056K301 ..(KA's)

ANSWER 5.27 (0.50)

RPS Trip SWGR Buss Mimic (Trip Status Panel)

REFERENCE

St. Lucie Unit 2, OFF-NORMAL OP, 2-0030131, rev. 14,"Plant Annunciator Summary - Unit 2" pg.89, Window K-4.
SL, LT 0711404, EO 4., pg. 38.

KAI 4.2/4.2 [000001A201]
KAI 3.7/4.2 [001000K603]
001000K603 000001A201 ..(KA's)

ANSWER 5.28 (2.00)

a. 2.
b. 4.
c. 2.
d. 2. [0.5 each]

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

REFERENCE

St.Lucie Unit 1, OFF-NORMAL OP, 1-0250030 rev. 6, p. 3.
SL, LP 0702205, EO 3.d.;LT 0711205, pp. 27-35, Fig. 24.

KAI 2.7/2.7**
000024K201 ..(KA's)

ANSWER 5.29 (1.50)

a. 2
b. 2
c. 10
d. 7
e. 6
f. 5 [0.25 each]

REFERENCE

St Lucie ONOP 1-0120035, Rev 10, p 2.

KAI 3.7/4.1**
000027K303 ..(KA's)

ANSWER 5.30 (1.00)

1. lifting of the Main Steam Safeties

2. the leak flow from the RCS. [0.5 each]

REFERENCE

St Lucie LP 0702825, pp 8,10. EO 7

KAI 4.1/4.3 4.4/4.5**
000038K302 000038K301 ..(KA's)

(***** CATEGORY 5 CONTINUED ON NEXT PAGE *****)

ANSWER 5.31 (2.00)

a. 1. 7 inches [0.5] [0.25]

b. 1) time-dependent long term power distributions. [0.5] [0.25]

2) available Shutdown Margin. [0.5]

3) ejected CEA worth. [0.5]

REFERENCE

St.Lucie Unit 2 Technical Specifications, LCO 3.1.3.1 [pg.3/4 1-18] and BASES 3/4.1.3, para. 4 [pg. B 3/4 1-3].

KAI 3.6/4.1 [000005K303]
KAI 2.5/3.6 [000005G004]
KAI 3.1/3.6 [000005G003]**
000005G003 000005K303 000005G004 ..(KA's)

(***** END OF CATEGORY 5 *****)

ANSWER 6.01 (1.00)

c.

REFERENCE

RCP Lesson Text 0711202, p 35.

KAI 3.3/3.6**
003000G010 ..(KA's)

ANSWER 6.02 (1.00)

d.

REFERENCE

RCP Lesson Text, p 30. EO 13

KAI 3.0/3.3**
003000K112 ..(KA's)

ANSWER 6.03 (1.00)

b. c,

REFERENCE

CEDS Lesson Text 0711405, p 15. EO 5

KAI 3.8/3.8**
001000K402 ..(KA's)

ANSWER 6.04 (1.00)

c.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

ESFAS Lesson Text, Figure 16. EO 2

KAI 3.9/4.4**
013000K403 ..(KA's)

ANSWER 6.05 (1.00)

b.

REFERENCE

ESFAS Lesson Text, p 18. EO 9

KAI 3.7/4.1**
013000K407 ..(KA's)

ANSWER 6.06 (1.00)

d.

REFERENCE

ECCS Lesson Text, p 34. EO 2
PSL Question bank QNUM 0670

KAI 4.2/4.3**
006000K103 ..(KA's)

ANSWER 6.07 (1.00)

a.

REFERENCE

SBCS Lesson Text, p 19. EO 2
PSL Question Bank QNUM 0200

KAI 2.5/2.8**
041020K414 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.08 (1.00)

a.

REFERENCE

NIS Lesson Text, p 18. EO 17
PSL Question Bank QNUM 0345

KAI 3.7/3.8**
015000K407 ..(KA's)

ANSWER 6.09 (1.00)

b.

REFERENCE

CCWS Lesson Text, pp 42-46. EO 2

KAI 3.3/3.4**
008000K102 ..(KA's)

ANSWER 6.10 (1.00)

d.

REFERENCE

RCS Lesson Text, pp 36-37. EO 13

KAI 4.4/4.6**
002020A301 ..(KA's)

ANSWER 6.11 (1.00)

c.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

RPS Lesson Text, Fig. 27. EO 3

KAI 3.3/3.4**
012000A402 ..(KA's)

ANSWER 6.12 (1.00)

b.

REFERENCE

ECCS Lesson Text, p 16. EO 12

KAI 3.4/3.9**
006000K602 ..(KA's)

ANSWER 6.13 (1.00)

d.

REFERENCE

125 VDC Lesson Text, p 4. EO 2

KAI 2.9/3.1**
063000K201 ..(KA's)

ANSWER 6.14 (1.00)

d.

REFERENCE

CVCS Lesson Text, p 24. EO 9

KAI 2.7/3.0**
004010K606 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.15 (1.00)

b.

REFERENCE

CVCS Lesson Text, p 24. EO 12

KAI 3.7/4.2**
004000K509 ..(KA's)

ANSWER 6.16 (1.00)

a. Unit 1

b. Both Units

c. Unit 2

d. Neither unit [0.25 ea.]

REFERENCE

Lesson Plan 07-02304 pg. 12 EO 3
Main Steam PSL QNUM 0191
KAI [3.1/3.2] *
KAI [3.3/3.3] *
KAI [3.3/3.6] *
000039K406 039000K101 039000K102 ..(KA's)

ANSWER 6.17 (1.00)

d.

REFERENCE

CCWS Lesson Text, p 39. EO 3

KAI 3.3/3.1**
008000A401 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.18 (1.00)

a.

REFERENCE

Auxiliary Feed Water Lesson Text, pp 12-13. EO 1

KAI 3.9/3.9**
061000A104 ..(KA's)

ANSWER 6.19 (1.00)

c.

REFERENCE

St. Lucie Tech Specs 3.7.1.4

KAI 3.0/3.6
086000G005 ..(KA's)

ANSWER 6.20 (1.00)

a.

REFERENCE

Diesel Generator Lesson Text, pp 41-42. EO 17

KAI 3.8/4.1**
064000K401 ..(KA's)

ANSWER 6.21 (1.00)

d.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

Diesel Generator Surveillance Procedure.
Diesel Generator Lesson Text, p 40. EO 13

KAI 3.1/3.2**
064000A405 ..(KA's)

ANSWER 6.22 (1.00)

d.

REFERENCE

Diesel Generator Lesson Text, pp 10-11. EO 16

KAI 3.6/3.7**
064000A307 ..(KA's)

ANSWER 6.23 (1.00)

c.

REFERENCE

Main Power Distribution Lesson Text, p 13-14. EO 3

KAI 2.7/3.0**
062000A208 ..(KA's)

ANSWER 6.24 (1.00)

d.

REFERENCE

ECCS Lesson Text, p 44. EO 3

KAI 3.8/4.1**
026020K402 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.25 (1.00)

d.

REFERENCE

ECCS Lesson Text, p 43. EO 18

KAI 3.5/3.7**
026000G007 ..(KA's)

ANSWER 6.26 (1.00)

a.

REFERENCE

Pressurizer Pressure and Level Control Lesson Text, p 48. EO 6

KAI 3.4/3.4**
010000G007 ..(KA's)

ANSWER 6.27 (1.00)

d.

REFERENCE

Pressurizer Pressure and Level Control Lesson Text, pp 21-22. EO 6

KAI 3.6/3.4**
010000A402 ..(KA's)

ANSWER 6.28 (1.00)

c.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

Pressurizer Pressure and Level Control Lesson Text, p 54. EO 2

KAI 3.1/3.3**
011000A104 ..(KA's)

ANSWER 6.29 (1.00)

b.

REFERENCE

ARM Lesson Text, p 11. EO 6

KAI 3.3/3.6**
072000K401 ..(KA s)

ANSWER 6.30 (1.00)

a.

REFERENCE

ECCS Lesson Text, p 27. EO 14

KAI 4.1/4.3**
022000A301 ..(KA's)

ANSWER 6.31 (1.00)

b.

REFERENCE

PSL validated question 0234

KAI 3.1/4.4
194001A116 ..(KA's)

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

ANSWER 6.32 (1.00)

a.

REFERENCE

SL, EPIP-3100355, rev 3, p 2.

KAI 3.1/4.4
194001A116 ..(KA's)

ANSWER 6.33 (1.00)

d.

REFERENCE

SL, AP0010124, rev 20, pp 1,2

KAI 3.7/4.1
194001K102 ..(KA's)

ANSWER 6.34 (1.00)

a.

REFERENCE

FP&L Admin Procedure 1-10123, p 4.

KAI 3.6/3.7
194001K101 ..(KA's)

ANSWER 6.35 (1.00)

c.

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

REFERENCE

FP&L Technical Specification 6.12.

KAI 3.1/3.4
194001K105 ..(KA's)

ANSWER 6.36 (1.00)

b.

REFERENCE

AP 1-0010123, p 4.

KAI 3.6/3.7 **
194001J101 ..(KA's)

ANSWER 6.37 (1.00)

c.

REFERENCE

Admin. Procedure 0010120, p 18.

KAI 2.5/3.4 **
194001A103 ..(KA's)

ANSWER 6.38 (2.00)

1. ALL clearance holders
2. NPS/ANPS/NWE (any one)
3. ensure the ECO is rehung
4. rehung (to the configuration designated on the ECO) [0.5 each]
~~5. RCO~~
~~6. Maintance Foreman/Supervisor~~ } deleted for this exam only
~~7. Released~~

(***** CATEGORY 6 CONTINUED ON NEXT PAGE *****)

a. If ... leave their assigned stations ... two hours. [0.5]

b. ...

... [0.5 each]

... than 5(N-18)
accumulated occupational exposure is documented on NRC Form 4
[0.33 each]

REFERENCE

10 CFR 20.101, p 20-3.

KAI 2.8/3.4
194001K103 ..(KA's)

(***** END OF CATEGORY 6 *****)
(********** END OF EXAMINATION **********)

U. S. NUCLEAR REGULATORY COMMISSION
REACTOR OPERATOR LICENSE EXAMINATION
REGION 2

FACILITY: St Lucie 1 & 2

REACTOR TYPE: PWR-CE

DATE ADMINSTERED: 89/08/22

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Use separate paper for the answers. Write answers on one side only. Staple question sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires at least 70% in each category and a final grade of at least 80%. Examination papers will be picked up six (6) hours after the examination starts.

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE		CATEGORY
25.00	24.94	_____	_____	1.	REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (11%) (FUNDAMENTALS EXAM)
27.00	26.93	_____	_____	2.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (27%)
48.25	48.13	_____	_____	3.	PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)
100.25		_____	_____%		TOTALS
		FINAL GRADE			

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

_____
Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.

2. After the examination has been completed, you must 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. This must be done after you complete the examination.

3. Restroom trips are to be limited and only one candidate at a time may leave. You must avoid all contacts with anyone outside the examination room to avoid even the appearance or possibility of cheating.

4. Use black ink or dark pencil only to facilitate legible reproductions.

5. Print your name in the blank provided in the upper right-hand corner of the examination cover sheet.

6. Fill in the date on the cover sheet of the examination (if necessary).

7. You may write your answers on the examination question page or on a separate sheet of paper. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.

8. If you write your answers on the examination question page and you need more space to answer a specific question, use a separate sheet of the paper provided and insert it directly after the specific question. DO NOT WRITE ON THE BACK SIDE OF THE EXAMINATION QUESTION PAGE.

9. Print your name in the upper right-hand corner of the first page of each section of your answer sheets whether you use the examination question pages or separate sheets of paper. Initial each page.

10. Before you turn in your examination, consecutively number each answer sheet, including any additional pages inserted when writing your answers on the examination question page.

11. If you are using separate sheets, number each answer as to category and number (i.e. 1.04, 6.10) and skip at least 3 lines between answers to allow space for grading.

12. Write "End of Category " at the end of your answers to a category.

13. Start each category on a new page.

14. Write "Last Page" on the last answer sheet.

15. Use abbreviations only if they are commonly used in facility literature. Avoid using symbols such as < or > signs to avoid a simple transposition error resulting in an incorrect answer. Write it out.

16. The point value for each question is indicated in parentheses after the question. The amount of blank space on an examination question page is NOT an indication of the depth of answer required.

17. Show all calculations, methods, or assumptions used to obtain an answer.

18. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK. NOTE: partial credit will NOT be given on multiple choice questions.

19. Proportional grading will be applied. Any additional wrong information that is provided may count against you. For example, if a question is worth one point and asks for four responses, each of which is worth 0.25 points, and you give five responses, each of your responses will be worth 0.20 points. If one of your five responses is incorrect, 0.20 will be deducted and your total credit for that question will be 0.80 instead of 1.00 even though you got the four correct answers.

20. If the intent of a question is unclear, ask questions of the examiner only.

21. When turning in your examination, assemble the completed examination (all examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.

22. To pass the examination, you must achieve an overall grade of 80% or greater and at least 70% in each category.

23. There is a time limit of (6) hours for completion of the examination. (or some other time if less that the full examination is taken.)

24. When you are done and have turned in your examination, leave the examination area as defined by the examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION 1.01 (1.00)

If the reactor is operating in the power range, how long will it take to raise power from 20% to 40% with a +0.5 DPM startup rate?

a. 42 seconds

b. 21 seconds

c. 36 seconds

d. 54 seconds

QUESTION 1.02 (1.00)

Complete the statement by selecting the correct response from the choices listed below.

The Xenon peak that occurs after a reactor trip from 100% equilibrium Xenon condition is greater than the peak for a trip from 50% power equilibrium Xenon condition because:

a. the fission yield for Xenon is higher at 100% power.

b. there are more thermal neutrons in the core at 100% power.

c. there is more Iodine in the core at the time of the trip from 100% power.

d. there are more delayed neutrons in the core at 100% power.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.03 (1.00)

From the choices below, select the ONE that correctly completes the following:

During a Xenon-free reactor startup, critical data was inadvertently taken two decades early (5x10-6). Assume RCS temperature and boron concentration remain the same and critical data is taken at the the proper power level (5x10-4).
Critical Rod position at 5x10-4 _____ Critical Rod position at 5X10-6

a. is less than

b. is the same as

c. is greater than

d. cannot be compared to

QUESTION 1.04 (1.00)

Which ONE of the following correctly describes the effect of an actual stuck out CEA on determining Mode 3 shutdown margin?

a. No effect, since shutdown margin assumes a stuck out rod worth.

b. The worth of the inoperable control rod is added to the hypothetical stuck out rod worth.

c. No effect, since the worth of the inoperable control rod is compensated for by boration.

d. The worth of the inoperable control rod is used to totally replace the hypothetical assumed stuck out rod worth.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.05 (1.00)

Which ONE of the following is NOT one of the three (3) reasons for the CEA Insertion Limit (PDIL)?

a. Maintain acceptable power distribution limits (peaking factors).

b. Ensure that the amount of availiable reactivity for shutdown is maintained.

c. To maintain a linear Rod Worth profile dependent on power.

d. To ensure that CEA ejection effects are limited to acceptable levels.

QUESTION 1.06 (2.00)

a. Explain HOW (more positive or more negative) and WHY Axial Shape Index (ASI) is expected to change as power is increased from 20% to 70% during a normal power increase at BOL. (1.0)

b. Explain what TWO diverse methods are taken to maintain ASI within limits and WHY these actions are effective. (1.0)

QUESTION 1.07 (1.00)

How does critical heat flux vary from the bottom to the top of the reactor core during normal full power operation?

a. Increases, then decreases.

b. Decreases, then increases.

c. Continuously decreases.

d. Continuously increases.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.00 (1.00)

Which ONE of the following is NOT an operational consideration in eliminating or minimizing water hammers?

a. Slow closing of valves.

b. Starting pumps with discharge valves open on a pressurized header.

c. Slow opening of valves.

d. Removing moisture from steam lines.

QUESTION 1.01 (1.00)

Which ONE of the following correctly explains why the primary flowrate is approximately ten times the secondary system flowrate?

a. Primary delta-T is a direct function of the power-to flow ratio.

b. Cp decreases as Tave decreases.

c. Secondary sytem head losses are greater than the primary.

d. Enthalpy rise of the secondary is greater due to the phase change.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.10 (1.00)

The reactor vessel will experience the highest stresses during normal:

a. heatup

b. cooldown

c. steady state

d. refueling

QUESTION 1.11 (1.00)

Voiding has occurred in the RCS, in the vicinity of the reactor vessel during a natural circulation cooldown. Which ONE of the following CORRECTLY characterizes the process of collapsing the void?

a. The void will superheat if an attempt is made to collapse it too fast, the rate of collapse will be governed largely by ambient heat loss from the void.

b. The void will collapse at a rate equivalent to the rate of HPSI flow, therefore, full HPSI should be run until the void is fully collapsed.

c. The void will be composed largely of hydrogen gas, and will therefore require degasifying of the RCS in order to begin collapsing it.

d. The void will collapse immediately upon increasing the pressure above the local saturation pressure; the main concern is water hammer.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.12 (1.00)

Which ONE of the following statements is correct concerning a Primary System Manual calorimetric?

a. If feedwater temperature is read erroneously high, then the calculated reactor power will be higher than actual caused from the considerable additional heat energy provided.

b. The calorimetric equation does not take into consideration the heat added by the reactor coolant pumps, or the heat lost to the containment atmosphere (ambient losses).

c. If a channel of Main Steam Pressure is read erroneously low, then the calculated reactor power will be lower than actual, caused from the lower calculated enthalpy.

d. The results of the secondary calorimetric may be used as the basis for calibration of the power range nuclear instrumentation.

QUESTION 1.13 (1.00)

Fill in the blanks concerning reactor vessel integrity.

The TWO primary parameters which can be controlled to minimize reactor vessel stress during normal operations are ___(1)___ and ___(2)___. (1.0)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.14 (1.00)

Which ONE of the following BEST describes the indications that would be observed if a centrifugal pump was started and operated with its discharge valve shut as compared to with its discharge valve open. (Assume no recirculation flow.)

a. Higher starting current and lower running amperage

b. Lower starting current and lower running amperage

c. Higher starting current and higher running amperage

d. Lower starting current and higher running amperage

QUESTION 1.15 (1.00)

Which ONE of the following statements concerning heat exchanger operation is NOT correct?

a. Once the normal operating condition for a heat exchanger has been established UA becomes approximately a fixed value throughout the life of the heat exchanger.

b. If the Delta T across a heat exchanger is not constant then the Log Mean Temperature Difference (LMTD) is used to accurately calculate the heat transfer rate.

c. The heat removal rate for a heat exchanger will increase if either of the fluid flow rates through the heat exchanger is increased.

d. Hotter fluid gives up energy to colder fluid via conduction and convection.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.16 (1.00)

Which ONE of the following effects will occur as a result of increased fouling of the main condenser tube bundles? (Assume cooling water flow and steam flow rates remain constant)

a. Cooling water outlet temperature will decrease.

b. Condenser hotwell temperature will decrease.

c. Condensate depression will increase.

d. Condenser Heat rejection will increase.

QUESTION 1.17 (1.00)

Which ONE of the following statements about temperature measurement is NOT CORRECT?

a. If the sensing wire of an RTD breaks, the instrument will read offscale high.

b. If a thermocouple wire breaks, the instrument will read off scale low.

c. The temperature range which can be measured by an RTD is smaller than that for a thermocouple.

d. RTDs respond faster to temperature changes than thermocouples.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.18 (1.00)

Which statement BEST describes what happens to a fluid as it passes through a venturi?

a. Pressure remains constant, and the velocity increases as the diameter of the venturi decreases.

b. Pressure increases and velocity decreases as the diameter of the venturi decreases.

c. Pressure increases and velocity remains constant as the diameter of the venturi increases.

d. Pressure increases, and the velocity decreases as the diameter of the venturi increases.

QUESTION 1.19 (1.00)

Assume one Reactor Coolant Pump trips at 30% power without a reactor protective system actuation. Indicate which ONE of the following parameters will DECREASE.

a. Flow in the reactor coolant loops with the RCPs still running

b. Reactor vessel delta P

c. Core delta T

d. The steam flow in the steam generator on the other side

QUESTION 1.20 (1.00)

Pump Runout is defined as a pump that is pumping at:

a. minimum head and maximum flow.

b. maximum head and minimum flow.

c. maximum discharge pressure and zero flow.

d. minimum flow and minimum discharge pressure.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.21 (1.00)

For throttling, globe valves are preferred over gate valves because:

a. the loss coefficient for a full open globe valve is smaller than the loss coefficient for a full open gate valve.

b. the flow characteristics are generally more linear for globe valves than for gate valves.

c. valve position for a mid positioned valve is more reliable for globe valves than for gate valves.

d. valve motor operators are more adaptable to globe valves than to gate valves.

QUESTION 1.22 (1.00)

Which ONE of the following most accurately represents Diesel Generator control?

a. The governor controls the air flow to the engine thereby controlling engine speed.

b. The UNIT mode of governor control allows the diesel generator to operate in the isochronus mode.

c. The DROOP mode of governor control allows the diesel generator to operate in the isochronus mode.

d. The electric governor is the backup to the mechanical governor and is set at a slightly higher speed.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

QUESTION 1.23 (1.00)

Closing a circuit breaker between two electrical generating systems that are out of phase will result in:

a. negating the reverse power protection on the lagging frequency system.

b. a rapid phase alignment which could damage generators and loads connected to the system.

c. a voltage reduction in both generating systems.

d. a reduction of the frequency of the combined generating system.

QUESTION 1.24 (1.00)

Which ONE of the following is CORRECT concerning RCP operations to prevent motor damage from overheating?

a. An RCP should be allowed to reach rated speed before it is tripped except in an emergency.

b. An RCP motor should either be run for 40 min. or stopped for 20 min. to obtain sufficient cooling prior to restarting.

c. An RCP motor may be subjected to THREE consecutive starts if the motor is at a higher than ambient temperature condition.

d. An RCP motor may be subjected to FOUR consecutive starts if the motor is at ambient conditions.

(***** END OF CATEGORY 1 *****)

QUESTION 2.01 (1.00)

Which ONE of the following describes the method for a dropped CEA recovery while maintaining desired reactor power level as detailed in St. Lucie Unit 1 Off-Normal Operating Procedure 1-0110030,"CEA Off-Normal Operation and Realignment"?

a. The affected CEA is withdrawn to the group level by selecting the MANUAL INDIVIDUAL mode and the affected INDIVIDUAL CEA SELECTION pushbutton and then positioning the joystick to WITHDRAW.

b. The affected group is inserted to the full-inserted position by selecting the MANUAL GROUP mode and the affected GROUP SELECTION pushbutton and then the whole group is withdrawn by positioning the joystick to WITHDRAW.

c. While maintaining RX power constant by boration, the CEA should be recovered by slow smooth withdrawal using small increments of movement. The period of time for recovering the CEA should be at least 10 minutes.

d. The affected group is inserted by selecting the MANUAL GROUP mode and the affected GROUP SELECTION pushbutton; and this movement is alternated with insertion of non-affected groups by selecting AUTO SEQUENTIAL mode and ensuring the non-affected groups move as required.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.02 (1.00)

St. Lucie Unit 1 has been operating normally for a long period at 100% power. A transient occurs that has the following effects:

Reactor power decreased slightly,
RCS Tave decreased slightly,
Digital Data Processing System shows flux lower for a single detector location.

Which ONE of the following events caused the transient with the above indications ?

a. An inadvertent boration.

b. A dropped CEA.

c. A tripped RCP.

d. A trip of both heater drain pumps.

QUESTION 2.03 (1.00)

Which ONE of the following conditions is a direct symptom of a situation that requires emergency boration, as described in Off-Normal Operating Procedure No. 1-0250030, EMERGENCY BORATION?

a. RCS subcooled margin slowly lowering at full-power operation.

b. A shutdown CEA drops fully inserted on reactor startup.

c. RCS Tavg decreases abnormally after a normal reactor trip.

d. A regulating CEA is above its PDIL at 25% power operation.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.01 (1.00)

Which ONE of the following is an indication that Natural Circulation is being established.

a. Thot is stable and Tcold is decreasing steadily.

b. Thot and Tcold are increasing steadily at the same rate.

c. Thot is increasing steadily and Tcold is decreasing steadily.

d. Thot is stable and Tcold is increasing steadily.

QUESTION 2.02 (1.00)

Which ONE of the following conditions requires entry into the ACTION STATEMENT for Onsite Power Distribution per the attached sections of St. Lucie Unit 2 Technical Specifications? (Assume NORMAL equipment alignment unless otherwise stated)

a. Unit 2 at 100% power; 120 VAC Instrument Buses 2MB, 2MD, 2MB-1, and 2MD-1 are aligned for 10 hours to MCC 2B5 through their bypass transformers, with inverters 2B and 2D de-energized, while 125 VDC battery 2B is on equalize charge.

b. Unit 2 in Mode 5; 125 VDC bus 2A is de-energized and 120 VAC Instrument Buses 2MA, 2MC, 2MA-1, and 2MC-1 are aligned for 36 hours to MCC 2A5 through their bypass transformers.

c. Unit 2 at 3% power; 120 VAC Instrument Buses 2MC and 2MC-1 are aligned for 3 hours to MCC 2A5 through its bypass transformer, with inverter 2C de-energized, while the 125 VDC feeder breaker to the inverter is being replaced.

d. Unit 2 in Mode 6; 120 VAC Instrument Buses 2MB and 2MB-1 are aligned for 15 hours to MCC 2B5 through its bypass transformer, and inverter 2A is de-energized for 4 hours while maintenance is performed on the 125 VDC bus 2A under-voltage sensor.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION: 2.01 (1.00)

Which ONE (1) the following is NOT a method used to accomplish the Reactivity Control Safety Function?

a. Insertion of CEA's.

b. Emergency Boration.

c. Shutdown margin calculation.

d. Open the Reactor Trip Breakers locally.

QUESTION 2.02 (1.00)

Which ONE of the following control-room indications available to the operator is a possible indication of a void in the reactor-vessel head, during a natural circulation cooldown at Unit 1?

a. QSPDS Reactor-vessel level monitoring display indicates >100% in the Reactor head region.

b. Significant unexpected pressurizer level decrease while operating auxiliary spray.

c. PZR level decrease while charging to RCS loops.

d. If pressurizer level system is in auto, unanticipated letdown flow less than charging flow.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.08 (1.00)

During a total loss of feedwater condition as described in EOP-0a, "Total Loss of Feedwater Procedure", when restoring steam generator level there is a caution to add feedwater slowly to avoid four potential concerns. Which one of the following is NOT a potential concern?

a. Excessive RCS level and temperature transient.

b. Water hammer in feed sparger.

c. Excessive cooldown rate.

d. Erroneous steam generator level indication.

QUESTION 2.09 (1.00)

What is the purpose of the following precaution as listed in Shutdown Cooling Off-Normal, ONOP 1-0440030?

"If possible two LPSI Pumps should be considered for use while in a mid-loop condition with 3000 gpm flow".

a. So that if one pump fails there is still flow to the RCS.

b. So the effects of vortexing are minimized.

c. So the LPSI pump run time is better equalized.

d. So more heat removal capacity is available to the RCS.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.10 (1.00)

Which ONE of the following is an automatic action associated with an RCP Seal Cooler to CCW leak?

a. High radiation alarm in the CCW system will close the RCP seal cooler discharge valves.

b. High return flowrate from the RCP's alarm will divert the CCW surge tank vent to the chemical drain tank.

c. High return flowrate from the RCP's alarm will close the individual RCP's seal cooler discharge valves.

d. A high delta-T of 20% degrees-F will close the individual RCP's seal cooler discharge valves.

QUESTION 2.11 (1.00)

Why is there a possibility of core damage if the secondary heat sink is not reestablished and maintained after an automatic reactor trip from full power?

a. Initially the reduction in secondary load occurs more rapidly and reactor power exceeds steam demand.

b. Due to the steam generator level control response from the initial swell on the reactor trip the S/G's will not be fed in automatic with decay heat still to be removed.

c. Since S/G level shrinks on the reactor trip an overfeeding of the S/G may occur isolating feedwater to the S/G on high level with decay heat still to be removed.

d. Because the S/G feedwater control system closes the main feedwater regulating valves on a reactor trip signal, and decay heat removal will cause the S/G's to dryout.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.12 (1.00)

Which ONE of the following alarms is an indication/symptom that a Wide Range Instrumentation channel has malfunctioned and failed HIGH?

a. Reactor nuclear/delta-T power channel deviation.

b. IM/LP channel trip.

c. Reactor high power level channel trip.

d. Reactor power high rate of change trip.

QUESTION 2.13 (1.00)

Which ONE of the following correctly states the effect of the loss of a 125 V DC vital bus with the plant AC power supplied by the auxiliary transformers?

a. All emergency diesels will start.

b. The reactor will not trip.

c. The associated AC buses will be lost, due to breaker control power.

d. The associated diesel generator output breaker, if loaded prior to the loss of the DC bus, will automatically trip open.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.14 (1.00)

Which one of the following is a protective function to prevent a loss of heat sink during a partial loss of feedwater at power? (Assume Unit 1)

a. Reactor trip if S/G level < 39%.

b. Turbine runback due to loss of one heater drain pump with turbine power > 92%.

c. Turbine runback due to loss of one main feedwater pump with turbine power < 50%.

d. Reactor trip if RCS pressure > 2300 psia.

QUESTION 2.15 (1.00)

Select the combination below that correctly completes the following statement.

"With the concentration of oxygen in the on-service gas decay tank > __(1)__ % by volume and the hydrogen concentration >__(2)__% by volume, immediately suspend all additions of waste gases to the system and immediately commence reduction of oxygen to less than or equal to 2% by volume."

a. 2, 1

b. 3, 2

c. 4, 2

d. 6, 4

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.16 (1.00)

Which ONE of the following is NOT an automatic action or symptom associated with an accident involving a spent fuel element inside containment, according to ONOP 1-1600030 "Accidents Involving New Or Spent Fuel" procedure?

a. Containment air high radiation alarms.

b. CIAS signal.

c. Reactor cavity cooling fans will trip.

d. Containment evacuation alarm.

QUESTION 2.17 (1.00)

Which ONE of the following is an action that the Reactor Control Operator "A" will take, after the control room is evacuated, according to the Control Room Inaccessibility procedure 1-0030136?

a. Verify Turbine Throttle Valves and Governor Valves are shut.

b. Start motor or steam driven AFW Pumps and feed the S/G's as required.

c. Place the NORMAL/ISOLATE switches for the motor driven AFW pumps to the ISOLATE position.

d. Place the NORMAL/ISOLATE switch for the 1C Charging Pump to the ISOLATE position.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.18 (1.00)

When VCT level falls below 42%, 1-0250031, "Boron Control Out-Normal," lists Immediate Operator Actions. Select one answer below which is an Immediate Operator Action.

a. Isolate Letdown by closing V-2515 and 2516.

b. Stop all Charging Pumps.

c. Check V-2500 (VCT Divert Valve) aligned to VCT.

d. Isolate VCT by closing V-2501 (VCT Outlet).

QUESTION 2.19 (1.00)

Which ONE of the following criteria would be sufficient to indicate that the RCS Inventory Control Safety Function was NOT being met during performance of EOP-1?

a. Pressurizer level 20% and increasing, subcooling 35 degrees, RX Vessel level is 100%.

b. Pressurizer level 61% and decreasing, subcooling 50 degrees, RX Vessel level is 100%.

c. Pressurizer level 15% and increasing, subcooling 50 degrees, RX Vessel level is 100%.

d. Pressurizer level 15% and stable, subcooling 35 degrees, RX Vessel level is 100%..

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.20 (1.00)

Upon receipt of a 'Pressurizer High-Low, Channel X or Y' alarm, a low pressurizer level is indicated.

According to ONOP 2-0120035, "Pressurizer Pressure and Level - Off Normal", which ONE of the following indications would indicate a possible problem with control of pressurizer level?

a. Letdown isolation valves are open.

b. Charging isolation valves are open.

c. Letdown flow is increasing.

d. Letdown valve limiter bypass switch is in the NORMAL position.

QUESTION 2.21 (1.00)

Select the combination below that CORRECTLY completes the following statement:

In order to prevent damage to an RCP or its seals, extended operation of an RCP is NOT allowed with a loss of CCW to the pump. If CCW flow cannot be restored to the RCP within __ minutes, an AUTOMATIC reactor trip will be generated on _____ ; and after the trip, the operator will stop the affected RCP.

a. 5, Unit 1

b. 5, Unit 2

c. 10, Unit 1

d. 10, Unit 2

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.22 (2.00)

The following valves may be utilized during Emergency Boration as described in Off-Normal Operating Procedure No. 1-0250030, EMERGENCY BORATION. For the given valve in Column I, select the appropriate valve type from Column II. Note: responses from Column II may be used more than once or not at all.

COLUMN I (VALVE)	COLUMN II (VALVE TYPE)
a. V-2525 (Boron Load Control Valve)	1. Local manually-operated
b. V-2510 (QAM Pump Recirc. Valve)	2. Remote motor-operated
c. V-2514 (Emergency Borate Valve)	3. Remote solenoid-operated
d. V-2509 (Gravity Feed Borate Valve)	4. Remote air-operated

QUESTION 2.23 (1.00)

Match the automatic actions on abnormal pressurizer pressure in Column A to the associated setpoint in Column B. Note: setpoints may be used more than once or not at all. (Assume Unit 1)

Column A (Action)	Column B (Setpoint, psia)
a. High pressure reactor trip.	1. 2500
	2. 2400
b. Power operated reliefs open.	3. 2340
	4. 2220
c. SIAS initiates.	5. 2200
	6. 2100
d. TM/LP reactor trip minimum setpoint.	7. 1887
	8. 1800
	9. 1660
	10. 1600
	11. 1500

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

QUESTION 2.24 (1.00)

Fill In The Blanks.

During implementation of EOP-4 (SGTR) the RCS is cooled down to < 525 degrees That to prevent ___(1)___ . The RCS pressure is lowered to plus or minus 50 psia of the isolated steam generator to minimize __ (2)___ . (Note: More than one word answers required)

QUESTION 2.25 (2.00)

a. St. Lucie Unit 2 Technical Specifications requires all full-length CEAs inserted into the core to be OPERABLE with each CEA of a given group positioned within ___ inches of all other CEAs in its group. (Choose one) (0.5)

1. 7 inches
2. 8 inches
3. 9 inches
4. 10 inches

b. List THREE parameters utilized in the safety analysis which are effected by a small misalignment (less than 15"): (1.5)

(***** END OF CATEGORY 2 *****)

QUESTION 3.01 (1.00)

Choose the CORRECT answer for Unit One Operation.

a. During a reactor startup, CEA Motion Inhibit due to a CEA group being out of sequence is cleared by switching to the Manual Group Mode.

b. Manual Individual is used to return a group of CEA's to the proper sequence or overlap.

c. It is not necessary to use the "Motion Inhibit bypass pushbutton" when inserting CEA's whose motion is inhibited by an inoperable CEA.

d. "Motion Inhibit Bypass" operation is necessary when the "CEDS Logic Cabinets DC Control Voltage Failure" alarm is in.

QUESTION 3.02 (1.00)

The reason for the requirement for the RCS temperature to be >500 F prior to starting the 4th RCP is:

a. Prevent RCP cavitation due to insufficient Net Positive Suction Head.

b. Prevent an inadvertent reactivity increase due to cold water entering the core.

c. Prevent an upward shift of the fuel assemblies.

d. Prevent an inadvertent pressure transient that may exceed RCS Technical Specification limits.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.03 (1.00)

Which ONE of the following is TRUE concerning the Center Amber Lamp associated with the RCP start controls?

a. Indicates that the RCP breaker is in the "Racked In" Position.

b. Indicates that 6.9 KV power is available at the RCP breaker.

c. Indicates that 125 vdc power is available to the RCP start circuit.

d. Indicates that sufficient CCW flow and oil lift pressure are available to the pump.

QUESTION 3.04 (1.00)

Which ONE of the following on Unit 1 is NOT an action caused by a Main Steam Isolation Signal (MSIS)?

a. Close the Main Steam Isolation Valves.

b. Close the Main Feed Isolation Valves.

c. Close the Main Feed Regulating Valves.

d. Close the Main Feed Pump Discharge Valves.

QUESTION 3.05 (1.00)

The Engineered Safety Feature Actuation System Signal whose actuation relays are ENERGIZED to actuate is the:

a. Safety Injection Actuation Signal (SIAS).

b. Containment Spray Actuation Signal (CSAS).

c. Main Steam Isolation Signal (MSIS).

d. Containment Isolation Actuation Signal (CIAS).

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.06 (1.00)

Which statement correctly describes the conditions necessary for a main feedwater pumps to trip?

a. If both main feedwater pumps were in operation with the total feed water flowrate at 40% of full power flowrate and if one of the two operating condensate pumps tripped, then one feedwater pump should trip.

b. If the suction pressure for an operating main feedwater pump has dropped to 275 psig the feedwater pump should trip.

c. If the flowrate of an operating main feedwater pump has reached 5000 gpm the feedwater pump should trip.

d. If the lube oil pressure of an operating main feedwater pump has dropped to six psig the feedwater pump should trip.

QUESTION 3.07 (1.00)

Which ONE of the following best describes the primary flowpath for hot leg injection on Unit 1?

a. Containment spray pump discharge to 'A' HPSI discharge to LPSI hot leg suction line to hot leg.

b. HPSI pump takes suction on containment sump and discharges to hot leg via auxiliary spray.

c. Charging pump takes suction on RWT and discharges via auxiliary spray.

d. 'B' LPSI pump discharges through "A" train warmup valve to 'A' LPSI hot leg suction valves.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.03 (1.00)

Which ONE of the following statements is correct concerning the Steam Bypass Control System?

a. With all controllers in manual, the quick open signal is disabled.

b. The system will generate a full open modulation signal if the steam pressure transmitter in the actuations channel fails high.

c. The sequence for valve opening with a full modulation signal present is:

1. 5% valve opens fully
2. first 10% valve opens fully
3. second 10% valve opens fully
4. third and fourth 10% valve opens fully

d. With the permissive switch in off, a quick open signal will still operate the valves.

QUESTION 3.09 (1.00)

Which ONE of the following is CORRECT concerning the Excore Nuclear Instrument Channels?

a. At $\geq 10^{-4}$% power, the Unit 1 and Unit 2 wide range NI's enable the SUR trip.

b. The Zero Power Mode Bypass blocks Delta T power, bypasses low flow and S/G pressure trips at < .5% on Unit 2.

c. Both Units use the wide range fission chambers to monitor counts during refueling operations.

d. Zero Power Mode Bypass comes from the wide range on Unit 2 and the linear range on Unit 1.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.10 (1.00)

Upon failure of a Linear Power Safety Channel the bistable that does NOT need to be placed in the BYPASSED position is the:

a. Dropped CEA.

b. TM/LP.

c. Loss of Load.

d. Local Power Density.

QUESTION 3.11 (1.00)

Which ONE of the following is a CORRECT statement concerning the Component Cooling Water (CCW) system differences between Units 1 and 2?

a. A low level in the CCW system surge tank will isolate the non-essential header at Unit 1, while this is not the case for Unit 2.

b. The fuel pool heat exchanger is supplied from A or B header at Unit 2 and for Unit 1 it is supplied by the non-essential header.

c. The A and B headers at Unit 1 supply CCW to the control room air conditioners and for Unit 2 the conditioners are air cooled.

d. The instrument air compressor (inside containment) at Unit 1 is supplied with CCW from the non-essential header, for Unit 2 it is supplied CCW from the essential header.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.12 (1.00)

Which ONE of the following is CORRECT concerning the Unit 1 and Unit 2 RCS cold leg temperature measurements?

a. Unit 1 control channel will signal an automatic withdrawal prohibit (AWP) on high temperature and Unit 2 control channel will not generate an AWP.

b. Both Unit 1 and Unit 2 control channels supply inputs to the Reactor Regulating System for the low power auto rod motion inhibit circuit.

c. Unit 1 and Unit 2 control channels are an input to the Control Element Drive System, used to generate a CWP signal.

d. Unit 1 control channels supply input to the OMS, Unit 2 control channels supply input to LTOPS.

QUESTION 3.13 (1.00)

Which ONE of the following reactor trips DOES NOT receive an input from the core protection calculators?

a. Thermal margin/low pressure

b. Local power density

c. High rate of change of power

d. Variable high power

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.14 (1.00)

Which ONE of the following statements concerning the Unit 1 LPSI/shutdown cooling system is correct?

a. The hot leg suction valves to the LPSI pumps automatically close at a decreasing RCS pressure of 500 psig.

b. The LPSI pumps can be used in fill and makeup to the SITs with RCS pressure less than 1500 psig.

c. When using the system for shutdown cooling, purification of the RCS coolant using the CVCS demineralizers is not available.

d. The LPSI pumps start automatically on SIAS and are stopped automatically when RCS temperature reaches 325 degrees.

QUESTION 3.15 (1.00)

The 125 VDC systems are normally lined up such that:

a. the C train is powered from either of the A or B buses via the swing bus AB in unit 2.

b. the swing bus AB is powered from the A side train in unit 1.

c. the battery charger AB is connected to the A side train in unit 2.

d. the swing bus AB is powered from the A side train in unit 2.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.16 (1.00)

The shutdown cooling heat exchangers are used to remove heat during cooldown:

a. if the pressure is < 1500 psia and the temperature is < 500 F.

b. if the CCW inlet temperature is < 55 degF.

c. with the cooldown rate controlled by throttling the SDC return valves to the LPSI headers.

d. with the cooldown rate controlled by throttling the CCW flow control valves to the SDC heat exchangers.

QUESTION 3.17 (1.00)

Which ONE of the following statements is CORRECT concerning the Motor Operated Recirculation Valves on the charging pumps?

a. When the charging pumps receive a START signal from the Control Room, the corresponding recirc valves receive a signal to modulate OPEN.

b. When the charging pumps receive a STOP signal from the Control Room, the corresponding recirc valves receive a signal to modulate CLOSED.

c. When the charging pumps receive a START signal from the Pressurizer Level Control System, the corresponding recirc valves receive a signal to modulate OPEN.

d. When the charging pumps receive a STOP signal from the Pressurizer Level Control System, the corresponding recirc valves receive a signal to modulate OPEN.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.18 (1.00)

Which ONE of the following conditions will NOT cause letdown isolation?

a. High temperature downstream of the Regenerative heat exchanger.

b. High Delta P across the Letdown heat exchanger.

c. High Delta P across the Regenerative heat exchanger.

d. SI/S.

QUESTION 3.19 (1.00)

Indicate whether the following statements regarding the main steam system apply to Unit 1, Unit 2, Both Units, or Neither Unit.

a. A check valve downstream of the MSIV is utilized to prevent backflow of steam from the other S/G if a steam break were to occur upstream.

b. 8 Safety Valves, divided into two groups that will lift at different pressures, are located on each steam line upstream of the MSIV.

c. The atmospheric steam dump isolation valves can be remotely operated from the control room.

d. Total capacity of the atmospheric dump valves is 10% steam flow.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.20 (1.00)

Which ONE of the following is a CORRECT statement concerning the operation of the Component Cooling Water Pumps 1A & 1B ISOLATE-NORMAL switches?

a. With the ISOLATE-NORMAL switch in NORMAL, both the control room switch and the switchgear CLOSE-TRIP switch can be used to start or stop the pump.

b. With the ISOLATE-NORMAL switch in ISOLATE, the control room switch, automatic actuation features and the switchgear mounted CLOSE-TRIP switches are rendered inactive.

c. The automatic actuation features on the pumps will function with the ISOLATE-NORMAL switch in either position.

d. With the ISOLATE-NORMAL switch in NORMAL, the local switchgear CLOSE-TRIP switch is rendered inactive.

QUESTION 3.21 (1.00)

Which ONE of the following statements correctly describes how to reset the MECHANICAL overspeed trip lever on the turbine driven AFW pump?

a. It must be reset locally, after driving the limitorque to the open position, to relatch the linkage.

b. It must be reset locally by using a lever to relatch the linkage.

c. It will reset automatically as turbine speed decreases below a pre-determined setpoint.

d. It may be reset locally, but can also be reset from a switch on RTGB 102 in the control room.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.22 (1.00)

Which ONE of the following statements concerning the operation of the AFW system is CORRECT?

a. If the Unit 2 CST is cross-tied to supply the Unit 1 AFW pumps suction header, the water in the Unit 2 CST will be transferred to the Unit 1 CST.

b. When manually started, the 1C AFW pump will automatically come up to normal operating speed of approximately 3600 rpm.

c. The Turbine Driven Aux. Feedwater Pump can only be controlled from the R16B or locally at the pump.

d. Both Unit 1 and Unit 2's Motor driven AFW pumps have the capability, in the control room, of being cross-tied to feed either or both steam generators.

QUESTION 3.23 (1.00)

Which ONE of the following conditions will NOT result in an Emergency Diesel Generator lockout?

a. Engine overcrank

b. Engine overspeed

c. Generator overcurrent

d. Generator reverse power

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.24 (1.00)

Which ONE of the following is required for the Emergency Diesel Generator to be aligned for automatic control (the normal standby condition)?

a. Governor Remote Control switch in the 'ISOLATE' position.

b. Voltage Regulator Remote Control switch in the 'ISOLATE' position. (Unit one)

c. Idle Start Mode Selector switch in the 'MANUAL' position.

d. Start Circuit switch in the 'NORMAL'/'ISOLATE' position.

QUESTION 3.25 (1.00)

Which ONE of the following is CORRECT concerning the operation of the Emergency Diesel Generator?

a. The 4.16 kv safety buses are automatically separated from the non-safety supply buses when an ESFAS is generated.

b. If a surveillance test is being performed, and Offsite AC power is lost, the Emergency Diesel Generator breaker will remain closed and the automatic load sequence will begin.

c. The automatic selection of loads is identical whether the automatic start signal is 'loss of voltage', 'ESFAS', or the combination of the two signals.

d. Upon the loss of Offsite AC power, with the Diesel in the 'Standby' mode the Diesel's will start, previously running loads will be automatically loaded on the the Diesels through individual timing relays.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.26 (1.00)

The Emergency buses (1A3,1AB, and 1B3) are protected:

a. against reverse current by relays that trip the incoming breakers.

b. by a bus lockout relay that actuates on an undervoltage condition.

c. against an under voltage condition by an inverse time voltage relay.

d. by a bus lockout relay that actuates on an overcurrent condition.

QUESTION 3.27 (1.00)

Which ONE of the following statements concerning a loss of the instrument air system is CORRECT?

a. If instrument air is lost to the CCW supply to the RCP's, the valves may be reopened by lining up service air directly to the valves.

b. If instrument air is lost to the CCW supply to the RCP's, the valves may be reopened by using a manual jacking device locally at the valves.

c. If instrument air is lost to the feedwater regulating valves, local control can be attained by valving in nitrogen to the valve operators.

d. If instrument air is lost to the feedwater regulating valves, local control can be attained by using a manual jacking device.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.28 (1.00)

Upon initiation of a Recirculation Actuation Signal the Containment Spray pumps are protected from a loss of suction by:

a. a pressure switch that will trip the pumps on low suction pressure.

b. Minimum flow recirculation valves that direct water from the discharge back to the suction of the pumps.

c. Ensuring the sump isolation valves are open fully prior to the RWT isolation valves starting to close.

d. Ensuring the sump isolation valves open quicker than the RWT isolation valves close.

QUESTION 3.29 (1.00)

Choose the CORRECT statement concerning the difference between the method used to inject hydrazine into the Containment Spray System for Unit 1 and Unit 2.

a. Unit 1 uses Nitrogen cover gas pressure as a motive force for injecting the Hydrazine.

b. Unit 2 uses eductor action to inject the Hydrazine.

c. Unit 1 uses gravity feed to inject the Hydrazine.

d. Unit 2 uses a pump to pump from the Hydrazine storage tank.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.30 (1.00)

When the Pressurizer Backup Heater Interlock Bypass Switch on Unit 2 is in the 'LOCKED OFF' position:

a. The pressure AND level trips for B1 and B4 backup heaters are overriddren.

b. Only the pressure trips are overidden for the B1 and B4 backup heaters.

c. Only the level trips are overridden for the B1 and B4 backup heaters.

d. Neither the pressure and level trips are overridden the F1 and B4 backup heaters may be tripped.

QUESTION 3.31 (1.00)

When the Pressurizer Backup Heater Interlock Bypass Switch is in the 'LOCKED OFF' position:

a. The pressure AND level trips for B1 and B4 backup heaters are overriddren.

b. Only the pressure trips are overidden for the B1 and B4 backup heaters.

c. Only the level trips are overridden for the B1 and B4 backup heaters.

d. Neither the pressure and level trips are overridden the B1 and B4 backup heaters may be tripped.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.32 (1.00)

Tavg is used as the index for programmed pressurizer level, as opposed to Tref, because:

a. Tavg instrumentation is more accurate than Tref instrumentation.

b. Tavg instrumentation is more reliable than Tref instrumentation.

c. the change in Tavg is what directly causes the change in coolant volume.

d. the Tavg response is more linear than the Tref response.

QUESTION 3.33 (1.00)

Which ONE of the following is NOT a function of the Low Pressure Safety Injection (LPSI) pumps?

a. Provide Hot Leg Injection on Unit 1.

b. Provide RCS injection flow following automatic actuation of a recirculation actuation signal (RAS).

c. Provide RCS cooling from Hot Standby to Cold Shutdown.

d. Provide purification flow for the RCS while shutdown.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.34 (1.00)

Which ONE of the following Unit 1 Area Radiation Monitors will actuate a Containment Isolation Signal?

a. Control Room ARMs

b. Containment ARMs

c. Post LOCA ARMs.

d. Containment High Range ARMs

QUESTION 3.35 (1.00)

Which ONE of the following combinations of Unit 2 Containment Cooling Fans is CORRECT?

	Condition	No. of Fans	Speed
a.	Normal	3	Fast
	SIAS	4	Slow
b.	Normal	3	Slow
	SIAS	4	Fast
c.	Normal	4	Slow
	SIAS	3	Fast
d.	Normal	4	Fast
	SIAS	3	Slow

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.36 (1.00)

Match the indication in Column A to the color code on the core mimic display for Unit 1 in Column B.

Column A	Column B
a. Dropped Rod	1. Red
b. Lower electrical limit	2. Green
c. Operating band (Regulating groups)	3. Blue
d. Upper electrical limit	4. Amber
	5. White

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.37 (2.25)

For each of the following conditions (a. and b.) LIST those actuation signals (1. through 5.) that should have automatically occurred. CONSIDER each condition separately. Each condition may have for its answer none, one, or several actuation signals.

1. SIAS
2. CIAS
3. RAS
4. CSAS
5. MSIS

a. A steam line break has occurred in the UNIT 2 containment and

containment pressure = 7 psig
containment radiation = normal background
Pzr pressure = 1800 psig
S/G pressures = 700 psig, 550 psig
RWT level = 15 Feet

b. A LOCA has occurred on UNIT 1 and

containment pressure = 15 psig
containment radiation = 6 R/hr
Pzr pressure = 1300 psig
S/G pressures = 380 psig, 450 psig
RWT level = 3 Feet

Additional ANSWER for part A accepted section and total points increased by 0.25

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.30 (1.00)

A 25 year old radiation worker's total lifetime dose is 34 rem and his NRC Form 4 is up to date. His personal monitoring device is processed after the first week of the quarter with a whole body reading of 500 mrem.

What is the worker's allowable whole body exposure for the remainder of the quarter given the above information?

a. 500 mrem

b. 750 mrem

c. 1.25 rem

d. 2.5 rem

QUESTION 3.31 (1.00)

Which ONE of the following represents the required RCO reading for a complete shift turnover?

a. NWE Log
Night Order Log
Equipment Out of Service Log

b. Turbine Operator Log
Nuclear Operator Log
Control Center Log

c. Control Center Log
Equipment Out of Service Log
NWE Log

d. Control Center Log
Equipment Out of Service Log
Night Order Log

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.40 (1.00)

Which ONE of the following is a condition that would render the clearance released once mechanical and electrical maintenance has been completed on an Auxiliary Feedwater Pump?

a. All temporary grounds have been removed.

b. A temporary ground on the motor remains to facilitate electrical testing.

c. A Danger Tag on the suction valve is the only tag that needs to be lifted.

d. The Electrical Supervisor states that he will release his clearance when the motor power supply breaker has been closed.

QUESTION 3.41 (1.00)

Which ONE of the following may be considered for membership in the site Fire Brigade?

a. Nuclear Watch Engineer

b. Assistant Nuclear Plant Supervisor

c. Reactor Control Operator

d. Nuclear Operator

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION 3.42 (1.00)

Which ONE of the following conditions would require the use of AP 0010124 "Control and Use of Jumpers and Disconnected Leads"?

a. Physically removing a Sigma from service under a signed PWO.

b. Installing a temporary cable on a receptacle to operate air conditioning to support maintenance activities.

c. Maintenance technicians, while troubleshooting, install hand held test instrumentation.

d. Electrically bypassing the Pressurizer Pressure SIAS due to an inoperable keyswitch.

QUESTION 3.43 (1.00)

For valves which are not physically verified in the proper position due to their location inside of containment, AP 1-0010123 "Administrative Control of Valves, Locks and Switches", states "in lieu of physical check, verify status of valves by review of the:

a. Rack Key Log".

b. Valve, Switch Deviation Log".

c. In-Plant Equipment Clearance Log".

d. Locked Valve List".

QUESTION 3.44 (1.00)

An area within the RCA has been determined by Health Physics Personnel to have a Whole Body dose rate of 110 mr/hr. This area should be designated as a:

a. Radiation Area.

b. High Radiation Area.

c. Locked High Radiation Area.

d. Exclusion Area.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

[illegible]

[illegible]

[illegible] proposed [illegible] with:

a. the individual.

b. the individual's immediate supervisor.

c. the Health Physics Department on the individual's [illegible].

d. the Health Physics ALARA Coordinator.

[illegible]

[illegible]

e. [illegible] location.

[illegible]

[illegible] computer.

[illegible] Meteorological Panel.

[illegible]

[illegible] display system (QSPDS) calculates and displays three [illegible] saturation margin monitoring (SMM) values.

Which ONE of the following is NOT displayed on the QSPDS Saturation Margin display page?

a. Reactor Coolant System Saturation Margin

b. Pressurizer Saturation Margin

c. Upper Head Saturation Margin

d. Core Exit Thermocouple Saturation Margin

(***** END OF CATEGORY C *****
********** END OF EXAMINATION **********)

ANSWER 1.03 (1.00)

a.

REFERENCE

Reactor Theory Text p. 8-26
EO 12
KA [2.3/2.3]
20[illegible]000K401 192003K109 192003K109 192003K109 203.000 [illegible]
..(KA's)

ANSWER 1.02 (1.00)

c.

REFERENCE

Reactor Theory Text p. 4-10
EO 3
KA [3.0/3.3]
192006K102 ..(KA's)
217000A404 192006K102 217000A301 192006K102 192006.10[illegible]
..(KA's)

ANSWER 1.03 (1.00)

b.

REFERENCE

St Lucie, LP 0702112 EO 3
Westinghouse Reactor Core Control for Large PWRs, pgs. 9-16 to 9-17

KAI [3.8/3.9] *

192008K105 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.04 (1.00)

b.

REFERENCE

St. Lucie, Plant Specific Reactor Theory, p 11-4. EO 3 & 4

KAI [3.8/3.9]

192002K114 ..(KA's)

ANSWER 1.05 (1.00)

c.

REFERENCE

St Lucie, LP 0702104 EO 1n, TS Bases 3.4.1.3.

KAI [3.4/3.9] *

192005K115 ..(KA's)

ANSWER 1.06 (2.00)

a. As the coolant temperature increases towards the top of the core, the moderator density becomes less [0.35] causing the flux peak to move down in the core [0.35] ASI [is (1-u)/(1+u)] will become more positive as the power is increased. [0.30]

b. 1. Reduce power or Tavg [0.25]
To ensure ASI remains in the control band [0.25]

2. Rods [0.25]
Change flux shape to change value of ASI [0.25]

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.07 (1.00)

d.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

REFERENCE

St. Lucie, Plant Specific Heat Transfer, Chapter 4, p 4-6. EQ 2
LP 07021314 EQ 7

KA1 [2.9/3.0] *

193006K105 ..(KA's)

ANSWER 1.12 (1.00)

b.

REFERENCE

St. Lucie 15 Pages 3/4.4.4 NEO

KA [3.8/4.] .*
193010K107 ..(KA's)

ANSWER 1.11 (1.00)

a.

REFERENCE

EQR GENERIC FUNDAMENTALS FOR CE PWR NEO
SECY 82-475

KA1 [2.8/3.0] *
193007K104 ..(KA's)

ANSWER 1.12 (1.00)

d.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie, LP 0/02123 EO 7, OP 1-3200020.
Westinghouse Thermal Hydraulic Principles and Applications to PWR, p [3-41

KAI [3.1/3.3] [3.1/3.4] *
193007K106 193007K108 ..(KA's)

ANSWER 1.13 (1.00)

1. Temperature OR heatup and cooldown rate

2. Pressure [0.5 each, any order]

REFERENCE

Westinghouse, Thermal-Hydraulic Principles and Applications to the Pressurized Water Reactor II, 1982, pp 13-56,-60 and 13-67.

KAI [3.8/4.1] *

193010K107 ..(KA's)

ANSWER 1.14 (1.00)

b.

REFERENCE

NUS, Nuclear Energy Training, Module 4, Plant Performance
KA [2.7/2.8]
271000K401 2710006007 191005K104 191005K104 191005K104
..(KA's)

ANSWER 1.15 (1.00)

a.

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

REFERENCE

Plant Specific Heat Transfer Chapter 8, EO 1.
DOE GENERIC FUNDAMENTALS FOR CE PWR
KA [2.4/2.6] *
191006K107 191006K107 215004K401 215004K404 215004A3
191006K107 ..(KA's)

ANSWER 1.16 (1.00)

a.

REFERENCE

EOE GENERIC FUNDAMENTALS FOR CE PWR
KA [2.5/2.7] *
215005K611 191006K112 191006K112 191006K112 215005K43
..(KA's)

ANSWER 1.17 (1.00)

d.

REFERENCE

EOE GENERIC FUNDAMENTALS FOR CE PWR
KA [2.8/2.9] *
202002K402 191002K114 2020026007 191002K114 191002K114
..(KA's)

ANSWER 1.18 (1.00)

d

REFERENCE

Plant Specific Fluid Flow p. 2-3
EO 1
KA [2.2/2.4] *
191002K101 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.19 (1.00)

b.

REFERENCE

Plant Specific Heat Transfer 0711130 Chap. 4
EO 7,8
Plant Specific Fluid Flow 0711140 Chap. 2
EO 10
KA [2.4/2.5] *
191004K105 ..(KA's)

ANSWER 1.20 (1.00)

a.

REFERENCE

Plant Specific Fluid Flow 0711140 Chap. 2 p.2-24
EO 17
KA [2.3/2.7] *
191004K112 ..(KA's)

ANSWER 1.21 (1.00)

b.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KA [2.2/2.4] *
191001K109 ..(KA's)

(***** CATEGORY 1 CONTINUED ON NEXT PAGE *****)

ANSWER 1.22 (1.00)

b.

REFERENCE

SL Question Bank: QNUM 0085

KA [2.3/2.6]+ *
191003K106 ..(KA's)

ANSWER 1.23 (1.00)

b.

REFERENCE

EQB GENERIC FUNDAMENTALS FOR CE PWR

KA [3.4/3.5] *
191006K106 ..(KA's)

ANSWER 1.24 (1.00)

a.

REFERENCE

OP 1-0120023 Section 4.0
RCP Lesson Text 0711202 pp.33-34
EO 13.
KA [3.0/3.1] *
191005K106 ..(KA's)

(***** END OF CATEGORY 1 *****)

ANSWER 2.01 (1.00)

c.

REFERENCE

St.Lucie Unit 1, OFF-NORMAL OP, 1-0110030 rev. 19, Appendix A, sec. 5.5 pg. 10.
SL, LP 0702405, EO 7.b; LT 0711405, pgs. 12 - 21.

KAI [3.6/3.3] *
000003A103 ..(KA's)

ANSWER 2.02 (1.00)

b.

REFERENCE

SL, LP0702405, EO 7.a.

KAI [3.6/3.8] *
000003A203 ..(KA's)

ANSWER 2.03 (1.00)

c.

REFERENCE

St Lucie Unit 1, OFF-NORMAL OP, 1-0250030 rev. 6, p. 2.

KAI [4.1/4.4] *
000024K301 ..(KA's)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.04 (1.00)

a.

REFERENCE

St.Lucie Unit 2, 2-EOP-01,Draft 2A,Contingency Actions, Step 5.B.,p.7.
SL, LP 0702023, EO 6, p.15.

KAI [4.1/4.4] *
000055K102 ..(KA's)

ANSWER 2.05 (1.00)

c.

REFERENCE

St. Lucie Unit 2 Technical Specifications, Section 3/4.8.3,
pps. 3/4 8-14 to 3/4 8-16. (attached to exam)
SL, LP 0702504, LO 6; LT 0711503(504), pps. 9 - 15, Figs. 2 & 4.

KAI [3.4/3.7] *
000057G003 ..(KA's)

ANSWER 2.06 (1.00)

c.

REFERENCE

Lesson PLan 0711811, Safety Function Concept, p 16. EO-5 "State example of sucess paths available to accomplish each safety function." 2-EOP-01 Reactivity Control

KAI [4.4/4.6] *
000029G011 ..(KA's)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.07 (1.00)

c.

REFERENCE

St Lucie exam bank validated question 0321

KAI [4.0/4.6] *
000074A206 ..(KA's)

ANSWER 2.08 (1.00)

d.

REFERENCE

St.Lucie Unit 1. 1-EOP-06, Rev 1, CAUTION p 5.

KAI [3.4/4.2] *
00004#F107 ..(KA's)

ANSWER 2.09 (1.00)

b.

REFERENCE

St Lucie ONOP 1-0440030, Appendix G, p 43.

KAI [3.4/3.6] *
000025G008 ..(KA's)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

ANSWER 2.10 (1.00)

d.

REFERENCE

St Lucie ONOP 2-0310031, p 3.

KAI [3.1/3.6] *
000009K301 ..(KA's)

ANSWER 2.11 (1.00)

a.

REFERENCE

St Lucie LP 0702022, p 5; text, p 3. EO 3

KAI [3.7/4.1] *
000007K106 ..(KA's)

ANSWER 2.12 (1.00)

d.

REFERENCE

St Lucie ONOP 1-1210030, p 2; 1-1220030, p 2.

KAI [3.3/3.6] *
000033A202 ..(KA's)

ANSWER 2.13 (1.00)

c.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie ONOP 1-0030136, p 1,3.

KA [3.5/3.9] *
000059A203 ..(KA's)

ANSWER 2.14 (1.00)

a.

REFERENCE

St Lucie ONOP 1-0700030, p 2.

KA1 [4.3/4.4] *
000054A201 ..(KA's)

ANSWER 2.15 (1.00)

c.

REFERENCE

St Lucie ONOP 1-0530030, p 4.

KA1 [3.2/3.9] *
000060G003 ..(KA's)

ANSWER 2.16 (1.00)

c.

REFERENCE

St Lucie ONOP 1-1600030, pp 2,3.

KA1 [3.4/4.1] *
000036A202 ..(KA's)

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

2. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS
(27%)

ANSWER 2.1 (1.00)

b.

REFERENCE

ONOP 1-0030135 p.4

KA [3.9/4.1]
0000038121 ..(KA's)

ANSWER 2.18 (1.00)

c.

REFERENCE

ONOP 2-0250031 p. 4

KA [3.5/3.9]
0000024307 ..(KA's)

ANSWER 2.19 (1.00)

d.

REFERENCE

EOP-1 p.5

KA [4.1/4.3]
0000076011 ..(KA's)

ANSWER 2.20 (1.00)

c.

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

ONOP 2-0120030 p. 4

KA [3.7/4.1]
000002SK300 ..(KA's)

ANSWER 2.21 (1.00)

d.

REFERENCE

St. Lucie Unit 2, OFF-NORMAL OP, 2-0120034 rev. 7, step 3.A.,pg. 4.
SL, LP 0702202, EO 1.,10.,13.; LT 0711202, pgs. 28-29 & 36-37.

KA1 3.7/3.7 *
000015A210 ..(KA's)

ANSWER 2.22 (2.00)

a. 2.
b. 4.
c. 2.
d. 2. [0.5 each]

REFERENCE

St.Lucie Unit 1, OFF-NORMAL OP, 1-0250030 rev. 6, p. 3.
SL, LP 0702205, EO 3.d.;LT 0711205, pp. 27-35, Fig. 24.

KA1 2.7/2.7 *
000024K201 ..(KA's)

ANSWER 2.23 (1.00)

a. 2
b. 2
c. 10
d. 7 [0.25 each]

(***** CATEGORY 2 CONTINUED ON NEXT PAGE *****)

REFERENCE

St Lucie ONOP 1-0120035, Rev 10, p 2.

KA1 3.7/4.1 .*
000027K303 ..(KA's)

ANSWER 2.24 (1.00)

1. lifting of the Main Steam Safeties

2. the leak flow from the RCS. [0.5 each]

REFERENCE

St Lucie LP 0702025, pp 8,10.
EO 7
KA [4.1/4.3] [4.4/4.5] *
000038K301 000038K302 ..(KA's)

ANSWER 2.25 (2.00)

a. 1. 7 inches [0.5]

b. 1) time-dependent long term power distributions. [0.5]

2) available Shutdown Margin. [0.5]

3) ejected CEA worth. [0.5]

REFERENCE

Lesson Plan 07-02405 pg. page 34, EO 12
St.Lucie Unit 2 Technical Specifications, LCO 3.1.3.1 [pg.3/4 1-18]
and BASES 3/4.1.3, para. 4 [pg. B 3/4 1-3].
KA [3.6/4.1]
KA [2.5/3.6]
KA [3.1/3.6] *
000005G004 000005G003 ..(KA's)

(***** END OF CATEGORY 2 *****)

ANSWER 3.01 (1.00)

c. correct answer changed to c.

REFERENCE

CEDS Lesson Text 0711405 p.15
EO 5
KA [3.8/3.8] *
295030K206 001000K402 001000K402 001000K402 ..(KA's)

ANSWER 3.02 (1.00)

c.

REFERENCE

RCP Lesson Text 0711202 p. 35

KA [3.3/3.6] *
003000G010 ..(KA's)

ANSWER 3.03 (1.00)

d.

REFERENCE

RCP Lesson Text p. 30
EO 13
KA [3.0/3.3] *
003000K112 ..(KA's)

ANSWER 3.04 (1.00)

c.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

3. PLANT SYSTEMS (50%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

REFERENCE

ESFAS Lesson Text Figure 16
EO 2
KA [3.9/4.1] *
013000K407 ..(KA s)

ANSWER 3.05 (1.00)

b.

REFERENCE

ESFAS Lesson Text p. 18
EO 2
KA [3.2/4.1] *
013000K407 ..(KA c)

ANSWER 3.06 (1.00)

b.

REFERENCE

Main Feed Lesson Plan 0711301 p. 29; PSL Question bank QNUM 0202
EO 3
KA [3.1/3.3]
059000K416 ..(KA's)

ANSWER 3.07 (1.00)

d.

REFERENCE

ECCS Lesson Text p. 34
EO 2
PSL Question bank QNUM 0670
KA [4.2/4.3] *
006000K103 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.08 (1.00)

a.

REFERENCE

SBCS Lesson Text p. 19
EO 2
PSL Question Bank QNUM 0200
KA [2.5/2.8]* *
041020K414 ..(KA's)

ANSWER 3.09 (1.00)

a.

REFERENCE

NIS Lesson Text p. 18
EO 17
PSL Question Bank QNUM 0345
KA [3.7/3.8]* *
015000K407 ..(KA's)

ANSWER 3.10 (1.00)

a.

REFERENCE

ONOP #1220030 p.3

KA [3.9/4.3]
015000K301 ..(KA's)

ANSWER 3.11 (1.00)

b

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

CCNS Lesson Text p. 4.2-46
EO 2
KA [3.3/3.4] *
000000K102 ..(KA's)

ANSWER 3.12 (1.00)

d.

REFERENCE

RCS Lesson Text pp. 36-37
EO 13
KA [4.4/4.6] *
002020A301 ..(KA's)

ANSWER 3.13 (1.00)

c.

REFERENCE

RPS Lesson Text Fig. 27
EO 3
KA [3.3/3.4] *
012000A402 ..(KA's)

ANSWER 3.14 (1.00)

b.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

ECCS Lesson Text p. 36
EO 12
KA 3.4/3.9
006000K602 ..(KA's)

ANSWER 3.15 (1.00)

d.

REFERENCE

125 vdc Lesson Text p. 4
EO 2
KA 2.9/3.1p
073000K201 ..(KA s)

ANSWER 3.16 (1.00)

c.

REFERENCE

ECCS Lesson Text p. 36
EO 10
KA 3.1/3.1
005000K410 ..(KA s)

ANSWER 3.17 (1.00)

d.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

CVCS Lesson Text p. 24
EO 9
KA [3.7/3.8] *
004010K606 ..(KA's)

ANSWER 3.18 (1.00)

b.

REFERENCE

CVCS Lesson Text p. 24
EO 12
KA [3.7/4.2] *
004000K509 ..(KA's)

ANSWER 3.19 (1.00)

a. Unit 1

b. Both Units

c. Unit 2

d. Neither unit

[.025 ea.]

REFERENCE

Lesson Plan 07-02304 pg. 12 EO 3
Main Steam PSL QNUM 0191
KA [3.1/3.2] *
KA [3.3/3.3] *
KA [3.3/3.6] *
000039K406 039000K101 039000K102 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

3. PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)

ANSWER 3.20 (1.00)

d

REFERENCE

CCWS Lesson Text p. 39
EO 3
KA [3.3/3.1]p *
008000A401 ..(KA's)

ANSWER 3.21 (1.00)

b.

REFERENCE

AFW SD 0711412, pp 11
EO 7
KA [3.1/3.3]
061000K407 ..(KA's)

ANSWER 3.22 (1.00)

a.

REFERENCE

Auxiliary Feed Water Lesson Text p. 12-13
EO 1
KA [3.9/3.9] *
061000A104 ..(KA's)

ANSWER 3.23 (1.00)

a.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

Diesel Generator Lesson Text p. 41-42
EO 17
KA [3.8/4.1] *
064000K401 ..(KA's)

ANSWER 3.24 (1.00)

d.

REFERENCE

Diesel Generator Surveillance Procedure.
EO 13
KA [3.1/3.2] *
064000A405 ..(KA's)

ANSWER 3.25 (1.00)

d.

REFERENCE

Diesel Generator Lesson Text p. 10-11
EO 16
KA [3.6/3.7] *
064000A307 ..(KA's)

ANSWER 3.26 (1.00)

c.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

Main Power Distribution Lesson Text p. 13-14
EO 3
KA [2.7/3.0]
062000K203 ..(KA's)

ANSWER 3.27 (1.00)

d.

REFERENCE

Loss of Instrument Air ONOP #1-1010030 p.5

KA [3.4/3.5]
078000K302 ..(KA's)

ANSWER 3.28 (1.00)

d.

REFERENCE

ECCS Lesson Text p. 44
EO 3
KA [3.8/4.1] *
026020K402 ..(KA's)

ANSWER 3.29 (1.00)

d.

REFERENCE

ECCS Lesson Text p. 43
EO 18
KA [3.5/3.7] *
026000G007 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)

ANSWER 3.30 (1.00)

d.

REFERENCE

Pressurizer Pressure and Level Control Lesson Text p. 21-22
EO 6
KA [3.6/3.4] *
010000G007 ..(KA's)

ANSWER 3.31 (1.00)

d.

REFERENCE

Pressurizer Pressure and Level Control Lesson Text p. 21-22
EO 6
KA [3.6/3.4] *
010000A402 ..(KA's)

ANSWER 3.32 (1.00)

c.

REFERENCE

Pressurizer Pressure and Level Control Lesson Text p. 54
EO 2
KA [3.1/3.3] *
011000A104 ..(KA's)

ANSWER 3.33 (1.00)

b.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

ECCS Lesson Text p. 14
EO 2
KA [3.1/3.3]
005000G004 ..(KA's)

ANSWER 3.34 (1.00)

b.

REFERENCE

ARM Lesson Text p. 13
EO 6
KA [3.3/3.6]
072000K401 ..(KA's)

ANSWER 3.35 (1.00)

a.

REFERENCE

ECCS Lesson Text p. 27
EO 14
KA [4.1/4.3] *
022000A301 ..(KA's)

ANSWER 3.36 (1.00)

a. 4. Amber
b. 2. Green
c. 5. White
d. 1. Red [0.25 ea.]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

CEDS Lesson Text 0/11405 p.28
EO 3
KA [3.5/3.8]
001000K401 ..(KA's)

ANSWER 3.37 (2.25)

a. CIAS [0.25]
SIAS [0.25]
MSIS [0.25]
CSAC [0.25]

→ Answer was added to key, section point and total points increased by 0.25.

b. SIAS [0.25]
CIAS [0.25]
RAS [0.25]
LIAS [0.25]
MSIS [0.25]

REFERENCE

ESFAS OD #0/11401 pp. 15-20
EO 2
KA [4.2/4.4]
013000K101 ..(KA's)

ANSWER 3.38 (1.00)

a

REFERENCE

A Laymans Guide to Radiation Safety p.19

KA [2.8/3.4]
194001K103 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.39 (1.00)

d.

REFERENCE

Admin. Procedure 0010120 p.11

KA [3.4/3.4]
194001A106 ..(KA's)

ANSWER 3.40 (1.00)

a.

REFERENCE

OP 0010122 p. 20

KA [3.7/4.1]
194001K102 ..(KA's)

ANSWER 3.41 (1.00)

a.

REFERENCE

Technical Specification 6.2.2

KA [3.5/4.2]
194001K116 ..(KA's)

ANSWER 3.42 (1.00)

d.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE

Admin Procedure 0010124
EO 1
KA [3.7/4.1]p
194001K102 ..(KA's)

ANSWER 3.43 (1.00)

b.

REFERENCE

AP 1-0010123 p. 4
EO 3c
KA [3.6/4.1]p *
194001K101 ..(KA's)

ANSWER 3.44 (1.00)

b.

REFERENCE

Health Physics Manual, p.15

KA [2.8/3.4]
194001K103 ..(KA's)

ANSWER 3.45 (1.00)

a.

REFERENCE

Health Physics Manual, p. 35

KA [3.3/3.5]
194001K104 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER 3.46 (1.00)

C.

REFERENCE

Admin. Procedure 000.0120 p. 18

KA [2.5/3.4]
1940001A103 ..(KA 5)

ANSWER 3.47 (1.00)

D.

REFERENCE

Admin. Procedure 000.0120, p. 18
5 8
KA [3.1 3.3]
1940001A115 ..(KA 5)

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)