ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION
REACTOR OPERATOR LICENSE EXAMINATION
REGION 4

FACILITY: RIVER BEND STATION

REACTOR TYPE: BWR-GE6

DATE ADMINISTERED: 89/10/17

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Read and follow the NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS attached to your examination. An overall grade of at least 80% is required to pass the examination. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

SITE SPECIFIC WRITTEN EXAMINATION

EXAMINATION POINTS 75.1

CANDIDATE'S SCORE _____

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. Plant Systems # 04, EPE # 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.

23. There is a time limit of (4 1/2) hours for completion of the examination. (or some other time if less than 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: 01 (1.60)

For each plant condition in Column A, MATCH the Emergency Operating Procedure(s) (EOP) in Column B that are required to be entered. Items in Column B may be used more than once or not at all. (NOTE: Each plant condition in Column A may require more than one answer). (1.6)

| COLUMN A | | COLUMN B | |
|---|---|---|---|
| a. | Reactor Vessel Level (-171") | 1. | EOP-1, "RPV Control" |
| b. | Drywell/Containment Differential Pressure (2.00 psid) | 2. | EOP-2, "Primary Containment Control" |
| c. | Containment Pressure (15.0 psia) | 3. | EOP-3, "Secondary Containment and Radioactive Release Control" |
| d. | Main Steamline Tunnel Temperature | 4. | No EOP entry required |

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

QUESTION: 02 (1.50)

For each of the low main condenser actions in Column A, MATCH the ONE (1) associated trip setpoint from Column B. NOTE: trip points from Column B may be used more than once or not at all. (1.5)

| COLUMN A | COLUMN B |
|---|---|
| a. Main Turbine Trip | 1. 7.0" Hg Vac |
| b. Bypass Valve Closure | 2. 8.5" Hg Vac |
| c. MSIV Closure | 3. 10.0" Hg Vac |
| | 4. 13.5" Hg Vac |
| | 5. 17" Hg Vac |
| | 6. 22.3" Hg Vac |
| | 7. 23.2" Hg Vac |
| | 8. 25.0" Hg Vac |

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

QUESTION: 03 (1.00)

In accordance with AOP-0008, "Loss of Instrument Air," SELECT the ONE (1) HIGHEST instrument air pressure that requires a manual reactor scram. (1.0)

a. 45 psig

b. 55 psig

c. 65 psig

d. 75 psig

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

QUESTION: 04 (1.00)

SELECT from the choices below the ONE (1) which correctly completes the following:

Continued high drywell pressure can lead to the requirement to vent the primary containment. The primary containment is vented at 20 psig through the _____ system and discharged to the _____. (1.0)

a. Containment and Drywell Purge, annulus

b. Hydrogen Purge, annulus

c. Containment and Drywell Purge, Off-Gas System

d. Hydrogen Purge, Off-Gas System

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

QUESTION: 05 (1.00)

Emergency Operating Procedures (EOP) have been entered and you are monitoring Reactor Pressure Vessel (RPV) water level on a wide range level indicator. The plant conditions are:

- Drywell has NOT reached RPV saturation
- primary containment radiation is less than 4x10E4 R/hr
- current drywell temperature is 300 deg F
- current containment temperature is 250 deg F
- wide range water level indicated is (-)110"

Using the attached Wide Range Error graph, determine the ACTUAL water level and SELECT from below the answer closest to the ACTUAL water level. (1.0)

a. (-)78"

b. (-)133"

c. (-)142"

d. (-)158"

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

QUESTION: 06 (1.00)

SELECT from the choices below the ONE (1) which correctly completes the following:

An incomplete reactor scram occurs and the reactor remains at a high power. The EOP for "Reactor Power Control," requires a recirculation pump transfer to Low Frequency Motor Generator (LFMG) as opposed to OFF. The reason for transferring to the LFMG prior to tripping the recirculation pumps is to prevent: (1.0)

a. a turbine trip

b. a Group 1 isolation

c. jet pump cavitation

d. inadvertent feedwater pump trip

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

QUESTION: 07 (1.00)

SELECT from the choices below the ONE (1) which correctly completes the following:

A reactor scram occurs from high reactor power and all control rods have not inserted beyond position "02". Tripping the recirculation pumps below the APRM downscale trip setpoint is NOT done because: (1.0)

a. the recirculation pumps are required for mixing should Standby Liquid Control be required.

b. reactor power is very low already and only a small decrease in power would occur.

c. operation of the recirculation pumps ensure the Technical Specifications for vessel bottom load and recirculation loop differential temperature are not exceeded.

d. operation of the recirculation pumps ensures adequate core cooling when the reactor is operated in Shutdown Cooling mode following extended high power operation.

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

QUESTION: 08 (1.00)

Given the list below, SELECT the possible consequence from a HIGH (greater than maximum safe level) suppression pool water level condition. (1.0)

a. Main Control Room primary containment pressure indication may be invalid.

b. Some or all of the suppression pool temperature indications may be invalid.

c. Safety relief valve tail pipe temperatures may be invalid.

d. May defeat the suppression pool horizontal vent function.

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

QUESTION: 09 (2.50)

Column B lists operator and automatic actions regarding the Standby Gas Treatment System (SBGT). Column A lists initiating signals for those actions. MATCH the initiating signal in Column A with the actions in Column B. NOTE: Actions in Column B may be used more than once or not at all. (2.5)

| COLUMN A | COLUMN B |
|---|---|
| a. Hi-Hi Radiation in the Annulus Exhaust | 1. Operator required to align the SBGT with the Containment Atmosphere and Leakage Monitoring System, open fresh air supply dampers and start the SBGT exhaust fans. |
| b. Hi-Hi Radiation in the Auxiliary Building Exhaust | 2. Automatic alignment of the SBGT with the Annulus Mixing System and the Auxiliary Building HVAC exhaust fans, autostart of the Annulus mixing fans and isolation of the Annulus Pressure Control System. |
| c. Low Flow in the Annulus Pressure Control System | 3. Automatic alignment of the Containment/Drywell Ventilation System with SBGT and isolation of the Containment/Drywell Ventilation recirculation loop. |
| d. LOCA isolation signal | 4. Alarm only, operator must align the SBGT with the Auxiliary Building HVAC exhaust only. |
| e. Containment Depressurization after Leak Testing Leak Testing | |

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

QUESTION: 10 (1.00)

The reactor is operating at 70% of rated power. The temperature of the feedwater entering the vessel is in the prohibited area of the "Feedwater Temperature versus Core Power" graph. SELECT from the following the ONE (1) correct Immediate Operator Action required per AOP-0007, "Loss of Feedwater Heating." (1.0)

a. Increase feedwater heater levels.

b. Isolate the extraction steam to feedwater.

c. Reduce reactor power to less than 25% of rated power.

d. Increase reactor power with recirculation flow until reactor power is outside of the prohibited area.

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

QUESTION: 11 (2.50)

The Shift Supervisor has decided to call for an evacuation of the Main Control Room due to fire. STATE the Immediate Operator Actions required prior to evacuation and in accordance with AOP-0031, "Shutdown from Outside Main Control Room." FIVE (5) required. (2.5)

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

QUESTION: 12 (1.00)

A Main Control Room evacuation has occurred in accordance with AOP-0031, "Shutdown Outside Main Control Room." SELECT from the following the location where control room personnel will assemble after evacuating the Main Control Room. (1.0)

a. Emergency Operations Facility

b. Division I Remote Shutdown Panels

c. Division II Remote Shutdown Panels

d. Standby Emergency Remote Shutdown Panels

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

QUESTION: 13 (1.50)

FILL IN THE BLANKS in the statements below concerning operator actions in the event of a reactor scram and in accordance with AOP-001, "Reactor Scram."

a. Verify reactor water level is being restored by the ____1.____ and that the Reactor Recirculation Pumps are ____2.____. (1.0)

b. If fuel failure is suspected, do NOT reset the scram until Radiation Protection surveys the _____ for abnormal radiation levels. (0.5)

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

QUESTION: 14 (2.00)

Due to a Normal Service Water pump low discharge header pressure condition, the Standby Service Water pumps have started. SELECT from the following list SIX (6) components that will be supplied by the Standby Service Water pumps in accordance with AOP-0009, "Loss of Normal Service Water." (2.0)

a. Main Turbine Lube Oil Coolers

b. Control Building Chillers

c. RHR Heat Exchangers

d. Auxiliary Building Unit Coolers

e. Drywell Unit Coolers

f. Radwaste Building Chillers

g. Penetration Valve Leakage Control Compressors

h. Turbine EHC Coolers

i. Fuel Pool Coolers

j. Steam Jet Air Ejectors (SJAE) Intercoolers

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

QUESTION: 15 (1.00)

FILL IN THE BLANKS in the following statements in accordance with AOP-0027, "Fuel Handling Mishaps."

During refueling the refueling cavity/upper containment pool water level is rapidly decreasing. A fuel bundle is now located in an unsafe storage location due to the decreasing water level. To make up the lost water, use _____a._____ or _____b._____ system in accordance with AOP-0027, "Fuel Handling Mishaps." (1.0)

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

QUESTION: 16 (1.00)

A loss of all AC power, including failure of all diesel generators has occurred. FILL IN THE BLANKS in the statement below and in accordance with AOP-0050, "Station Blackout."

Following a loss of all AC power, RPV pressure control will be maintained by _____a._____ or _____b._____. (1.0)

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

QUESTION: 17 (1.00)

STATE the TWO (2) heat sources which are the most likely causes of secondary containment temperatures increasing to their maximum safe operating values. (1.0)

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

QUESTION: 18 (2.00)

Reactor scrams are included as automatic actions which will occur due to a main turbine trip per AOP-0002, "Main Turbine and Generator Trips." For parts "a" and "b" below, SELECT the answer from items 1-4 that will initiate the reactor scram from the stated conditions.

a. The turbine trips from 22% reactor power in Startup Mode. (1.0)

1. main turbine stop valve position
2. reactor steam dome pressure high
3. reactor vessel level
4. APRM

b. The turbine trips from 46% reactor power. (1.0)

1. main turbine stop valve position
2. reactor steam dome pressure high
3. reactor vessel level
4. APRM

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

QUESTION: 19 (1.00)

FILL IN THE BLANKS in the statements below concerning a loss of normal service water in accordance with AOP-0009, "Loss of Normal Service Water."

On a TOTAL loss of normal service water while in Hot Standby mode with bypass valves controlling reactor pressure, a reactor scram is initiated in anticipation of _____a._____ or a loss of _____b._____. (1.0)

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

QUESTION: 20 (2.00)

LIST the TWO (2) general conditions when the At-The-Controls operator will manually initiate a reactor scram. (2.0)

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

QUESTION: 21 (1.00)

Following a reactor scram from high power levels there is an initial RPV level decrease (shrink) followed by an increase (swell). SELECT from the following the ONE (1) correct operator response to the changing RPV level in accordance with GOP-0003, "Scram Recovery." (1.0)

a. Verify the feedwater level control system automatically responds.

b. Verify the main turbine is controlling reactor pressure.

c. Immediately switch the feedwater level control system to single element control.

d. Trip the main feedwater pumps.

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

QUESTION: 22 (1.00)

River Bend Station was operating at 100% power when it was necessary to scram the reactor. Less than 24 hours after the scram the reactor is in startup approaching criticality when a sustained reactor period of 15 seconds is indicated. SELECT from the following statements the ONE (1) CORRECT immediate action for this condition. (1.0)

a. Stop withdrawing control rods and contact a Reactor Engineer.

b. Scram the reactor.

c. Reduce recirculation flow to minimum.

d. Insert control rods until a reactor period of greater than 30 seconds is indicated.

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

QUESTION: 23 (1.00)

River Bend Stations is at 70% reactor power and pressure controller "A" is in control. SELECT the ONE (1) Electro-Hydraulic Control (EHC) System failure that would result in a high reactor pressure transient (i.e. bypass valves and control valves close). ASSUME no other malfunctions exist in the system. (1.0)

a. pressure controller "A" fails high

b. pressure setpoint fails high

c. pressure controller "A" fails low

d. pressure setpoint fails low

(***** END OF CATEGORY 2 *****)

QUESTION: 01 (1.50)

Listed below are trips associated with the recirculation pumps. From this list SELECT the THREE (3) trips that will result in recirculation pump speed changing from HIGH to OFF. (1.5)

a. vessel level low (level 3)

b. CB-2 TRIP pushbutton depressed

c. CB-5 "PUSH TO LOCK" pushbutton depressed

d. discharge valve F067A(B) less than 90% open

e. low frequency motor generator voltage regulator contacts open

f. INCOMPLETE SEQUENCE relay operation

g. turbine stop valve/control valve closure, power greater than 40% (EOC RPT)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 02 (2.00)

ANSWER the following questions concerning the Control Rod and Drive Mechanisms.

a. STATE FOUR (4) possible causes of control rod drift. (1.0)

b. STATE the TWO (2) sources of drive water pressure, in addition to CRD pumps, available to scram the control rods. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 03 (2.00)

Column B lists reactor recirculation flow control responses to changing operating conditions. Column A lists possible changing operating conditions. For each condition in Column A, MATCH the CORRECT response from Column B. (NOTE; each response in Column B can be used more than once, or not at all). (2.0)

| COLUMN A (Condition) | COLUMN B (Flow Control Valve (FCV) Response) |
|---|---|
| a. Reactor water DECREASES to level 4 and LESS than three feedwater pumps are running. | 1. FCV limited to 102% drive flow MAXIMUM |
| b. Reactor water level INCREASES to level 7 and ALL three feedwater pumps are running. | 2. FCV limited to 48% drive flow MINIMUM flow |
| c. Drywell pressure INCREASES to HIGH DRYWELL PRESSURE (1.68 psig). | 3. FCV runback to 60% drive flow |
| d. Hydraulic Power Unit (HPU) failure due to undervoltage condition. | 4. FCV runback to 48% drive flow |
| | 5. FCV motion inhibit |
| | 6. No Response |

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 04 (1.00)

From the choices below SELECT the ONE (1) correct statement concerning the Source Range Monitoring (SRM) System. (1.0)

a. To bypass a failed SRM high voltage power supply, place the SRM drawer mode switch to "BYPASS".

b. Reactor period indication on the SRM system is independent of detector position.

c. Trip status indicators on the local status drawer are bypassed when the reactor mode switch is in "RUN".

d. Attempting to withdraw the SRM detectors with the IRMs in Range 3 or above will result in a rod block.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 05 (1.00)

STATE the actions (FOUR (4) required) which will take place when a Standby Liquid Control System (SLC) keylocked switch is placed to "RUN". (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 06 (1.00)

SELECT which ONE (1) of the following statements correctly identifies the Low Pressure Core Spray (LPCS) System response in the event of a Loss of Coolant Accident (LOCA). (1.0)

a. When a LOCA signal has cleared and the LPCS/RHR DIV 1 INITIATION RESET pushbutton is depressed, the LPCS components automatically secure themselves for subsequent AUTOMATIC operation.

b. Taking manual override control of the LPCS pump will prevent the pump from responding to any further auto start LOCA signals.

c. The difference between an automatic initiation of the LPCS system and a manual pushbutton initiation of the LPCS system is that the automatic initiation starts the LPCS pump after a two second time delay.

d. If a LOCA initiation occurs during a surveillance test of the LPCS system, the suction valves will automatically realign from the RHR "A" suction piping to the suppression pool.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 07 (1.00)

The HPCS discharge line fill pump has failed allowing the HPCS discharge piping to drain. SELECT the ONE (1) statement from below that describes the worst consequence if the HPCS System is initiated under these conditions. (1.0)

a. Insufficient HPCS pump minimum flow.

b. Inability of the HPCS System to meet minimum injection times.

c. Damage to the HPCS piping due to water hammer.

d. Damage to the HPCS pump impeller due to cavitation.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 08 (1.00)

FILL IN THE BLANKS concerning the Reactor Core Isolation Cooling (RCIC) System.

At the condensate storage tank (CST), the RCIC system shares a common suction line with ____a.____ and at the reactor head shares a common discharge line with the ____b.____.

On a RCIC initiation, RCIC turbine speed is controlled first by the ____c.____ and within 30 seconds RCIC turbine speed is controlled by the ____d.____. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 09 (1.00)

SELECT ONE (1) from the following that would cause a RCIC turbine TRIP. (1.0)

a. Main turbine trip after a 15 second time delay.

b. RCIC turbine inlet drain pot isolation valve closure.

c. Reactor pressure at 60 psig.

d. Reactor vessel water level 8.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 10 (1.50)

STATE THREE (3) operator actions which will PREVENT automatic ADS initiation from occurring. (1.5)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 11 (1.00)

The following THREE (3) conditions are satisfied in preparation for ADS initiation.

- High Drywell Pressure (1.68 psig)
- Low Reactor Water Level (Level 3)
- One Low Pressure ECCS Pump Running per Division

STATE the remaining TWO (2) conditions required to enable initiation of ADS. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 12 (1.00)

You are given the following conditions concerning the Electro Hydraulic Control (EHC) system.

- recirculation flow control in loop manual
- normal condenser vacuum
- pressure setpoint at 920 psig
- load limit setpoint at 75%
- bypass jack at 0%
- maximum combined flow limiter at 100%

SELECT from below the ONE (1) correct statement of how the control valve reference signal (CV) and bypass valve flow reference (B/P) will CHANGE if the pressure control unit input from main steam changes FROM 944 psig TO 941 psig. Attached is the River Bend Station EHC System block diagram. (1.0)

a. CV increase and B/P increase

b. CV increase and B/P decrease

c. CV decrease and B/P increase

d. CV decrease and B/P decrease

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 13 (1.00)

SELECT from the choices below the ONE (1) which completes the following sentences.

The Feedwater Level Control System is in "Startup Mode Automatic." On a complete loss of one feedwater flow signal the reactor water will _____. On a failure of the level signal LOW (gross failure) the reactor water level will _____. (1.0)

a. stay the same, increase

b. stay the same, decrease

c. increase, increase

d. increase, decrease

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 14 (1.00)

SELECT from the choices below the ONE (1) which completes the following sentences.

The Feedwater Level Control System is in "Normal Operating Mode Automatic" (three element). On a complete loss of one steam flow signal the reactor water level will _____. On a complete failure of the level signal HIGH (gross failure) the reactor water level will _____. (1.0)

a. increase, increase

b. increase, decrease

c. decrease, increase

d. decrease, decrease

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 15 (1.00)

SELECT from the choices below the ONE (1) which completes the following sentence.

A loss of instrument air pressure to a feedwater regulator valve will cause the valve to _____. (1.0)

a. Fail Open

b. Fail-As-Is

c. Fail Closed

d. Not fail because of accumulator backup.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 16 (2.00)

Column B lists possible fault conditions which if not prevented would damage electrical station equipment. Column A lists automatic trips of the Generator Protection System designed to protect station electrical equipment. MATCH the automatic trip in Column A with the fault condition prevented in Column B. (2.0)

| COLUMN A (Automatic Trip) | COLUMN B (Fault Condition Prevented) |
|---|---|
| a. Generator 230 KV Circuit Breakers (20635 and 20640) trip to prevent: | 1. maintaining system voltage after turbine trip. |
| b. Trip and lockout of the normal 13.8 KV and 4.16 KV supply breakers to prevent: | 2. serious fire by enabling the transformer fire protection interlock. |
| c. Trip and lockout the exciter field breaker to prevent: | 3. turbine overspeed |
| d. Trip the main and normal station service transformer cooling system to prevent: | 4. motoring the main generator |
| | 5. a transformer sudden pressure transient |
| | 6. supplying system power into the original fault. |

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 17 (1.00)

River Bend Station obtains offsite (preferred) AC power from the Fancy Point grid supply at either 500 KV or 230 KV. STATE TWO (2) offsite AC power systems which supply River Bend Station via Fancy Point. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 18 (1.00)

SELECT from the choices below the ONE (1) which completes the following sentence concerning the safety related DC power distribution system.

Where there is an electrical interface between safety related switchgear and non-safety related switchgear, a LOCA signal at the safety related switchgear will remove non-safety related loads by automatic _____. (1.0)

a. reliable vital bus tripping

b. transfer of the swing bus to safety related switchgear

c. drop out of isolation relays

d. breaker tripping

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 19 (1.00)

SELECT from the choices below the ONE (1) which completes the following sentence concerning the safety related DC power distribution system.

Each safety related DC electrical bus is an ungrounded electrical system. The existence of a single ground fault makes the system _____ and the existence of two ground faults (one on each leg) makes the system _____. (1.0)

a. a personnel hazard, inoperable

b. alarm, transfer to standby

c. a fire hazard, transfer to standby

d. division cross-connected, inoperable

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 20 (1.00)

Color coding is used to uniquely identify each division of the safety related DC distribution system. SELECT from Column B the color coding that is assigned to the DC Distribution Division in Column A. (1.0)

| COLUMN A | COLUMN B |
|---|---|
| a. Division I | 1. Red |
| b. Division II | 2. Orange |
| c. Division III | 3. Yellow |
| | 4. Green |
| | 5. Blue |
| | 6. Violet |

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 21 (1.00)

River Bend Station is operating at 100% power when there is a High-High radiation alarm condition sensed from the Control Building local outside air intake. SELECT the ONE (1) statement that correctly describes the control room HVAC response to the High-High radiation condition. (1.0)

a. The Main Control Room smoke removal damper opens and the control room smoke removal fans start.

b. The dampers from the local outside air intake to the standby charcoal filters close to isolate the main control room and the recirculation dampers open to the charcoal filter units.

c. The dampers from the local outside air intake open to allow the control room HVAC system to treat all incoming fresh air with the charcoal filter units.

d. The Control Building spare booster fan is isolated to prevent operation with the isolation dampers closed.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 22 (1.00)

WHICH ONE (1) of the following would be indicative of a loss fo air to the on-line Control Rod Drive (CRD) flow control valve? (1.0)

a. CRD cooling water high differential pressure.

b. CRD high temperature

c. HCU accumulator low pressure

d. low charging water pressure

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 23 (1.50)

The Rod Control and Information System (RC&IS) consists of four subsystems listed under Column B. SELECT from Column B the RC&IS subsystem that performs the purpose/function listed in Column A. (NOTE: Items in Column B may be used more than once or not at all). (1.5)

| COLUMN A (Purpose/Function) | COLUMN B (RC&IS Subsystem) |
|---|---|
| a. Senses for rod drift | 1. Rod Interface System (RIS) |
| b. Provides for normal rod selection for withdraw/insert commands. | 2. Rod Gang Drive System (RGDS) |
| c. A single failed rod drive may be bypassed entirely within this subsystem. | 3. Rod Action Control System (RACS) |
| | 4. Rod Position Information System (RPIS) |

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 24 (1.00)

SELECT which ONE (1) of the following statements about the Reactor Water Cleanup (RWCU) System could cause an inadvertent reduction in reactor vessel water level during reactor startup. (1.0)

a. Failure to properly vent the RWCU system.

b. Closing the RWCU system bypass valve (F042) while on reactor vessel water reject flow.

c. Removing a filter/demineralizer from service with the filter/demineralizer bypass valve open.

d. Loss of instrument air to the RWCU reject flow control valve (F033).

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 25 (1.00)

FILL IN THE BLANKS in the following concerning Main Steam Isolation Valves (MSIVs):

On an automatic closure of the MSIVs, the valves are adjusted so that they close in greater than _____a._____ but less than ____ _b._____. (1.0)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 26 (2.50)

ANSWER the following questions concerning the Main Steam Safety/Relief Valves (SRV).

a. Main Steam Safety/Relief Valves (SRVs) perform their pressure relief function at designated pressures. STATE the THREE (3) SRV RELIEF pressures. (1.0)

b. The Main Steam Safety/Relief Valve (SRV) lift and reset pressures change when the Low-Low-Set logic is initiated. STATE the SRV LIFT pressures with the Low-Low-Set point logic sealed in. THREE (3) LIFT pressures required. (1.0)

c. The purpose of the Low-Low-Set relief logic is to minimize cyclic stress on the _____ following a reactor isolation. (0.5)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 27 (1.00)

The plant is ready to refuel, mode switch in REFUEL, and all rods are in. SELECT ONE (1) from the following that would result in a rod block. NOTE: unless stated differently, assume all hoists and grapples are unloaded for each condition. (1.0)

a. The refueling platform is positioned over the reactor core.

b. The refuel platform is positioned away from the reactor core and the cask transfer crane is loaded.

c. The refuel platform is positioned away from the reactor core and the service platform hoist is loaded.

d. The refuel platform is positioned away from the reactor core and the refueling trolley-mounted hoist is loaded.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 28 (1.00)

River Bend Station is operating with both recirculation pumps at 65% reactor power. SELECT from the following the ONE (1) effect that a loss or shutdown of a single recirculation pump can have on the reactor recirculation system. (1.0)

a. Excessive jet pump vibration in the idle loop and jet pump cavitation in the operating loop.

b. Jet pump cavitation in the idle loop and excessive jet pump vibration in the operating loop.

c. Flow control valve cavitation and excessive recirculation pump vibration in the operating loop.

d. Recirculation pump cavitation and excessive flow control valve vibration in the operating loop.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 29 (1.00)

A reactor scram has occurred and the plant is now in the following condition:

- RPV pressure = 0 psig
- reactor power = decay heat only
- feedwater pumps off
- MSIVs open
- condenser vacuum = 24" Hg

SELECT from the following the ONE (1) possible consequence of allowing the plant to remain in this condition. (1.0)

a. Low reactor vessel water level due to excessive steam carry-over.

b. Actual reactor vessel water level LESS than indicated due to reference leg flashing.

c. Actual reactor vessel water level GREATER than indicated due to reactor vessel water boiling.

d. HIGH reactor vessel water level due to excessive steam carry-under.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 30 (1.00)

From the following list of normal diesel generator protective trips, SELECT the TWO (2) protective trips which are functional following an Emergency start of the diesel generator. (1.0,

a. low-low lube oil pressure

b. high bearing temperature

c. high engine vibration

d. diesel overspeed

e. high turbocharger vibration

f. generator loss of field

g. generator differential

h. reverse power

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 31 (1.00)

SELECT from the choices below the ONE (1) which correctly completes the following statement in accordance with EIP-2-012, "Radiation Exposure Controls."

Authorization to receive radiological exposures in excess of 10CFR20 limits is the responsibility of the _____. (1.0)

a. Emergency Director

b. Radiation Protection Coordinator

c. Radiological Assessment Coordinator

d. Recovery Manager

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 32 (1.00)

FILL IN THE BLANKS in the statements below in accordance with procedure ADM-0027, "Protective Tagging".

a. If, for some reason, a "Numbered" clearance can not be hung within 48 hours, the clearance shall be _____1._____ and the entry in the Tagging Index Sheet shall be ____2._____. (0.5)

b. A clearance becomes valid when _____ signs the "Check and Accepted By" block on the clearance form. (0.25)

c. Supplementary Clearances can NOT be used during _____. (0.25)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 33 (1.50)

MATCH the quarterly exposure limit listed under COLUMN B with the area of the body exposed under COLUMN A in accordance with procedure RSP-0203, "Personnel Monitoring,". Note: Exposure limits listed under COLUMN B may match with more than one item listed under COLUMN A. (1.5)

| | COLUMN A<br>Areas of the Body Exposed | COLUMN B<br>Quarterly Exposure Limit (REM) |
|---|---|---|
| a. | Whole Body | 1. 1.25 |
| b. | Skin of Whole Body | 2. 5.0 |
| c. | Feet and Ankles | 3. 7.5 |
| d. | Active Blood Forming Organs | 4. 18.75 |
| e. | Lens of Eyes | |
| | Hands and Forearms | |

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 34 (1.00)

a. STATE the THREE (3) personnel protective equipment items required when racking in or out electrical breakers of 4160 volts or above. (0.75)

b. STATE the ONE (1) personnel protective equipment item required when racking in or out 480 volt load center breakers. (0.25)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 35 (1.00)

During the performance of a Surveillance Test Procedure (STP), an indicator which should be lit is not due to maintenance on its power supply. "Verifying the indicator lit" is not required to satisfy the STP acceptance criteria. SELECT from the following the ONE (1) correct action in accordance with ADM-0015, "Station Surveillance Test Program" necessary to continue the STP. (1.0)

a. Notify the Shift Supervisor/Control Operating Foreman and obtain his/her approval to continue.

b. Complete an "Exception Report," attach it to the STP and continue.

c. Treat the step as a "Test Exception," provide a justifying comment on the Data Package Cover Sheet and continue.

d. Complete a "Temporary Change Notice" and continue once necessary TCN approvals are obtained.

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 36 (1.00)

SELECT from the choices given the ONE (1) that correctly completes the following statement.

The flux noise region is defined as greater than the _____ rod line and less than _____ percent core flow. (1.0)

a. 75%, 30%

b. 75%, 45%

c. 80%, 30%

d. 80%, 45%

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

QUESTION: 37 (2.00)

FILL IN THE BLANKS below concerning RBS facility fire safety according to ADM-002, "Conduct of Operations:"

a. A fire brigade of at least _____ member(s) shall be maintained on site at all times. (0.5)

b. Members of the fire brigade shall be designated each shift in the _____ log book. (0.5)

c. The ___1.___ will ensure a fully manned fire brigade is present on each shift and the ___2.___ will act as fire brigade leader. (1.0)

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)

ANSWER: 01 (1.60)

a. 1, 2

b. 1, 2

c. 4

d. 3

[+0.40] each lettered response

REFERENCE:

1. River Bend: EOP-1, "RPV Control."
2. River Bend: EOP-2, "Primary Containment Control."
3. River Bend: EOP-3, "Secondary Containment and Radioactive Release Control."
4. KA Numbers 295031G011 (4.3), 295010G011 (4.2), 295032G011 (4.1)

295032G011 295010G011 295031G011 ..(KA's)

ANSWER: 02 (1.50)

a. 6

b. 1

c. 2

[+0.5] each

REFERENCE:

1. River Bend: AOP-0005, p. 2, Automatic Actions.
2. KA Numbers 295002K202 (3.1), 295002K204 (3.2), and 295002K203 (3.5).

295002K203 295002K204 295002K202 ..(KA's)

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

ANSWER: 03 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: AOP-0008, p. 2, Immediate Operator Actions.
2. KA Numbers 295019G010 (3.7).

295019G010 ..(KA's)

ANSWER: 04 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: EOP Basis, EOP-2, Step 11, 12, 13 and 14.
2. River Bend: LOTM-45-2, p. 2.
3. KA Numbers 295024K303 (3.6).

295024K303 ..(KA's)

ANSWER: 05 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: EOP-001, Enclosure -1, pp. 4 and 5.
2. KA Numbers 295031A201 (4.6).

295031A201 ..(KA's)

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

ANSWER: 06 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: EOP-1A Basis, pp. 88 and 89.
2. KA Numbers 295037K301 (4.1).

295037K301 ..(KA's)

ANSWER: 07 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: EOP-1A Basis, pp. 88 and 89.
2. KA Numbers 295006K306 (3.2).

295006K306 ..(KA's)

ANSWER: 08 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: EOP Caution #4, #8, and #9.
2. River Bend: EOP-1, step 9, p. 44.
3. River Bend: EOP-2, step 32.
4. River Bend: LOTM-45-2, p. 3-4.
5. KA Numbers 295029K101 (3.4).

295029K101 ..(KA's)

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

ANSWER: 09 (2.50)

a. 2

b. 4

c. 2

d. 2

e. 1

[+0.5] each; max. [+2.5]

REFERENCE:

1. River Bend: LOTM-64-2, p. 20 (Table 1).
2. KA Numbers 295033K204 (3.9).

295033K204 ..(KA's)

ANSWER: 10 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: AOP-007-4, p. 2.
2. KA Numbers 295014K106 (3.8).

295014K106 ..(KA's)

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

ANSWER: 11 (2.50)

1. Arm and depress all four manual scram pushbuttons.
2. Place the reactor mode switch in SHUTDOWN.
3. Verify all control rods are full in.
4. Initiate HPCS.
5. Initiate LPCS.
6. Initiate RCIC.
7. Close the MSIVs.

Any five (5) [+0.5] each

REFERENCE:

1. River Bend: AOP-0031-6, p. 5.
2. KA Numbers 295016G010 (3.8).

295016G010 ..(KA's)

ANSWER: 12 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: AOP-0031-6, p. 5.
2. KA Numbers 295016G010 (3.8).

295016G010 ..(KA's)

ANSWER: 13 (1.50)

a. 1. Feedwater System [+0.5]
   2. running (on LFMG) [+0.5]

b. Scram Discharge Volume [+0.5]

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

REFERENCE:

1. River Bend: AOP-0001-5, pp. 3 and 4.
2. KA Numbers 295006K202 (3.8).

295006K202 ..(KA's)

ANSWER: 14 (2.00)

b., c., d., e., g., and i.

[+0.33] each; max. [+2.0]

REFERENCE:

1. River Bend: AOP-0009-4, pp. 2 and 3.
2. KA Numbers 295018K201 (3.3).

295018K201 ..(KA's)

ANSWER: 15 (1.00)

a. Condensate System (injection via feedwater lines)
b. HPCS injection
c. Standby Service Water (via RHR-B or via FPC Heat Exchangers)

Any two (2) [+0.5] each; max [+1.0]

REFERENCE:

1. River Bend: AOP-0027-5, p. 3.
2. KA Numbers 295023A202 (3.4).

295023A202 ..(KA's)

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

ANSWER: 16 (1.00)

a. Safety Relief Valves
b. Reactor Core Isolation Cooling (RCIC)

[+0.5] each; any order

REFERENCE:

1. River Bend: AOP-0050-2, p. 2.
2. KA Numbers 295003G010 (3.9).

295003G010 ..(KA's)

ANSWER: 17 (1.00)

1. primary system (boundary) break [+0.5] (Note: Okay to consider/ accept other answers such as; valve packing leak, pipe rupture, RCIC, RWCU.)
2. fire [+0.5]

REFERENCE:

1. River Bend: EOP-3, "Operator Actions," pp. 187 and 188.
2. KA Numbers 295032A203 (3.8).

295032A203 ..(KA's)

ANSWER: 18 (2.00)

a. 4 [+1.0]

b. 1 [+1.0]

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

REFERENCE:

1. River Bend: AOP-0002, "Main Turbine and Generator Trips," Rev. 4, pp. 2 and 3.
2. River Bend: LOTM-15-2, Table 1.
3. KA Numbers 295005K301 (3.8).

295005K301 ..(KA's)

ANSWER: 19 (1.00)

a. turbine trip [+0.5]
b. bypass valves (EHC coolers) [+0.5]

REFERENCE:

1. River Bend: AOP-0009-4, para. 1.2.
2. KA Numbers 295018K101 (3.1)

295018K101 ..(KA's)

ANSWER: 20 (2.00)

1. A scram setpoint is exceeded and an automatic scram did not occur. [+1.0]

2. Plant conditions are approaching an unsafe condition and a manual reactor scram will mitigate the consequences of this condition. [+1.0]

REFERENCE:

1. River Bend: AOP-0001, "Reactor Scram, Rev. 5, p. 2.
2. KA Numbers 295005G011 (4.3).

295006G011 ..(KA's)

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

ANSWER: 21 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: GOP-0003-5, para. 3.0.
2. KA Numbers 295008A101 (3.7).

295008A101 ..(KA's)

ANSWER: 22 (1.00)

d. [+1.0]

REFERENCE:

1. River Bend: LOTM-6-2, p. 32 and GOP-001, Rev. 10, p. 3.
2. KA Numbers 295014G010 (4.0).

295014G010 ..(KA's)

ANSWER: 23 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: LOTM-27, p. 8.
2. KA Numbers 295025K208 (3.7).

295025K208 ..(KA's)

(***** END OF CATEGORY 2 *****)

ANSWER: 01 (1.50)

c. [+0.5]
d. [+0.5]
f. [+0.3]

REFERENCE:

1. River Bend: LOTM-7-3, p. 25.
2. KA Numbers 202002K402 (3.0) and 202001K112 (3.6).

202001K112 202002K402 ..(KA's)

ANSWER: 02 (2.00)

a. 1. excessive cooling water pressure/flow
2. scram inlet valve leaking
3. scram outlet valve leaking
4. rod drift test in progress
5. directional control valve (122) failure
6. stuck collett piston
7. loss of instrument air

Any four (4) [+0.25] each

b. 1. reactor pressure [+0.5]
2. accumulator [+0.5]

REFERENCE:

1. River Bend: ARP-680-07 (Vol 18 tab N, p. 10) LOTM-4-2, p. 16.
2. River Bend: LOTM-4-2, p. 17.
3. KA Numbers 201002G004 (3.6) and 201001G013 (3.6).

201002G004 201001G013 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 03 (2.00)

a. 3
b. 6
c. 5
d. 5

[+0.5] each

REFERENCE:

1. River Bend: LOTM-8-3, Fig. 5; pp. 12, 14.V.B, 14.V.C., 16.
2. River Bend: LOTM-8-2, p. 11.
3. River Bend: LOTM-3-2, p. 5.
4. KA Numbers 202002A301 (3.6).

202002A301 ..(KA's)

ANSWER: 04 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: LOTM-9-2, pp. 1.I.B, 8, 15, 16, and 21 (Table 2).
2. KA Numbers 215004A401 (3.9).

215004A401 ..(KA's)

ANSWER: 05 (1.00)

1. squib valve fires
2. pump suction valve opens
3. Reactor Water Cleanup System (RWCS) isolation
4. pump starts

[+0.25] each

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-16-2, pp 2 and 6.
2. KA Numbers 211000K408 (4.2).

211000K408 ..(KA's)

ANSWER: 06 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: LOTM-17-2, pp. 1, 3, 5, and 6.
2. KA Numbers 209001G014 (3.8).

209001G014 ..(KA's)

ANSWER: 07 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: LOTM-18-2, pp. 2, 3, 6, and 22 (alarm 2344 caution).
2. KA Numbers 209002K103 (3.0).

209002K103 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 08 (1.00)

a. HPCS
b. RHR (head spray or head vent)
c. ramp generator (signal)
d. flow controller

[+0.25] each

REFERENCE:

1. River Bend: LOTM-20-3, p. 14 (Fig. 11).
2. River Bend: LOTM-20-2, pp. 6 (Fig 5), 8, and 11.
3. KA Numbers 217000K101 (3.5) 217000K102 (3.5) 217000A302 (3.6)

217000K302 217000K102 217000K101 ..(KA's)

ANSWER: 09 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: LOTM-20-3, p. 14 (Fig. 11).
2. River Bend: LOTM-20-2, pp. 6 (Fig. 5), 8, and 11.
3. KA Numbers 217000A202 (3.8).

217000A202 ..(KA's)

ANSWER: 10 (1.50)

1. Stop all low pressure ECCS pumps. [+0.5]

2. Depress the timer reset pushbutton prior to the end of the (105 second) time delay. [+0.5]

3. Operate the ADS MANUAL INHIBIT keylock switches to INHIBIT. [+0.5]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-21-2, pp. 2, 3, 4, and 5.C.1.
2. KA Numbers 218000K501 (3.8).

218000K501 ..(KA's)

ANSWER: 11 (1.00)

1. Low Reactor Water Level - Level 1
2. Time Delay (105 seconds)

[+0.5] each

REFERENCE:

1. River Bend: LOTM-21-2, p. 2-3.
2. KA Numbers 218000A402 (4.2).

218000A402 ..(KA's)

ANSWER: 12 (1.00)

d. [+1.0]

REFERENCE:

1. River Bend: LOTM-27-2, p. 27 (Fig SD-113-16).
2. KA Numbers 241000K401 (3.8).

241000K401 ..(KA's)

ANSWER: 13 (1.00)

a. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-34-2, Section V, p. 13.V.A.
2. KA Numbers 259002K605 (3.5) 259002K604 (3.1).

259002K604 259002K605 ..(KA's)

ANSWER: 14 (1.00)

d. [+1.0]

REFERENCE:

1. River Bend: LOTM-34-2, Section V, p. 13.V.A.
2. KA Numbers 250992K605 (3.5) 259002K603 (3.1).

259002K603 259002K605 ..(KA's)

ANSWER: 15 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: LOTM-34-2, Section V, p. 13.V.A.
2. KA Numbers 259002K601 (3.1).

259002K601 ..(KA's)

ANSWER: 16 (2.00)

a. 4
b. 6
c. 1
d. 2

[+0.5] each

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-53-2, pp. 4 through 7, Section III.
2. KA Numbers 245000K301 (3.4) 245000K409 (3.1) 245000K606 (3.0) 245000A301 (3.6).

245000K301 245000A301 245000K606 245000K409 ..(KA's)

ANSWER: 17 (1.00)

1. McKnight 500 KV
2. Big Cajun (CEPCO) 500 KV
3. Port Hudson 230 KV
4. Enjay 230 KV
5. Big Cajun (CEPCO) 230 KV

Any two (2) [+0.5] each; max. [+1.0]

REFERENCE:

1. River Bend: LOTM-56-2, Section B.1, p. 2 (Fig. 1, 2, and 8).
2. KA Numbers 262001K201 (3.3).

262001K201 ..(KA's)

ANSWER: 18 (1.00)

d. [+1.0]

REFERENCE:

1. River Bend: LOTM-57-2, p. 2.
2. KA Numbers 263000K402 (3.1).

263000K402 ..(KA's)

ANSWER: 19 (1.00)

a. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-57-2, p. 2.
2. KA Numbers 263000K402 (3.1) 263000A401 (3.0).

263000A401 263000K402 ..(KA's)

ANSWER: 20 (1.00)

a. 1

b. 5

c. 2

[+0.33] each

REFERENCE:

1. River Bend: LOTM-57, p. 10
2. KA Numbers 263000G004 (3.4).

263000G004 ..(KA's)

ANSWER: 21 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: LOTM-61-2, Section 2, p. 11, 12, 13, and 14.
2. KA Numbers 290003K101 (3.4) 293003K401 (3.1).

290003K401 290003K101 ..(KA's)

ANSWER: 22 (1.00)

b. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM-5-2, CRDH Figure.
2. KA 201003A206 (3.0).

201003A206 ..(KA's)

ANSWER: 23 (1.50)

a. 3
b. 1
c. 2

[+0.5] each; max. [+1.5]

REFERENCE:

1. River Bend: LOTM-6-2, pp. 3.C.1, 4.II.A.4, 11.F, 15.3, 3.C.2, and 2.
2. KA Numbers 214000G007 (3.5).

214000G007 ..(KA's)

ANSWER: 24 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: SOP-0090, para. 4.12.
2. KA Numbers 204000K302 (3.1).

204000K302 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 25 (1.00)

a. 3 seconds [+0.5]
b. 5 seconds [+0.5]

REFERENCE:

1. River Bend: LOTM-24-2, p. 7.E.
2. KA Numbers 239001K401 (3.8).

239001K401 ..(KA's)

ANSWER: 26 (2.50)

a. 1. 1103 psig
2. 1113 psig
3. 1123 psig

[+0.33] each; max [+1.0]

b. Lift
1. 1033 psig
2. 1073 psig
3. 1113 psig

[+0.33] each; max. [+1.0]

c. containment [+0.5]

NOTE: All setpoints are + or - 15 psig

REFERENCE:

1. River Bend: LOTM-24-2, pp. 5 and 26 (Table 1).
2. KA Numbers 239001K407 (3.7) 239001K610 (3.6).

239001K610 239001K407 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 27 (1.00)

c. [+1.0]

REFERENCE:

1. River Bend: LOTM-70-2, Table 3.
2. KA Numbers 234000A302 (3.1).

234000A302 ..(KA's)

ANSWER: 28 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: LOTM-7-3, p. 21.
2. KA Numbers 290002K603 (3.1).

290002K603 ..(KA's)

ANSWER: 29 (1.00)

b. [+1.0]

REFERENCE:

1. River Bend: GOP-0003, Rev. 5, p. 9 of 11.
2. River Bend: LOTM-3-3, Fig. 5D-051-4.
3. KA Numbers 216000A207 (3.4).

216000A207 ..(KA's)

ANSWER: 30 (1.00)

d. [+0.5] and g. [+0.5]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: LOTM 58-2, pp. 10 and 11.
2. KA Numbers 264000K402 (4.0).

264000K402 ..(KA's)

ANSWER: 31 (1.00)

a. [+1.0]

REFERENCE:

1. River Bend: EIP-2-012, p. 2.
2. KA Numbers 294001K103 (3.3).

294001K103 ..(KA's)

ANSWER: 32 (1.00)

a. 1. destroyed (voided)
   2. lined out

b. requestor

c. refueling (outages) (RF-2)

[+0.25] each; max. [+1.0]

REFERENCE:

1. River Bend: ADM-0027, "Protective Tagging," pp. 7.1.2.5 (Note), 7.1.6, and 7.2 (Note).
2. KA Numbers 294001K102 (3.9).

294001K102 ..(KA's)

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

ANSWER: 33 (1.50)

a. 1
b. 3
c. 4
d. 1
e. 1
f. 4

[+0.25] each

REFERENCE:

1. River Bend: RSP-0203, Rev. 3, "Personnel Monitoring,", para. 5.2.1.1, .4, and .5.
2. KA Numbers 294001K103 (3.3).

294001K103 ..(KA's)

ANSWER: 34 (1.00)

a. 1. protective flash suit [+0.25]
   2. hood [+0.25]
   3. tested electrical gloves [+0.25]

b. head shield (or face shield) [+0.25]

REFERENCE:

1. River Bend: Standing Order #68, dated July 21, 1989, Rev. 2.
2. KA Numbers 294001K107 (3.3).

294001K107 ..(KA's)

ANSWER: 35 (1.00)

c. [+1.0]

(***** CATEGORY 3 CONTINUED ON NEXT PAGE *****)

REFERENCE:

1. River Bend: ADM-0015, Rev. 13, "Station Surveillance Test Program," p. 13.
2. KA Numbers 294001A102 (4.2)

294001A102 ..(KA's)

ANSWER: 36 (1.00)

d. [+1.0]

REFERENCE:

1. River Bend: Standing Order #67.
2. KA Numbers 294001A108 (3.1).

294001A108 ..(KA's)

ANSWER: 37 (2.00)

a. five (5) [+0.5]

b. control room [+0.5]

c. 1. Shift Supervisor (SS) [+0.5]
   2. Nuclear Control Operator (NCO) [+0.5]

REFERENCE:

1. River Bend: ADM-0022, "Conduct of Operations," para. 4.1, 3.2.4.23, and 3.2.7.9.
2. KA Numbers 294001K116 (3.5).

294001K116 ..(KA's)

(***** END OF CATEGORY 3 *****)
(********** END OF EXAMINATION **********)

| QUESTION | VALUE | REFERENCE |
|---|---|---|
| 01 | 1.60 | 90041 |
| 02 | 1.50 | 90039 |
| 03 | 1.00 | 90040 |
| 04 | 1.00 | 90042 |
| 05 | 1.00 | 90043 |
| 06 | 1.00 | 90044 |
| 07 | 1.00 | 90045 |
| 08 | 1.00 | 90046 |
| 09 | 2.50 | 90047 |
| 10 | 1.00 | 90049 |
| 11 | 2.50 | 90050 |
| 12 | 1.00 | 90051 |
| 13 | 1.50 | 90052 |
| 14 | 2.00 | 90053 |
| 15 | 1.00 | 90054 |
| 16 | 1.00 | 90055 |
| 17 | 1.00 | 90056 |
| 18 | 2.00 | 90057 |
| 19 | 1.00 | 90058 |
| 20 | 2.00 | 90059 |
| 21 | 1.00 | 90060 |
| 22 | 1.00 | 90061 |
| 23 | 1.00 | 90062 |
| | 30.60 | |
| 01 | 1.50 | 90002 |
| 02 | 2.00 | 90003 |
| 03 | 2.00 | 90004 |
| 04 | 1.00 | 90005 |
| 05 | 1.00 | 90006 |
| 06 | 1.00 | 90007 |
| 07 | 1.00 | 90008 |
| 08 | 1.00 | 90009 |
| 09 | 1.00 | 90010 |
| 10 | 1.50 | 90011 |
| 11 | 1.00 | 90012 |
| 12 | 1.00 | 90013 |
| 13 | 1.00 | 90014 |
| 14 | 1.00 | 90015 |
| 15 | 1.00 | 90016 |
| 16 | 2.00 | 90017 |
| 17 | 1.00 | 90018 |
| 18 | 1.00 | 90019 |
| 19 | 1.00 | 90020 |
| 20 | 1.00 | 90021 |
| 21 | 1.00 | 90022 |
| 22 | 1.00 | 90023 |
| 23 | 1.50 | 90024 |
| 24 | 1.00 | 90025 |
| 25 | 1.00 | 90026 |
| 26 | 2.50 | 90028 |
| 27 | 1.00 | 90029 |
| 28 | 1.00 | 90030 |

| QUESTION | VALUE | REFERENCE |
|---|---|---|
| 29 | 1.00 | 90037 |
| 30 | 1.00 | 90038 |
| 31 | 1.00 | 90001 |
| 32 | 1.00 | 90031 |
| 33 | 1.50 | 90032 |
| 34 | 1.00 | 90033 |
| 35 | 1.00 | 90034 |
| 36 | 1.00 | 90035 |
| 37 | 2.00 | 90036 |
| | 44.50 | |
| | 75.10 | |

U. S. NUCLEAR REGULATORY COMMISSION
SENIOR REACTOR OPERATOR LICENSE EXAMINATION
REGION 4

FACILITY: RIVER BEND STATION

REACTOR TYPE: BWR-GE6

DATE ADMINISTERED: 89/10/17

CANDIDATE: _____

INSTRUCTIONS TO CANDIDATE:

Read and follow the NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS attached to your examination. An overall grade of at least 80% is required to pass the examination. Examination papers will be picked up four and one half (4 1/2) hours after the examination starts.

SITE SPECIFIC WRITTEN EXAMINATION

EXAMINATION POINTS 76.0

CANDIDATE'S SCORE _____

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. Plant Systems # 04, EPE # 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.

23. There is a time limit of (4 1/2) hours for completion of the examination. (or some other time if less than 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: 01 (1.00)

SELECT all choices that complete this sentence.

An entry condition for EOP-0002, "Primary Containment Control Emergency Procedure," is:

a. Containment pressure above 14.7 psia.

b. Suppression Pool level not between -0.25 ft. and +0.25 ft.

c. Primary Containment hydrogen concentration above 1.68%.

d. RPV water level 150 inches.

QUESTION: 02 (1.00)

FILL IN THE BLANKS in this statement according to AOP-0027, "Fuel Handling Mishaps."

During refueling the refueling cavity/upper containment pool water level is rapidly decreasing. A fuel bundle is located in an unsafe storage location because of the decreasing water level. To make up the lost water, use the _____a_____ or _____b_____ system in accordance with AOP-0027.

QUESTION: 03 (1.00)

SELECT the choice that completes this statement.

With the reactor at 95 % power, the Operator "At - the - Controls" notices indicated steam flow on B main steam line is decreasing, steam flow on the other three is increasing, and RPV pressure is at 1060 psig increasing. The appropriate action is:

a. rapidly reduce RR flow.

b. initiate a manual scram.

c. reopen valve in line B.

d. increase turbine load to control pressure.

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

QUESTION: 04 (1.00)

SELECT the choice that completes this statement.

If fuel failure is suspected following a scram, the proper action is to:

a. reset the scram as soon as possible to minimize fission product migration past the scram valves.

b. reset the scram as soon as possible to minimize radiation levels and expedite radiation surveys of the SDV.

c. NOT reset the scram until a radiation survey of the SDV to determine if levels are abnormal has been made.

d. NOT reset the scram until radiation levels from shortlived fission products has decayed to near normal.

QUESTION: 05 (2.00)

MATCH the individuals in COLUMN A with the recommended AOP-0031, "Shutdown from Outside the Main Control Room," responsibilities in COLUMN B if an event has occurred at power that requires entering AOP-0031. (Items in COLUMN B may be used more than once.)

| COLUMN A | COLUMN B |
|---|---|
| a. ATC Operator | 1. Fire Brigade Leader; not available to implement AOP-0031. |
| b. Control Building Operator | 2. Implementation of AOP-0031 and EOPs as directed by COF. |
| c. Reactor Building NEO | 3. Fire Brigade member; not available to implement AOP-0031 |
| d. Aux Control Room NEO | |

QUESTION: 06 (2.00)

STATE the FOUR Radiation Monitoring systems or subsystems that provide signals to the Containment and Reactor Vessel Isolation Control (CRVICS) for valve group isolations.

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

QUESTION: 07 (1.00)

SELECT the choice that completes this statement.

A scram signal is received with the reactor at power, but the control rods did not fully insert, reactor power is at 4%, and the main turbine is on line. According to EOP-1A, "Anticipated Transient Without Scram," the initial action is to:

a. transfer the RR pumps to slow speed.

b. trip the RR pumps.

c. inject boron with SLC.

d. initiate ARI.

QUESTION: 08 (1.00)

SELECT the choice that completes this statement.

The Heat Capacity Temperature Limit graph in the EOPs is used to determine:

a. the highest suppression pool temperature at which Boron injection can be safely initiated.

b. the lowest suppression pool water level at which RPV depressurization can safely be initiated.

c. the highest suppression pool temperature at which actuation of ADS can be safely initiated.

d. the lowest suppression pool water level at which ADS inhibit function can be safely initiated.

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

QUESTION: 09 (1.00)

SELECT the choice that completes this statement.

Following an offsite release, the River Bend Emergency Plan Implementing Procedures require that:

a. the Shift Supervisor perform offsite dose calculations initially within 30 min and every 15 min thereafter until relieved by TSC personnel.

b. the Shift Foreman perform offsite dose calculations initially within 30 min and every 15 min thereafter until relieved by TSC personnel.

c. the Shift Supervisor perform offsite dose calculations initially within 15 min and every 30 min thereafter until relieved by TSC personnel.

d. the Shift Foreman perform offsite dose calculations initially within 15 min and every 30 min thereafter until relieved by TSC personnel.

QUESTION: 10 (1.00)

SELECT the choice that completes this statement.

The MSIVs went shut with the reactor at power, the reactor did not shutdown, but core cooling is adequate. In this case, the most severe challenge is to the:

a. fuel integrity

b. RPV integrity

c. containment integrity

d. injection system operability

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

QUESTION: 11 (1.00)

SELECT the choice that completes this statement.

When a station blackout occurs:

a. The reactor will scram as a result of load rejection.

b. The SRVs must be manually operated for RPV pressure control.

c. The RCIC will initiate when RPV level decreases to Level 2.

d. A diesel fire pump must be manually started to maintain fire header pressure.

QUESTION: 12 (1.00)

SELECT the choice that completes this statement.

A parameter change in a decision step with a red border in the EOPs, such that the reverse choice is true, means that you must:

a. reenter at the top of that flow path to verify no other parameters have changed.

b. reenter at that step and proceed through the alternate flow path.

c. reenter at that step and hold until the step can be satisfied.

d. reenter at the previous decision step and verify that you are on the correct flow path.

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

QUESTION: 13 (1.00)

SELECT the choice that completes this statement.

According to EOP-1, "RPV Control," RPV flooding is required if:

a. drywell temperature exceeds 212 degrees F.

b. RPV level cannot be determined.

c. D/P between Drywell and containment > 25 psid.

d. containment pressure >15 psia.

QUESTION: 14 (3.00)

For each set of conditions listed in COLUMN A, identify the applicable EOP(s) from COLUMN B. (Items in COLUMN B may be used more than once.)

| | COLUMN A | COLUMN B |
|---|---|---|
| a. | Reactor water level 12.5"<br>Drywell pressure 1.87 psig<br>Drywell temperature 138 deg F | 1. EOP 1<br>2. EOP 2 |
| b. | Suppression pool level -0.3'<br>RCIC Room sump level 1 foot above top of sump<br>RCIC isolated due to high room temperature | 3. EOP 3<br>4. NONE |
| c. | Reactor pressure 400 psig<br>Reactor water level -45"<br>Suppression pool temperature 92 deg F<br>Containment pressure 0.2 psig | |
| d. | Reactor water level 15"<br>Reactor pressure 810 psig<br>Drywell pressure 1.52 psig<br>Suppression pool level + 0.1' | |

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

QUESTION: 15 (1.00)

SELECT the choice that completes this statement.

A Turbine Electro-hydraulic Control (EHC) system failure that would result in a high pressure transient is:

a. the operating pressure regulator failing high with the non-operating pressure regulator in test.

b. the operating pressure regulator failing low with the non-operating pressure regulator in test.

c. the operating pressure regulator failing low with NO operator action.

d. the operating pressure regulator failing high with NO operator action.

QUESTION: 16 (1.00)

SELECT the choice that completes this statement.

One of the results of a loss of Instrument Air is that:

a. CRD flow control valve fails open

b. Heater drain pumps' recirc valves fail open

c. Scram Discharge Volume vent and drain valves fail open

d. Steam supply to SJAE PCV fails open

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

QUESTION: 17 (2.00)

SELECT the choices that complete these statements.

According to AOP-0002, "Main Turbine and Generator Trips":

a. If the turbine trips from 22% reactor power, a reactor scram will be initiated by:

   1. Main turbine stop valve position.

   2. Turbine control valve position.

   3. Reactor vessel water level.

   4. Average Power Range Monitor.

b. If the turbine trips from 46% reactor power, a reactor scram will be initiated by:

   1. Main turbine stop valve position.

   2. Turbine control valve position.

   3. Reactor vessel water level.

   4. Average Power Range Monitor.

QUESTION: 18 (1.00)

SELECT the choice that completes this statement.

The load that will NOT be affected by a loss of Reactor Plant Component Cooling Water (CCP) is the:

a. Drywell cooler.

b. Drywell equipment drain heat exchanger.

c. RWCU pump seal cooler.

d. RHR pump seal cooler.

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

QUESTION: 19 (1.00)

SELECT the choice that completes this statement.

Following an event that resulted in a reactor scram from full power, these conditions exist:

- RPV water level 52 inches
- Containment to annulus dp 5.5 psid
- RPV Pressure 830 psig
- Containment temperature 187 deg F
- Drywell temperature 333 deg F

EOP-1 directs the Operator to:

a. Inhibit ADS

b. Flood primary containment

c. Flood the RPV

d. Emergency depressurize

QUESTION: 20 (1.00)

SELECT the choice that completes this statement.

High pressure transients in the reactor are more severe at EOC than at BOC because:

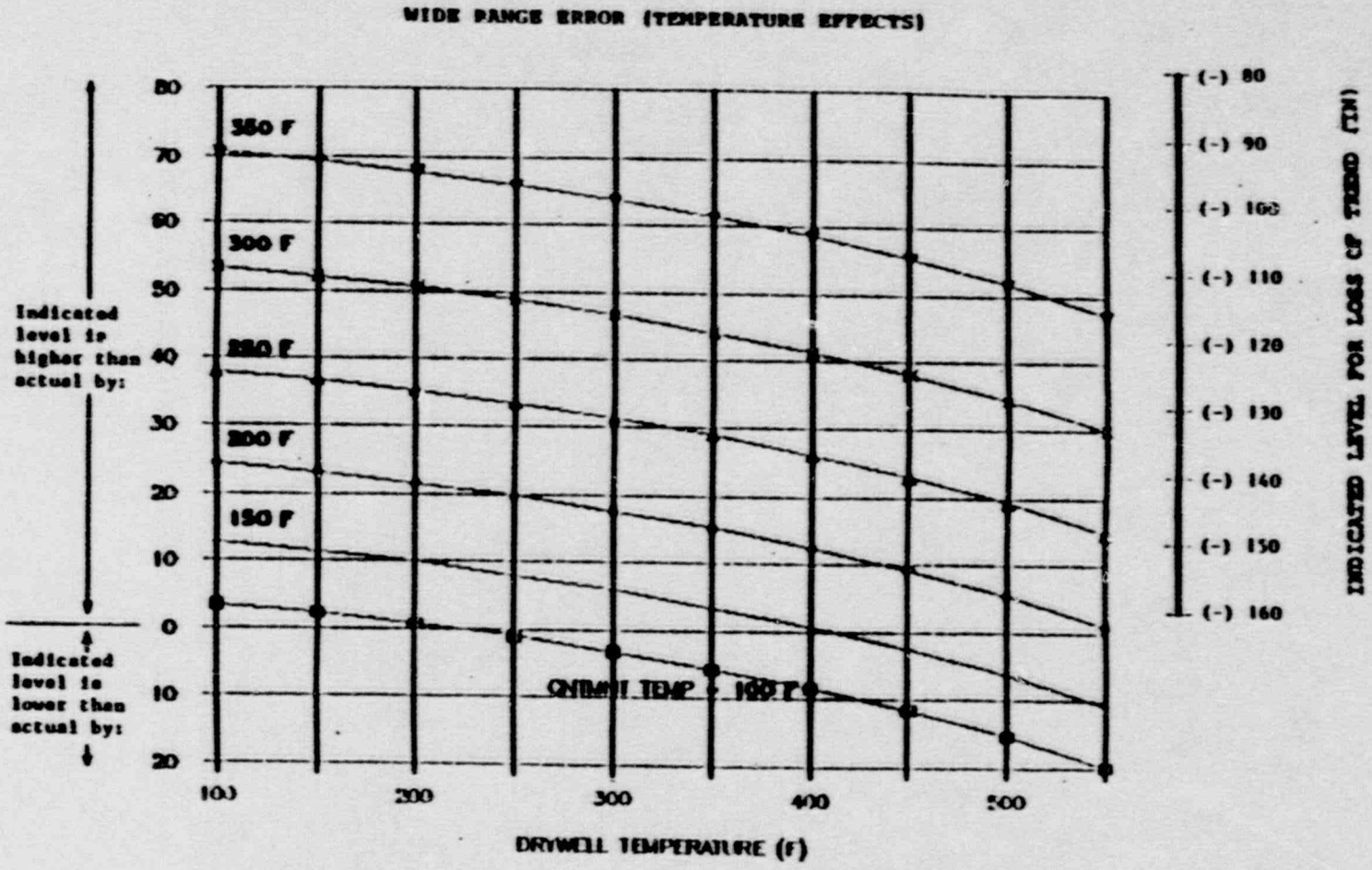
a. there is a faster scram reactivity insertion rate at EOC.

b. the control rods are further withdrawn at EOC.

c. the delayed neutron fraction is smaller at BOC.

d. the reactor period is longer at EOC for the same positive reactivity addition.

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




NOTE: This graph is intended for use only when instrument is not off scale.

QUESTION: 21 (1.00)

SELECT the choice that completes this statement.

The reactor is operating at 100% when one recirculation pump trips due to an electrical fault. An immediate action required by AOP-0024, "Decrease in Recirculation System Flow Rate," is:

a. tripping the second recirculation pump to stabilize power.

b. inserting control rods in the reverse order of the rod sequence.

c. scramming the reactor if peak to peak APRM oscillations > 3%.

d. restarting the tripped pump in fast speed as quickly as possible.

QUESTION: 22 (1.00)

SELECT the choice that completes this statement.

A loaded Instrument Air Compressor tripped due to high discharge air temperature. According to SOP-0022, it can be restarted:

a. immediately to prevent the internals from becoming galled.

b. when the local high temperature trip is manually reset.

c. as soon as cooling water to the hot cylinder is increased.

d. after it has cooled to ambient temperature.

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

QUESTION: 23 (1.00)

SELECT the choice that completes this statement.

A decreasing pressure on the instrument air header has been observed and a Gaitronics announcement to cease non-essential use of air has been made. A reactor scram is required in accordance with AOP-0008, "Loss of Instrument Air," when:

a. the second scram accumulator alarm is observed.

b. instrument air header pressure decreases to 80 psig.

c. condenser vacuum decreases to 26.3" Hg.

d. determined that instrument air cannot be restored.

QUESTION: 24 (2.00)

MATCH the action in COLUMN A with its appropriate vacuum setpoint in COLUMN B. (Items in COLUMN B may be used more than once or not at all.)

| COLUMN A | COLUMN B |
|---|---|
| a. MSIVs close. | 1. 7" Hg |
| b. Main steam bypass valves close. | 2. 8.5" Hg |
| c. Main Turbine trips. | 3. 14.7" Hg |
| d. Reactor Scram. | 4. 22.3" Hg |
| | 5. 25" Hg |
| | 6. No trip point exists. |

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

QUESTION: 25 (1.00)

MATCH the expected action or response in COLUMN A with the Plant Air system pressure settings in COLUMN B. (Items in COLUMN B may be used more than once or not at all.)

| COLUMN A | | COLUMN B |
|---|---|---|
| a. | Standby air compressor starts | 1. 50 psig |
| b. | Deleted | 2. 65 psig |
| c. | Service Air isolation valve (1SAS-AOV101) closes | 3. 80 psig |
| | | 4. 100 psig |
| | | 5. 105 psig |
| | | 6. 110 psig |

QUESTION: 26 (1.00)

SELECT the choice that completes this statement.

Continued high drywell pressure can lead to the requirement to vent the primary containment. The primary containment is vented at 20 psig through the _____ system and discharged to the _____.

a. Containment and Drywell Purge, annulus

b. Hydrogen Purge, annulus

c. Containment and Drywell Purge, Off Gas System

d. Hydrogen Purge, Off Gas System

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

QUESTION: 27 (1.00)

Emergency Operating Procedures (EOP) have been entered and you are monitoring Reactor Pressure Vessel (RPV) water level on a wide range level indicator. The plant conditions are:

- Drywell has NOT reached RPV saturation temperature
- primary containment radiation is less than 4x10E4 R/hr
- current drywell temperature is 300 deg F
- current containment temperature is 250 deg F
- wide range water level indicated is (-)110"

Using the attached Wide Range Error graph, determine the ACTUAL water level and SELECT the answer closest to the ACTUAL water level.

a. -78"

b. -133"

c. -142"

d. -158"

QUESTION: 28 (1.00)

SELECT the choice that completes this statement.

During an incomplete reactor scram, the reactor remains at a high power. The EOP for "Anticipated Transient Without Scram" requires a recirculation pump transfer to the Low Frequency Motor Generator (LFMG). The reason for transferring to the LFMG prior to tripping the pumps is to prevent:

a. a turbine trip

b. a Group 1 isolation

c. jet pump cavitation

d. inadvertent feedwater pump trip

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

QUESTION: 29 (1.00)

SELECT the choice that completes this statement.

A reactor scram occurs from high reactor power and all control rods have not inserted beyond position "02." The recirculation pumps are NOT tripped below the APRM downscale trip setpoint because:

a. the recirculation pumps are required for mixing should Standby Liquid Control be required.

b. reactor power is very low already and only a small decrease in power would occur.

c. operation of the recirculation pumps ensure the Technical Specifications for vessel bottom load and recirculation loop differential temperature are not exceeded.

d. operation of the recirculation pumps ensures adequate core cooling when the reactor is operated in Shutdown Cooling mode following extended high power operation.

QUESTION: 30 (1.00)

SELECT the possible consequence if suppression pool water level is greater than the MAXIMUM safe level.

a. Main Control Room primary containment pressure indication may be invalid.

b. Some or all of the suppression pool temperature indications may be invalid.

c. Safety relief valve tail pipe temperatures may be invalid.

d. May defeat the suppression pool horizontal vent function.

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

QUESTION: 31 (2.50)

MATCH the Standby Gas Treatment System (SBGT) initiating signals in COLUMN A with the required operator and automatic actions in COLUMN B. (Actions in Column B may be used more than once or not at all.)

| COLUMN A | | COLUMN B | |
|---|---|---|---|
| a. | Hi-Hi Radiation in the Annulus Exhaust | 1. | Operator required to align the SBGT with the Containment Atmosphere and Leakage Monitoring System, open fresh air supply dampers and start the SBGT exhaust fans. |
| b. | Hi-Hi Radiation in the Auxiliary Building Exhaust | 2. | Automatic alignment of the SBGT with the Annulus Mixing System and the Auxiliary Building HVAC exhaust fans, auto start of the annulus mixing fans and isolation of the Annulus Pressure Control System. |
| c. | Low Flow in the Annulus Pressure Control System | 3. | Automatic alignment of the Containment/Drywell Ventilation System with SBGT and isolation of the Containment/Drywell Ventilation recirculation loop. |
| d. | LOCA isolation signal | 4. | Alarm only, operator must align the SBGT with the Auxiliary Building HVAC exhaust only. |
| e | Containment Depressurization after Leak Testing | | |

QUESTION: 32 (0.00)

Deleted

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

QUESTION: 33 (1.00)

SELECT the Immediate Operator Action required by AOP-0007, "Loss of Feedwater Heating."

The reactor is operating at 70% of rated power. The temperature of the feedwater entering the vessel is in the prohibited area of the "Feedwater Temperature versus Core Power" graph.

a. Increase feedwater heater levels.

b. Isolate the extraction steam to feedwater.

c. Reduce reactor power to less than 25% of rated power.

d. Increase reactor power with recirculation flow until reactor power is outside of the prohibited area.

QUESTION: 34 (1.00)

FILL IN THE BLANKS in the statement concerning operator actions following a reactor scram according to AOP-0001, "Reactor Scram."

Verify reactor water level is being restored by the ____a____ and that the Reactor Recirculation Pumps are ____b____.

QUESTION: 35 (1.00)

FILL IN THE BLANKS in the statement according to AOP-0050, "Station Blackout," if a loss of all AC power, including failure of all diesel generators has occurred.

Following a loss of all AC power, RPV pressure control will be maintained by _____a_____ or _____b_____.

QUESTION: 36 (1.00)

STATE the TWO heat sources that would be the most likely causes of secondary containment temperatures increasing to their maximum safe operating values as stated in EOP-3, "Secondary Containment and Release Control."

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

QUESTION: 37 (1.00)

SELECT the operator response according to GOP-0003, "Scram Recovery."

Following a reactor scram from a high power level, there is an initial RPV level decrease (shrink) followed by an increase (swell). The operator is directed to:

a. verify the feedwater level control system automatically responds.

b. verify the main turbine is on line controlling reactor pressure.

c. immediately switch the feedwater level control system to single element control.

d. Trip the main feedwater pumps.

QUESTION: 38 (1.00)

SELECT the immediate action for this condition.

The reactor was scramed from 100% power, less than 24 hours later the reactor is in startup approaching criticality when a sustained reactor period of 15 seconds is indicated.

a. Stop withdrawing control rods and contact a Reactor Engineer.

b. Scram the reactor.

c. Reduce recirculation flow to minimum.

d. Insert control rods until a reactor period of greater than 30 seconds is indicated.

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

QUESTION: 01 (2.00)

Provide short responses regarding the Control Rod and Drive Mechanisms.

a. STATE FOUR possible causes of control rod drift. (1.0)

b. STATE the TWO sources of drive water pressure (in addition to CRD pumps) available to scram the control rods. (1.0)

QUESTION: 02 (2.00)

MATCH the changing operating conditions in COLUMN A with the reactor recirculation flow control response from COLUMN B. (Items in Column B may be used more than once or not at all.)

| | COLUMN A | | COLUMN B |
|---|---|---|---|
| a. | Reactor water DECREASES to level 4 and LESS than three feedwater pumps are running. | 1. | FCV limited to 102% drive flow MAXIMUM |
| | | 2. | FCV limited to 48% drive flow MINIMUM |
| b. | Reactor water level INCREASES to level 7 and ALL three feedwater pumps are running. | 3. | FCV runback to 60% drive flow |
| c. | Drywell pressure INCREASES to HIGH DRYWELL PRESSURE trip setpoint. | 4. | FCV runback to 48% drive flow |
| | | 5. | FCV motion inhibit |
| d. | Hydraulic Power Unit (HPU) failure due to undervoltage condition. | 6. | No Response |

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

QUESTION: 03 (1.00)

SELECT the correct statement concerning the Source Range Monitoring (SRM) system.

a. To bypass a failed SRM high voltage power supply, place the SRM drawer mode switch to "BYPASS."

b. Reactor period indication on the SRM system is independent of detector position.

c. Trip status indicators on the local status drawer are bypassed when the reactor mode switch is in "RUN."

d. Attempting to withdraw the SRM detectors with the IRMs in Range 3 or above will result in a rod block.

QUESTION: 04 (1.00)

STATE the FOUR component actuations that occur when a Standby Liquid Control System (SLC) keylocked switch is placed to "RUN."

QUESTION: 05 (1.00)

SELECT the correct Low Pressure Core Spray (LPCS) System response to a Loss of Coolant Accident (LOCA).

a. When a LOCA signal has cleared and the LPCS/RHR DIV 1 INITIATION RESET pushbutton is depressed, the LPCS components automatically secure themselves for subsequent AUTOMATIC operation.

b. Taking manual override control of the LPCS pump will prevent the pump from responding to any further auto start LOCA signals.

c. The difference between an automatic initiation of the LPCS system and a manual pushbutton initiation of the LPCS system is that the automatic initiation starts the LPCS pump after a two second time delay.

d. If a LOCA initiation occurs during a surveillance test of the LPCS system, the suction valves will automatically realign from the RHR "A" suction piping to the suppression pool.

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

QUESTION: 06 (1.00)

SELECT the statement that describes the WORST consequence if the HPCS System is initiated with the HPCS discharge line drained because the fill pump has failed.

a. Insufficient HPCS pump minimum flow.

b. Inability of the HPCS System to meet minimum injection times.

c. Damage to the HPCS piping due to water hammer.

d. Damage to the HPCS pump impeller due to cavitation.

QUESTION: 07 (1.00)

SELECT the condition that will cause a RCIC turbine TRIP.

a. Main turbine trip after a 15 second time delay.

b. RCIC turbine inlet drain pot isolation valve closure.

c. Reactor pressure at 60 psig.

d. Reactor vessel water level 8.

QUESTION: 08 (1.50)

STATE the THREE operator actions that will PREVENT automatic ADS initiation. (Assume ADS valve actuation has not previously occurred.)

QUESTION: 09 (1.00)

These THREE conditions are satisfied in preparation for ADS initiation.

- High Drywell Pressure trip
- Low Reactor Water Level (Level 3)
- One Low Pressure ECCS Pump Running per Division

STATE the remaining TWO conditions required to enable ADS initiation.

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

QUESTION: 10 (1.00)

SELECT the choice that completes these sentences.

The Feedwater Level Control System is in "Startup Mode Automatic." On a complete loss of one feedwater flow signal the reactor water will _____. On a failure of the level signal LOW (gross failure) the reactor water level will _____.

a. stay the same, increase

b. stay the same, decrease

c. increase, increase

d. increase, decrease

QUESTION: 11 (1.00)

STATE TWO offsite AC power sources that can supply River Bend Station via Fancy Point (preferred AC power).

QUESTION: 12 (1.00)

SELECT the choice that completes this sentence.

In the safety related DC power distribution system, where there is an electrical interface between safety related switchgear and non-safety related switchgear, a LOCA signal at the safety related switchgear will remove non-safety related loads by automatic:

a. reliable vital bus tripping

b. transfer of the swing bus to safety related switchgear

c. drop out of isolation relays

d. breaker tripping

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

QUESTION: 13 (1.00)

SELECT the choice that completes this sentence.

Each safety related DC electrical bus is an ungrounded electrical system. The existence of a single ground fault makes the system _____ and the existence of two ground faults (one on each leg) makes the system _____.

a. a personnel hazard, inoperable

b. alarm, transfer to standby

c. a fire hazard, transfer to standby

d. division cross-connected, inoperable

QUESTION: 14 (1.00)

MATCH the color coding that is assigned to the DC Distribution Division in COLUMN A with the correct color from COLUMN B.

| | COLUMN A | COLUMN B |
|---|---|---|
| a. | Division I | 1. Red |
| b. | Division II | 2. Orange |
| c. | Division III | 3. Yellow |
| | | 4. Green |
| | | 5. Blue |
| | | 6. Violet |

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

QUESTION: 15 (1.00)

SELECT the statement that describes the control room HVAC response to a High-High radiation on the Control Building local outside air intake if the reactor is operating at 100% power.

a. The Main Control Room smoke removal damper opens and the control room smoke removal fans start.

b. The dampers from the local outside air intake to the standby charcoal filters close to isolate the main control room and the recirculation dampers open to the charcoal filter units.

c. The dampers from the local outside air intake open to allow the control room HVAC system to treat all incoming fresh air with the charcoal filter units.

d. The Control Building spare booster fan is isolated to prevent operation with the isolation dampers closed.

QUESTION: 16 (1.50)

MATCH the Rod Control and Information System (RC&IS) function or purpose in COLUMN A with the RC&IS subsystem that performs that purpose or function from COLUMN B. (Items in Column B may be used more than once or not at all).

| COLUMN A | COLUMN B |
|---|---|
| a. Senses for rod drift | 1. Rod Interface System (RIS) |
| b. Deleted | 2. Rod Gang Drive System (RGDS) |
| c. Provides for normal rod selection for withdraw/insert commands. | 3. Rod Action Control System (RACS) |
| d. A single failed rod drive may be bypassed entirely within this subsystem. | 4. Rod Position Information System (RPIS) |

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

QUESTION: 17 (1.00)

SELECT the statement about the Reactor Water Cleanup (RWCU) system action or non-action that could cause an inadvertent reduction in reactor vessel water level during reactor startup.

a. Failure to properly vent the RWCU system.

b. Closing the RWCU system bypass valve (F042) while a reactor vessel water reject flow.

c. Removing a filter/demineralizer from service with the filter/demineralizer bypass valve open.

d. Loss of instrument air to the RWCU reject flow control valve (F033).

QUESTION: 18 (1.00)

FILL IN THE BLANKS with the correct time:

Main Steam Isolation Valves are adjusted to close in greater than ___a___ but less than ___b___ on automatic closure.

QUESTION: 19 (1.00)

SELECT the condition that will result in a rod block with the plant ready to refuel, mode switch in REFUEL, and all rods in. (NOTE: Unless stated differently, assume all hoists and grapples are unloaded for each condition.)

a. The refueling platform is positioned over the reactor core.

b. The refuel platform is positioned away from the reactor core and the cask transfer crane is loaded.

c. The refuel platform is positioned away from the reactor core and the service platform hoist is loaded.

d. The refuel platform is positioned away from the reactor core and the refueling trolley-mounted hoist is loaded.

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

QUESTION: 20 (1.00)

SELECT the effect that loss or shutdown of a single recirculation pump can have on the reactor recirculation system during normal operation at 65% reactor power.

a. Excessive jet pump vibration in the idle loop and jet pump cavitation in the operating loop.

b. Jet pump cavitation in the idle loop and excessive jet pump vibration in the operating loop.

c. Flow control valve cavitation and excessive recirculation pump vibration in the operating loop.

d. Excessive flow control valve vibration and recirculation pump cavitation in the operating loop.

QUESTION: 21 (1.00)

SELECT the choice that completes the statement according to EIP-2-012, "Radiation Exposure Controls."

Authorization to receive radiological exposures in excess of 10CFR20 limits is the responsibility of the:

a. Emergency Director

b. Radiation Protection Coordinator

c. Radiological Assessment Coordinator

d. Recovery Manager

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

QUESTION: 22 (1.00)

FILL IN THE BLANKS in these statements according to procedure ADM-0027, "Protective Tagging."

a. If, for some reason, a "Numbered" clearance can not be hung within 48 hours, the clearance shall be _____1_____ and the entry in the Tagging Index Sheet shall be _____2_____. (0.5)

b. A clearance becomes valid when _____ signs the "Check and Accepted By" block on the clearance form. (0.25)

c. Supplementary Clearances can NOT be used during _____. (0.25)

QUESTION: 23 (1.50)

MATCH the area of the body exposed, in COLUMN A, with the quarterly exposure limit in COLUMN B according to procedure RSP-0203, "Personnel Monitoring." (Items in COLUMN B may be used more than once.)

| | COLUMN A | COLUMN B | |
|---|---|---|---|
| a. | Whole Body | 1. | 1.25 REM |
| b. | Skin of Whole Body | 2. | 5.0 REM |
| c. | Feet and Ankles | 3. | 7.5 REM |
| d. | Active Blood Forming Organs | 4. | 18.75 REM |
| e. | Lens of Eyes | | |
| f. | Hands and Forearms | | |

QUESTION: 24 (1.00)

a. STATE the THREE personnel protective equipment items required when racking IN or OUT electrical breakers of 4160 volts or above. (0.75)

b. STATE the ONE personnel protective equipment item required when racking IN or OUT 480 volt load center breakers. (0.25)

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

QUESTION: 25 (1.00)

SELECT the action required according to ADM-0015, "Station Surveillance Test Program":

While performing a Surveillance Test Procedure (STP), an indicator which should be lit is NOT LIT due to maintenance on its power supply. "Verifying the indicator lit" is not required to satisfy the STP acceptance criteria. The action necessary to continue the STP is to:

a. notify the Shift Supervisor/Control Operating Foreman and obtain his/her approval to continue.

b. complete an "Exception Report," attach it to the STP and continue.

c. treat the step as a "Test Exception," provide a justifying comment on the Data Package Cover Sheet and continue.

d. complete a "Temporary Change Notice" and continue once necessary TCN approvals are obtained.

QUESTION: 26 (1.00)

SELECT the choice that correctly completes this statement:

The flux noise region is defined as greater than the _____ rod line and less than _____ percent core flow.

a. 75%, 30%

b. 75%, 45%

c. 80%, 30%

d. 80%, 45%

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

QUESTION: 27 (2.00)

FILL IN THE BLANKS concerning RBS facility fire safety according to ADM-002, "Conduct of Operations":

a. A fire brigade of at least _____ member(s) shall be maintained on site at all times. (0.5)

b. Members of the fire brigade shall be designated each shift in the _____ log book. (0.5)

c. The ____1____ will ensure a fully manned fire brigade is present on each shift and the ____2____ will act as fire brigade leader. (1.0)

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

ANSWER: 01 (1.00)

b. and c. (0.5 pts each)

REFERENCE:

RBS, EOP-0002, REV. 7, p. 2
295030G011 295029G011 ..(KA's)

ANSWER: 02 (1.00)

a. Condensate System (injection via feedwater lines)
b. HPCS injection
c. Standby Service Water (via RHR-B or via FPC Heat Exchangers)
[Any 2 @ 0.5 pts each]

REFERENCE:

AOP-0027, Rev. 4, p. 3
295023K202 ..(KA's)

ANSWER: 03 (1.00)

b.

REFERENCE:

AOP 0001, Rev. 3, p. 2
295006G011 ..(KA's)

ANSWER: 04 (1.00)

c.

REFERENCE:

AOP-0001, Rev. 3, p. 6
295006G007 ..(KA's)

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

ANSWER: 05 (2.00)

a. 2
b. 1
c. 2
d. 3
(0.5 pts each)

REFERENCE:

AOP-0031, Rev. 3, p. 6
295016G010 ..(KA's)

ANSWER: 06 (2.00)

a. MSL rad monitors
b. Containment purge isolation rad monitors
c. Reactor building annulus vent exhaust rad monitor
d. Fuel building vent exhaust rad monitor
[0.5 pts each]

REFERENCE:

RBS Tech. Spec., Table 3.3.2-2; LOTM-51-2 Table 2
295017K214 ..(KA's)

ANSWER: 07 (1.00)

d.

REFERENCE:

EOP-1A
295015G010 ..(KA's)

ANSWER: 08 (1.00)

c.

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

REFERENCE:

RBS EOP Bases Documents
295027G007 295027K103 ..(KA's)

ANSWER: 09 (1.00)

d.

REFERENCE:

RBS, EIP-2-025, Rev. 2, p. 2 & 3
295017K102 ..(KA's)

ANSWER: 10 (1.00)

c.

REFERENCE:

RBS EOP Appendix B, p. 91
295037A202 ..(KA's)

ANSWER: 11 (1.00)

c.

REFERENCE:

AOP-0050, Rev. 2, p. 11, 12
295003A204 ..(KA's)

ANSWER: 12 (1.00)

b.

REFERENCE:

OSP-0009, Author's Guide/Control and Use of EOPs, Rev. 4, p. 5
295007G012 ..(KA's)

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

ANSWER: 13 (1.00)

b.

REFERENCE:

EOP-1, Rev. , step 7
295024K214 ..(KA's)

ANSWER: 14 (3.00)

a. 1, 2
b. 2, 3
c. 1
d. 4
(0.5 pts each)

REFERENCE:

RBS EOPs
295028G011 295026G011 295024G011 295036G011 295031G011
..(KA's)

ANSWER: 15 (1.00)

b.

REFERENCE:

LOTM-27-2, p. 67
295025K208 ..(KA's)

ANSWER: 16 (1.00)

b.

REFERENCE:

AOP-0008, Rev. 3, p. 2, 4
295019K207 ..(KA's)

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

ANSWER: 17 (2.00)

a. 4 (1.0)
b. 1 (1.0)

REFERENCE:

AOP-0002, Rev. 3, p. 3, 4
295005K301 295005K101 ..(KA's)

ANSWER: 18 (1.00)

a.

REFERENCE:

AOP-0011, Rev. 3, p. 2, 3
295018K201 ..(KA's)

ANSWER: 19 (1.00)

d.

REFERENCE:

RBS EOP-1
295028G012 ..(KA's)

ANSWER: 20 (1.00)

b.

REFERENCE:

RBS Tech. Spec. Bases 3/4.3.4
295025G004 ..(KA's)

ANSWER: 21 (1.00)

b.

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

REFERENCE:

AOP-0024, Rev. 4, p. 2, 3
295001G010 ..(KA's)

ANSWER: 22 (1.00)

d.

REFERENCE:

SOP-0022, Rev. 2, p. 2, 2a
295019G007 ..(KA's)

ANSWER: 23 (1.00)

d.

REFERENCE:

AOP-0008, Rev. 3, p. 2, 3
295019G010 ..(KA's)

ANSWER: 24 (2.00)

a. 2
b. 1
c. 4
d. 6
(0.5 pts each)

REFERENCE:

AOP-0005, Rev. 4, p. 2
295002K202 295002K203 ..(KA's)

ANSWER: 25 (1.00)

a. 6
b. Deleted
c. 4
[0.5 pts each]

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

REFERENCE:

AOP-0008, Rev. 4, p. 2; and LOTM-44-2, p. 9
295019A201 295019K214 ..(KA's)

ANSWER: 26 (1.00)

b.

REFERENCE:

RBS EOP Basis, EOP-2, Step 11, 12, 13 and 14; LOTM-45-2, p. 2.
295024K303 ..(KA's)

ANSWER: 27 (1.00)

c.

REFERENCE:

RBS EOP-1, Enclosure 1, p. 4 and 5.
295031A201 ..(KA's)

ANSWER: 28 (1.00)

a.

REFERENCE:

RBS EOP-1A Basis, pp. 88 and 89.
295037K301 ..(KA's)

ANSWER: 29 (1.00)

b.

REFERENCE:

RBS EOP-1A Basis, p. 88 and 89.
295006K306 ..(KA's)

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

ANSWER: 30 (1.00)

a.

REFERENCE:

RBS EOP Caution #8; LOTM-45-2, p. 3-4.
295029K206 ..(KA's)

ANSWER: 31 (2.50)

a. 2
b. 4
c. 2
d. 2
e. 1
[0.5 pts each]

REFERENCE:

LOTM-64-2, p. 20 (Table 1).
295033K204 ..(KA's)

ANSWER: 32 (0.00)

deleted

REFERENCE:

deleted
295035A102 ..(KA's)

ANSWER: 33 (1.00)

c.

REFERENCE:

AOP-0007-4, p. 2.
295014K106 ..(KA's)

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

ANSWER: 34 (1.00)

a. Feedwater System [0.5]
b. running (on LFMG) [0.5]

REFERENCE:

AOP-0001-5, pp. 3 and 4.
295006K202 ..(KA's)

ANSWER: 35 (1.00)

a. Safety Relief Valves
b. Reactor Core Isolation Cooling (RCIC)
[0.5 pts each; any order]

REFERENCE:

AOP-0050-2, p. 2.
295003G010 ..(KA's)

ANSWER: 36 (1.00)

1. primary system (boundary) break [+0.5]
2. fire [+0.5]

REFERENCE:

RBS EOP-3, p. 187 and 188.
295032A203 ..(KA's)

ANSWER: 37 (1.00)

a.

REFERENCE:

GOP-0003-5, para. 3.0.
295008A101 ..(KA's)

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

ANSWER: 38 (1.00)

d.

REFERENCE:

LOTM-6-2, p. 32 and GOP-001, Rev. 10, p. 3.
295014G010 ..(KA's)

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

ANSWER: 01 (2.00)

a. 1. excessive cooling water pressure/flow
2. scram inlet valve leaking
3. scram outlet valve leaking
4. rod drift test in progress
5. directional control valve (122) failure
6. stuck collett piston
7. loss of instrument air
(Any 4 @ 0.25 pts each)

b. 1. reactor pressure
2. accumulator
(0.5 pts each)

REFERENCE:

ARP-680-07 (Vol 18 tab N, p. 10); LOTM-4-2, p. 16; LOTM-4-2, p. 17.
201001G013 201002G004 ..(KA's)

ANSWER: 02 (2.00)

a. 3
b. 6
c. 5
d. 5
[0.5 pts each]

REFERENCE:

LOTM-8-3, Fig. 5, p. 12, 14.V.B, 14.V.C., 16; LOTM-8-2, p. 11;
LOTM-3-2, p. 5.
202002A301 ..(KA's)

ANSWER: 03 (1.00)

b.

REFERENCE:

LOTM-9-2, p. 1.I.B, 8, 15, 16, and 21 (Table 2).
215004A401 ..(KA's)

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

ANSWER: 04 (1.00)

1. squib valve fires
2. pump suction valve opens
3. Reactor Water Cleanup System (RWCS) isolation
4. pump starts
[0.25 pts each]

REFERENCE:

LOTM-16-2, pp 2 and 6.
211000K408 ..(KA's)

ANSWER: 05 (1.00)

b.

REFERENCE:

LOTM-17-2, pp. 1, 3, 5, and 6.
209001G014 ..(KA's)

ANSWER: 06 (1.00)

c.

REFERENCE:

LOTM-18-2, p. 2, 3, 6, and 22 (alarm 2344 caution).
209002K103 ..(KA's)

ANSWER: 07 (1.00)

c.

REFERENCE:

LOTM-20-3, p. 14 (Fig. 11); LOTM-20-2, pp. 6 (Fig. 5), 8, and 11.
217000A202 ..(KA's)

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

ANSWER: 08 (1.50)

1. Stop all low pressure ECCS pumps.
2. Depress the timer reset pushbutton prior to the end of the (105 second) time delay.
3. Operate the ADS MANUAL INHIBIT keylock switches to INHIBIT.

REFERENCE:

LOTM-21-2, pp. 2, 3, 4, and 5.C.1.
218000K501 ..(KA's)

ANSWER: 09 (1.00)

1. Low Reactor Water Level - Level 1
2. Time Delay (105 seconds)
[0.5 pts each]

REFERENCE:

LOTM-21 -, p. 2-3.
218000A402 ..(KA's)

ANSWER: 10 (1.00)

a.

REFERENCE:

LOTM-34-2, Section V, p. 13.V.A.
259002K605 259002K604 ..(KA's)

ANSWER: 11 (1.00)

1. McKnight 500 KV
2. Big Cajun (CEPCO) 500 KV
3. Port Hudson 230 KV
4. Enjay 230 KV
5. Big Cajun (CEPCO) 230 KV
(Any 2 @ 0.5 pts each, voltage ratings not required)

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

REFERENCE:

LOTM-56-2, Section B.1, p. 2 (Fig. 1, 2, and 8).
262001K201 ..(KA's)

ANSWER: 12 (1.00)

d.

REFERENCE:

LOTM-57-2, p. 2.
263000K402 ..(KA's)

ANSWER: 13 (1.00)

a.

REFERENCE:

LOTM-57-2, p. 2.
263000A401 263000K402 ..(KA's)

ANSWER: 14 (1.00)

a. 1
b. 5
c. 2
[One-third pts each for 1.0 total]

REFERENCE:

LOTM-57, p. 10
263000G004 ..(KA's)

ANSWER: 15 (1.00)

c.

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

REFERENCE:

LOTM-61-2, Section 2, p. 11, 12, 13, and 14.
290003K101 290003K401 ..(KA's)

ANSWER: 16 (1.50)

a. 3
b. deleted
c. 1
d. 2
[0.5 pts each]

REFERENCE:

LOTM-6-2, p. 3.C.1, 4.II.A.4, 11.F, 15.3, 3.C.2, and 2.
214000G007 ..(KA's)

ANSWER: 17 (1.00)

a.

REFERENCE:

SOP-0090, para. 4.12.
204000K302 ..(KA's)

ANSWER: 18 (1.00)

a. 3 seconds
b. 5 seconds
[0.5 pts each]

REFERENCE:

LOTM-24-2, p. 7.E.
239001K401 ..(KA's)

ANSWER: 19 (1.00)

c.

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

REFERENCE:

LOTM-70-2, Table 3.
234000A302 ..(KA's)

ANSWER: 20 (1.00)

a.

REFERENCE:

LOTM-7-3, p. 21.
290002K603 ..(KA's)

ANSWER: 21 (1.00)

a.

REFERENCE:

RBS EIP-2-012, p. 2.
294001K103 ..(KA's)

ANSWER: 22 (1.00)

a. 1. destroyed
2. lined out
b. requestor
c. refueling (outages)
[0.25 pts each]

REFERENCE:

ADM-0027, "Protective Tagging," pp. 7.1.2.5 (Note), 7.1.6, and 7.2 (Note).
294001K102 ..(KA's)

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

ANSWER: 23 (1.50)

a. 1
b. 3
c. 4
d. 1
e. 1
f. 4
[0.25 pts each]

REFERENCE:

RBS RSP-0203, Rev. 3, "Personnel Monitoring," para. 5.2.1.1, .4, and .5.
294001K103 ..(KA's)

ANSWER: 24 (1.00)

a. 1. protective flash suit [0.25]
2. hood [0.25]
3. tested electrical gloves [0.25]
b. head shield (or face shield) [0.25]

REFERENCE:

Standing Order #68, dated July 21, 1989, Rev. 2.
294001K107 ..(KA's)

ANSWER: 25 (1.00)

c.

REFERENCE:

ADM-0015, Rev. 13, "Station Surveillance Test Program," p. 13.
294001A102 ..(KA's)

ANSWER: 26 (1.00)

d.

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

REFERENCE:

Standing Order #67.
294001A108 ..(KA's)

ANSWER: 27 (2.00)

a. five (5) [0.5]
b. control room [0.5]
c. 1. Shift Supervisor (SS) [0.5]
2. Nuclear Control Operator (NCO) [0.5]

REFERENCE:

ADM-0022, "Conduct of Operations," para. 4.1, 3.2.4.23, and 3.2.7.9.
294001K116 ..(KA's)

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

| QUESTION | VALUE | REFERENCE |
|---|---|---|
| 01 | 1.00 | 9000195 |
| 02 | 1.00 | 9000196 |
| 03 | 1.00 | 9000197 |
| 04 | 1.00 | 9000198 |
| 05 | 2.00 | 9000199 |
| 06 | 2.00 | 9000200 |
| 07 | 1.00 | 9000201 |
| 08 | 1.00 | 9000202 |
| 09 | 1.00 | 9000203 |
| 10 | 1.00 | 9000204 |
| 11 | 1.00 | 9000205 |
| 12 | 1.00 | 9000206 |
| 13 | 1.00 | 9000207 |
| 14 | 3.00 | 9000208 |
| 15 | 1.00 | 9000209 |
| 16 | 1.00 | 9000210 |
| 17 | 2.00 | 9000211 |
| 18 | 1.00 | 9000212 |
| 19 | 1.00 | 9000213 |
| 20 | 1.00 | 9000214 |
| 21 | 1.00 | 9000215 |
| 22 | 1.00 | 9000216 |
| 23 | 1.00 | 9000217 |
| 24 | 2.00 | 9000218 |
| 25 | 1.00 | 9000219 |
| 26 | 1.00 | 9000220 |
| 27 | 1.00 | 9000221 |
| 28 | 1.00 | 9000222 |
| 29 | 1.00 | 9000223 |
| 30 | 1.00 | 9000224 |
| 31 | 2.50 | 9000225 |
| 32 | 0.00 | 9000226 |
| 33 | 1.00 | 9000227 |
| 34 | 1.00 | 9000228 |
| 35 | 1.00 | 9000229 |
| 36 | 1.00 | 9000230 |
| 37 | 1.00 | 9000231 |
| 38 | 1.00 | 9000232 |
| | 44.50 | |
| 01 | 2.00 | 9000234 |
| 02 | 2.00 | 9000235 |
| 03 | 1.00 | 9000236 |
| 04 | 1.00 | 9000237 |
| 05 | 1.00 | 9000238 |
| 06 | 1.00 | 9000239 |
| 07 | 1.00 | 9000240 |
| 08 | 1.50 | 9000241 |
| 09 | 1.00 | 9000242 |
| 10 | 1.00 | 9000243 |
| 11 | 1.00 | 9000244 |
| 12 | 1.00 | 9000245 |
| 13 | 1.00 | 9000246 |

| QUESTION | VALUE | REFERENCE |
|---|---|---|
| 14 | 1.00 | 9000247 |
| 15 | 1.00 | 9000248 |
| 16 | 1.50 | 9000249 |
| 17 | 1.00 | 9000250 |
| 18 | 1.00 | 9000251 |
| 19 | 1.00 | 9000252 |
| 20 | 1.00 | 9000253 |
| 21 | 1.00 | 9000233 |
| 22 | 1.00 | 9000254 |
| 23 | 1.50 | 9000255 |
| 24 | 1.00 | 9000256 |
| 25 | 1.00 | 9000257 |
| 26 | 1.00 | 9000258 |
| 27 | 2.00 | 9000259 |
| | 31.50 | |
| | 76.00 | |

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

AREA CODE 504 635-6094 346-8651

October 19, 1989
NT-2799
RBG- 31649

David Graves
US Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

FILE CODE: G1.41.50
NRC EXAMINATION CONFIDENTIAL
RIVER BEND STATION - UNIT 1

Dear Mr. Graves:

Attached are the comments on the Reactor Operator and Senior Reactor Operator Examinations administered on October 17, 1989.

If you have any questions, please contact R. N. Jackson, Nuclear Training Coordinator-License, at (504) 381-4211.

Sincerely,

for

Dale L. Andrews
Director-Nuclear Training

DLA/RNJ/jt

cc: W. H. Odell
R. N. Jackson
SDC

**FACILITY COMMENTS ON NRC EXAM ADMINISTERED OCTOBER 17, 1989**

**REACTOR OPERATOR EXAMINATION**

**EMERGENCY ABNORMAL PLANT EVOLUTIONS**

**Question .03 item a.**

COMMENT — Suppression Pool temperature of 112°F requires the mode switch to be placed in shutdown (110°F). This would require entry to EOP-1 if the reactor was greater than 1% of Rated Thermal Power in Modes 1 or 2. If the mode switch is in shutdown, no scram is required and no EOP entry is required.

RECOMMENDATION — Accept either 1 or 4 as a correct response since an assumption is required on the part of the candidate.

REFERENCE — T.S. 3.6.3, Depressurization Systems, Suppression Pool.

**Question .04**

COMMENT — Referenced K/A requires, "Knowledge of the reasons for the following responses as they apply to High Drywell Pressure:

EK3.03 Containment Venting: Mark-III"

This K/A does not require memorization of the procedural flowpath. In addition, since this flowpath is provided in Enclosure 21 of the EOP, memorization is not required.

RECOMMENDATION — Delete this question.

**Question .07**

COMMENT

Referenced K/A (295006K3.06) states

"Knowledge of reasons for the following responses as they apply to SCRAM:

AK 3.06 Recirculation pump speed reduction"

This K/A applies to transfer from fast to slow speed after a reactor scram in order to prevent pump cavitation due to reduced feedwater flow. This APE is not intended to address an ATWS condition. In addition, the EOP-Basis pp. 88-89 states the bases for not tripping the pumps is so they will be available for mixing should SLC injection be required. While not "required" or necessary for mixing, pump operation does enhance mixing. If not this mixing affect, the pumps would be tripped to get any power reduction available.

RECOMMENDATION

"a" should be considered a correct response since the reason pumps are not tripped is because of the mixing provided.

**Question .08**

COMMENT 1

Referenced K/A applies only to an incorrect response.

COMMENT 2

Max safe level is determined by figure 7 EOP-1 unless indicated level is offscale. The question addresses max safe which would be greater than 21.27 feet. Offscale of control room instrumentation is 24 feet. The indicated correct response is only applicable above 24 feet.

COMMENT 3

With level offscale high, level can be as high as 85 feet before another unsafe level is indicated (EOP-1 step 50) with water level at 85 feet, a drywell pressure of 36.8 psig would be required to vent through the horizontal vents. Since this exceeds the drywell structural design, answer d may be a correct response.

RECOMMENDATION — Accept either "a" or "d" as correct possible consequences, or delete the question.

**Question 10**

COMMENT — Both "b" and "d" are correct. References LOTM-63-2, page 5 of 32 and LOTM-64-2, page 16 of 20.

RECOMMENDATION — Accept either "a" or "d", or delete question.

**Question 18**

COMMENT — Question is open ended and may be interpreted by the candidates in a variety of ways depending upon what is considered a "source".

RECOMMENDATION — Accept any two answers such as valve packing leak, pipe rupture, RCIC, RWCU, etc.

**Question 20**

COMMENT 1 — Bypass valves control pressure. In Hot Standby (with turbine off-line) a turbine trip is not anticipated. The statement from AOP-0009 reads

4.1 "Scram the reactor...if the turbine is on line or bypass valves are controlling reactor pressure in the Hot Standby mode."

RECOMMENDATION — Reword question before uploading to NRC exam bank.

## PLANT SYSTEMS

**Question 05**

COMMENT — SOP-0028 has operator verify several additional "actions" which occur. Any of these actions (steps 5.3, 5.4, 5.5, 5.6, 5.8) should be accepted for correct actions i addition to power decreasing.

RECOMMENDATION — Accept any of the following as correct in addition to those listed.

1. Squib continuity light extinguishes
2. Standby Liquid System A(B) Inoperative annunciator annunciates.
3. System pressure indicates greater than reactor pressure.
4. SLC storage tank level decreases.
5. APRM power decreases.

**Question 23 part b**

COMMENT — Answer b should be either 1, 2, or 3. The substitute position pushbutton may be used to bypass a faulty reed switch. The RGDS will also bypass the rod, but further rod movement will not be allowed.

RECOMMENDATION — Accept 1, 2, or 3 as correct responses.

**Question 26**

COMMENT — Both b and d are correct according to reference document (highlighted copy attached).

RECOMMENDATION — Accept either b or d as correct responses.

**Question 27**

COMMENT — River Bend does not require operators to memorize the reclosure setpoints of the low-low set valves. The Hot License Objectives (HLO) required knowledge to the opening setpoint for the safety relief valves and knowledge of the function performed by the low-low set features. (HLO-007 objectives 6-9).

RECOMMENDATION — Delete the requirement for reset setpoints for low-low set function in part b.

**Question 29**

COMMENT — Question is poorly worded. Operation at 65% does not mean greater than 50% in operating loops if a single pump trips. The premise is misleading and confusing. The discussion in the reference deals with the reason for reducing flow in the remaining loop to less than 50%. With power at 65% prior to pump trip, the operators cannot determine loop flow or rod line without additional information Therefore, none of the answers may be correct. (May be at 100% rod line and approximately 50% core flow prior to trip and operating loop flow would decrease to 41%).

RECOMMENDATION — Delete this question.

**Question 37**

COMMENT 1 — This information is provided to the operators on an attachment to AOP-0024, "Decrease in Recirculation System Flowrate." The immediate actions require the operator to verify the plant is not operating within the delineated regions. There is no requirement and no need for the operators to memorize the boundaries of this region.

COMMENT 2 — Referenced K/A is a generic statement that states the candidate should demonstrate his ability to interpret material such as graphs, etc., but does not require memorization.

RECOMMENDATION — Delete this question.

## SRO EXAM

**Question 5.15**

COMMENT — Both a and b are correct according to the question reference. Item a will result in bypass valves opening and plant depressurization until MSIVs closed on MSL low pressure and high pressure transient may result. Item b will result in a high pressure transient if power is above the bypass valve capacity.

RECOMMENDATION — Accept either a or b for full credit.

**Question 5.25**

COMMENT 1 — While the air compressors still receive an auto start signal at 110 psig, current operating practice (see attached page from SOP-0022 precaution 2.8) has all 3 compressors running at all times if all 3 are available.

COMMENT 2 — River Bend does not normally require operators to memorize system alarm setpoints. River Bend instead requires the operators to respond to the alarm actuation which has been set at a value conservatively chosen to permit timely corrective action using the plant procedures.

RECOMMENDATION — Delete part b.

**Question 5.29**

COMMENT/RECOMMENDATION See RO exam comment E/APE question 07.

**Question 5.30**

COMMENT/RECOMMENDATION See RO exam comment E/APE question 08.

**Question 5.32**

COMMENT/RECOMMENDATION See RO exam comment E/APE question 10.

**Question 5.36**

COMMENT/RECOMMENDATION See RO exam comment E/APE question 18.

**Question 6.16**

COMMENT/RECOMMENDATION See RO exam comment Systems 23.b.

**Question 6.20**

COMMENT/RECOMMENDATION See RO exam comment Systems No. 29.

**Question 6.26**

COMMENT/RECOMMENDATION See RO exam comment Systems No. 37.

## 5.0 SYSTEM OPERATION

NOTE

The following controls and indications are on 1H13-P601 unless stated otherwise.

| CAUTION |
| --- |
| Once system is initiated, injection should be allowed to procede until completion. |

5.1 Verify 1C41*VF031 TEST TANK INLET V is closed.

5.2 Place C41-S1A(B) SLC PUMP A(B) to RUN.

5.3 Verify that the white squib continuity lamp for the explosive valve extinguishes and Alarm 2143 (2144) STANDBY LIQUID SYSTEM A(B) INOPERATIVE annunciates.

5.4 Verify that the RWCU System has isolated (1G33*F001 or F004 close).

5.5 Verify 1C41*F001A(B) STOR TNK OUTLET V has opened and pump has started.

5.6 If pump or storage tank outlet valve fails to function, place the selected switch to STOP and start the alternate.

5.7 Verify system pressure is greater than reactor pressure.

5.8 Monitor SLC storage tank level.

PLANT System Question 5

| CAUTION |
| --- |
| Do not allow the tank level to decrease to a point where the pump could lose suction. |

5.9 When the storage tank level indicator reads zero, STOP SLC PUMP A(B).

NOTE

Total injection time is approximately 50 to 125 minutes.

indicator lamps located on panel P601-19C are associated with logic A. Logic A solenoids also have Red/Green indicator lamps located on panel P628. Logic B is provided with CLOSE-AUTO-OPEN keylock switches for each SRV and corresponding Red/Green indicator lamps on panel P631.

D. Main Steam line Flow Restrictors (Figure 11)

Downstream of the last SRV in each steam line, and upstream of the associated inboard MSIV is a venturi type flow restrictor. These flow restrictors provide the following functions:

- To limit the steam flow in a severed main steamline to approximately 200% of rated flow for that line, thus limiting the rate of coolant loss prior to MSIV automatic closure.
- To limit the differential pressure across the steam dryer caused by high steam flow rates.
- To provide a steamline flow signal to the Nuclear Steam Supply Shutoff System.

E. Main Steam Isolation Valves (MSIV)

Each steamline contains two MSIVs, an inboard valve and an outboard valve. The inboard valves (F022 A, B, C and D) are located in the drywell, while the outboard valves (F028 A, B, C, and D) are just outside the primary containment (Figures 1 and 2).

Each MSIV (Figure 12) is a 24 inch diameter pneumatic-opening, spring and/or pneumatic closing, internally-balanced poppet type globe valve. Flow through the MSIV is rated at $3.11 \times 10^6$ lb/hr. Each is designed to be able to close for one hour following an accident condition environment of 340°F and design containment pressure. Each MSIV is designed to close in greater than three but less than five seconds. The minimum closing time of three seconds is to prevent valve damage and to lessen the pressure transient to the reactor pressure vessel caused by MSIV closure during operation. The maximum closure time of five seconds is to limit the loss of coolant caused by a steam line rupture and to provide for adequate containment of fission products in the event of a fuel element failure.

Ques 26
RO Exam
Systems

## 1.0 PURPOSE

The purpose of this procedure is to provide instruction to the station operating personnel for the operation of the station Instrument Air System IAS.

## 2.0 PRECAUTIONS AND LIMITATIONS

2.1 On a loss of Turbine Plant Component Cooling Water Systems, the loaded air compressor will trip on high air temperature [aftercooler discharge equal to or greater than 130°F or first stage air discharge equal to or greater than 295°F]. Any running, unloaded compressor should be manually tripped.

2.2 If a compressor trips on high temperature due to loss of cooling water, allow it to cool to ambient air temperature before restarting. Introducing cooling water to hot cylinder walls may crack them.

2.3 Following starting of an air compressor, verify (locally) oil pressure increases to greater than 20 psig; if it does not increase, then manually trip. Compressor will trip on low oil pressure after a 15 second time delay.

2.4 Air compressor motor full load amps: 302 Amps; locked rotor amps: 1585 Amps.

2.5 The compressor motor may be started twice successively from ambient temperature or once from rated motor temperature.

NOTE

A start means that the motor has come up to rated speed.

SRO

5.1

2.5.1 Wait 60 minutes before next start.

2.5.2 When needed for emergencies, the motor can be assumed to have returned to rated temperature after 30 minutes at standstill or 10 minutes running time at which time another start is permissible.

2.6 Ensure the SEQUENCE SELECTOR SWITCH is maintained in a position that corresponds to the running compressors to maintain the proper lead-lag operation of the compressors.

2.7 In the event of a failure of 1IAS-PC56 the SEQUENCE SELECTOR panel to correctly control the compressors, open up panel and close MV-1 (ball valve). The compressors will unload and control header pressure at 110 psig. If a higher header pressure is desired, maintenance must read just unloader settings.

2.8 Run all 3 Instrument Air Compressors at all times if all 3 compressors are available. This will prevent the compressor internals from becoming galled while the compressor is left idle.