

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Operator Licensing Examination Report: 50-458/OL 89-01

Docket No.: 50-458

Operating License No.: NPF-47

Licensee: Gulf States Utilities
P. O. Box 2951
Beaumont, TX 77704

Facility: River Bend Station

Examinations at: River Bend Station (RBS)

Chief Examiner: John L. Pellet 3/20/89
for D. N. Graves, Examiner Date
Operator Licensing Section
Division of Reactor Safety

Approved by: John L. Pellet 3/20/89
J. L. Pellet, Chief Date
Operator Licensing Section
Division of Reactor Safety

Summary

NRC Administered Examinations Conducted the Weeks of February 14-17, and
22-23, 1989 (Report 50-458/OL 89-01)

NRC administered examinations to four RO and nine SRO applicants. All thirteen candidates passed all portions of their examinations and have been issued the appropriate license. Several simulation facility fidelity items were noted and are detailed in the Simulator Fidelity Report.

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FDR ADOCK 05000458
V PDC

DETAILS

1. Persons Examined

	<u>SRO</u>	<u>RO</u>	<u>Total</u>
License Examinations: Pass -	9	4	13
Fail -	0	0	0

2. Examiners

D. N. Graves, Chief Examiner
J. L. Pellet
K. M. Spencer
J. M. Mcghee

3. Examination Report

Performance results for individual examinees are not included in this report as it will be placed in the NRC Public Document Room and these results are not subject to public disclosure.

a. Examination Review Comment and Resolution

In general, editorial comments or changes made during the examination, or subsequent grading reviews are not addressed by this resolution section. This section reflects resolution of substantive comments made by RBS staff. The only comments addressed in this section are those which were not accepted for incorporation into the examination or answer key. Those comments accepted are incorporated into the master examination key, which is included in this report. Comments may be paraphrased for brevity. The full text of the comments is attached.

3.31a Request additional correct answer to read "Use in critical or emergency situations only."

Response: The question specifically asks for the purpose of the 2000 series key, which is to open valve locks.

5.16 Request additional correct answer to read "downshift recirculation pumps to LFMG."

Response: The pumps are downshifted to prevent a turbine trip on high level when they are tripped, not to add negative reactivity.

6.27 Request additional correct answers to be "b", "c", and "d".

Response: In all cases, the Recovery Manager is making the recommendations. He/she may be acting in an additional capacity as well, such as Emergency Director, but he/she is still the Recovery Manager.

b. Site Visit Summary

- (1) At the end of the written examination administration, the facility licensee was provided a copy of the examination and answer key for the purpose of commenting on the examination content validity. The licensee was informed that written examination grading would not be started until licensee review comments were received in the regional office. A set of comments was provided to and discussed with the Chief Examiner at the end of the first week of examinations prior to leaving the site.
- (2) The following items were communicated to the facility licensee representatives as comments, observations, suggestions, or deficiencies:
 - (a) When shifting the recirculation pumps to fast speed, the switches had to be held in the "START" position for several seconds to effect the transfer. Failure to do so resulted in the trip of the pump. If the switches do need to be held in a specific position for a specific length of time, the procedure should address this fact. If the switch does not need to be held in the required position for that length of time, then the simulator does not correctly model actual plant conditions.
 - (b) A number of candidates were not aware that copies of Radiation Work Permits were kept in the Shift Supervisor's office.

c. Master Examination and Answer Key

Master copies of the RBS license examinations and answer keys are attached. The facility licensee comments which have been accepted are incorporated into the answer key.

d. Facility Examination Review Comments

The facility licensee comments regarding the written examinations are attached. Those comments not incorporated into the answer key have been addressed in the resolution section of this report.

e. Simulation Facility Fidelity Report

All items in the attached Fidelity Report have been discussed with the licensee staff.

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

FACILITY: River Bend 1
 REACTOR TYPE: BWR-GE6
 DATE ADMINSTERED: 89/02/14

INSTRUCTIONS TO CANDIDATE:

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

CATEGORY VALUE	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE	CATEGORY
25.00	25.64			1. REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (11%) (FUNDAMENTALS EXAM)
26.00	26.67			2. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (27%)
46.50	47.69			3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)
97.50			%	TOTALS
				FINAL GRADE

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

 Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.
2. 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.
3. Use black ink or dark pencil only to facilitate legible reproductions.
4. Print your name in the blank provided on the cover sheet of the examination.
5. Fill in the date on the cover sheet of the examination (if necessary).
6. Use only the paper provided for answers.
7. Print your name in the upper right-hand corner of the first page of each section of the answer sheet.
8. Consecutively number each answer sheet, write "End of Category __" as appropriate, start each category on a new page, write only on one side of the paper, and write "Last Page" on the last answer sheet.
9. Number each answer as to category and number, for example, 1.4, 6.3.
10. Skip at least three lines between each answer.
11. Separate answer sheets from pad and place finished answer sheets face down on your desk or table.
12. Use abbreviations only if they are commonly used in facility literature.
13. The point value for each question is indicated in parentheses after the question and can be used as a guide for the depth of answer required.
14. Show all calculations, methods, or assumptions used to obtain an answer to mathematical problems whether indicated in the question or not.
15. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.
16. If parts of the examination are not clear as to intent, ask questions of the examiner only.
17. You must sign the statement on the cover sheet that indicates that the work is your own and you have not received or been given assistance in completing the examination. This must be done after the examination has been completed.

18. When you complete your examination, you shall:

a. Assemble your examination as follows:

(1) Exam questions on top.

(2) Exam aids - figures, tables, etc.

(3) Answer pages including figures which are part of the answer.

b. Turn in your copy of the examination and all pages used to answer the examination questions.

c. Turn in all scrap paper and the balance of the paper that you did not use for answering the questions.

d. Leave the examination area, as defined by the examiner. If after leaving, you are found in this area while the examination is still in progress, your license may be denied or revoked.

1. REACTOR PRINCIPLES (7%) THERMODYNAMICS
(7%) AND COMPONENTS (11%) (FUNDAMENTALS EXAM)

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QUESTION 1.01 (0.00)

GENERIC FUNDAMENTALS EXAM

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

QUESTION 2.01 (2.00)

The "At the Controls" operator will manually initiate a reactor scram when one of two general conditions are met. State these two general conditions per AOP-0001, "Reactor Scram." (2.0)

QUESTION 2.02 (2.00)

The automatic actions listed for a main turbine and generator trip per AOP-0002, "Main Turbine and Generator Trips", include reactor scrams. For parts "a" and "b" below select the answer from items 1 - 4 that will initiate the reactor scram.

a. The turbine trips from 15% reactor power (1.0)

1. Main turbine stop valve position
2. Turbine control valve position
3. Reactor vessel level
4. APRM

b. The turbine trips from 45% reactor power (1.0)

1. Main turbine stop valve position
2. Turbine control valve position
3. Reactor vessel level
4. APRM

QUESTION 2.03 (2.00)

River Bend EOP's acknowledge three viable mechanisms of adequate core cooling. List the three mechanisms, INCLUDING which one is preferred. (2.0)

QUESTION 2.04 (1.00)

A scram condition exists (MSIVs shut) with the reactor at power. The reactor did not shutdown. Core cooling is adequate. Which concern below is being most severely challenged in this condition? (1.0)

- a. fuel integrity
- b. RPV integrity
- c. containment integrity
- d. injection system operability

QUESTION 2.05 (2.50)

If the control rods fail to insert when required on a scram, state FIVE (5) methods that may be tried to obtain control rod insertion per EOP-1A. (2.5)

QUESTION 2.06 (0.50)

If boron injection is required and SLC is not available, what is the most reliable alternate method of injecting boron at River Bend? (0.5)

QUESTION 2.07 (2.50)

The reactor is operating at 100% when one recirculation pump trips due to an electrical fault.

- a. What immediate actions are required per AOP-0024, "Decrease in Recirculation System Flow Rate"? Include any conditional actions, (i.e. If ..., then ...) and values as applicable. (1.5)
- b. Even though Technical Specifications allow for operation of the plant in single loop, what additional authorization is required? (0.5)
- c. What is the main operational concern due to a loss of forced recirculation through the core? (0.5)

QUESTION 2.08 (2.00)

- a. A loss of 125 VDC has occurred. How should the main turbine be tripped if the trip pushbutton on the EHC panel does not function? (1.0)
- b. If the loss of DC involved control power to the main generator output breakers, what negative consequence would occur as a result of tripping the main turbine? (1.0)

QUESTION 2.09 (1.00)

- a. During a station blackout (loss of all AC, including EDGs), what is the only system capable of injecting into the RPV? (1.0)

QUESTION 2.10 (2.00)

- a. Describe why both an increase and a decrease in Off Gas flow might be indicative of the cause of a loss of condenser vacuum. (1.0)
- b. At what point during a loss of condenser vacuum would a reactor scram automatically occur (setpoint) and what would initiate it? Assume NO OPERATOR ACTION. (1.0)

QUESTION 2.11 (2.00)

- a. When, during a loss of Reactor Plant Component Cooling Water (CCP), should the reactor be scrammed? (1.0)
- b. Which one of the following loads will not be affected by a loss of CCP? (1.0)
 - 1. Drywell coolers
 - 2. Drywell equipment drain heat exchanger
 - 3. RWCU pump seal cooler
 - 4. RHR pump seal cooler

QUESTION 2.12 (2.00)

State the name of the radiation monitor (with automatic actions) that will alarm and the automatic action associated with that monitor if a fuel handling accident causing significant damage to a fuel bundle occurs in:

- a. Fuel Building (1.0)
- b. Containment (1.0)

QUESTION 2.13 (1.00)

Arrange the following four systems in order of preference for making up to the Upper Containment Pool if the leakage rate exceeds the sump capacity and a fuel bundle is not in a safe storage location: (1.0)

- a. HPCS injection
- b. Standby Service Water crosstie to FPC HX's
- c. Condensate System injection via Feedwater lines
- d. Standby Service Water via RHR B

QUESTION 2.14 (2.50)

State five (5) conditions requiring Emergency RPV Depressurization per the River Bend EOP's. (2.5)

QUESTION 2.15 (1.00)

List the three (3) injection systems that should be initiated prior to evacuating the control room during the implementation of AOP-0031, "Shutdown from Outside the Main Control Room." (1.0)

QUESTION 3.01 (1.00)

An event has occurred which has caused RPV level to decrease to 6", RPV pressure has reached 1075 psig, and drywell pressure has reached 1.2 psig. Which of the following correctly describes the status of the scram valve solenoids, the backup scram valve solenoids, and the ARI solenoids for the above conditions. No manual actions have been taken and the event occurred during power operation with the Mode Switch in RUN. (1.0)

- a. Scram solenoids deenergized, backup scram solenoids deenergized, ARI solenoids deenergized
- b. Scram solenoids deenergized, backup scram solenoids energized, ARI solenoids deenergized
- c. Scram solenoids deenergized, backup scram solenoids energized, ARI solenoids energized
- d. Scram solenoids energized, backup scram solenoids deenergized, ARI solenoids deenergized

QUESTION 3.02 (1.00)

The Alternate Rod Insertion logic is automatically actuated at the same setpoint as which one of the following: (1.0)

- a. Reactor scram
- b. Main Steam Line isolation
- c. Low Pressure Core Spray actuation
- d. ATWS trip of both Recirc pumps

QUESTION 3.03 (1.50)

For each of the following, state the normal power supply AND indicate whether the supply is safety-related or not: (1.5)

- a. Scram pilot valve solenoids
- b. Backup scram valve solenoids
- c. ARI valve solenoids

QUESTION 3.04 (4.00)

- a. List the setpoints for the RC&IS Low Power Setpoint (LPSP), Low Power Alarm Point (LPAP), and High Power Setpoint (HPSP). (1.5)
- b. What is the measured variable that determines these setpoints? (0.5)
- c. Describe the control function performed/changed by each setpoint (LPSP, HPSP) and alarm point (LPAP)? (1.5)
- d. What action must an operator take if a control rod is withdrawn in Operational Condition 1, one turbine bypass valve is 50% open and thermal power is greater than the LPSP? (0.5)

QUESTION 3.05 (2.50)

List five (5) controls available to the control room operator which would stop Recirculation Flow Control Valve movement if the valve starts to ramp open while operating in Loop Manual control. (2.5)

QUESTION 3.06 (1.50)

Name three (3) systems receiving inputs from the Containment and Reactor Vessel Isolation Control System (CRVICS) that have BYPASS SWITCHES associated with them that, if the switches are taken to BYPASS, will prevent automatic isolation of these systems. (1.5)

QUESTION 3.07 (0.50)

Which system covered by CRVICS will not isolate (neither inboard nor outboard) on a loss of one RPS bus? (0.5)

QUESTION 3.08 (2.00)

Match the combinations of armed and depressed containment isolation pushbuttons (a - f) with the expected isolations, if any, (1 - 4) resulting from that action. NOTE: MORE THAN ONE ISOLATION MAY APPLY. (2.0)

- | | | | |
|----|---------|----|-------------------|
| a. | A and B | 1. | Full MSIV closure |
| b. | B and C | 2. | BOP Inboard |
| c. | C and D | 3. | BOP Outboard |
| d. | A and C | 4. | No Isolation |
| e. | A and D | | |
| f. | B and D | | |

QUESTION 3.09 (3.50)

- a. What are three (3) components in the HPCS system that can be manually overridden and operated on P-601 with a HPCS initiation signal present? (1.5)
- b. Once HPCS has ceased injection due to a Level 8 signal, describe the two (2) methods by which injection may be restarted as level decreases. (2.0)

QUESTION 3.10 (1.00)

The reactor is operating at 5% power, 920 psig, with the Mode Switch in STARTUP, when the Reactor Level instrument selected for feedwater control fails downscale. Which one of the following actions/signals will NOT occur as a result of this failure? Assume no operator action. (1.0)

- a. Feedwater flow increases and the reactor trips on high reactor level.
- b. Feedwater flow increases and the reactor feedwater pumps trip on high reactor level.
- c. A recirculation flow control valve runback signal is generated.
- d. A signal to downshift the recirculation pumps to slow speed is generated.

QUESTION 3.11 (1.00)

Select the answer below that indicates how far above the top of the active fuel water level is maintained in automatic assuming normal system operation. (1.0)

- a. 213"
- b. 197"
- c. 172"
- d. 119"

QUESTION 3.12 (0.50)

Match the type of Division 1 Diesel Generator start (a) with the action necessary (1 - 3) to reinstate all protective trips on the machine. (0.5)

- | | |
|-----------------------------------|--|
| a. Manual Emergency Start (local) | 1. depressing the NORMAL START and EMERGENCY START pushbuttons |
| | 2. depressing only the NORMAL START pushbutton |
| | 3. diesel must be shutdown |

QUESTION 3.13 (1.00)

The reactor is operating at 100% power when a trip of both recirculation pumps occurs. With no operator action, which of the following is most likely to scram the reactor: (1.0)

- a. High reactor pressure
- b. MSIV isolation (low steam line pressure)
- c. High reactor level
- d. Flow biased thermal power

QUESTION 3.14 (1.50)

- a. At what point during a power escalation does the EOC-RPT become effective (include the sensed parameter)? (0.5)
- b. Why is the EOC-RPT necessary? (1.0)

QUESTION 3.15 (1.00)

Which combination of valve closures and actions below displays how the EOC-RPT logic functions: (1.0)

- a. one turbine stop valve and one control valve trip one recirculation pump
- b. two turbine stop valves trip one recirculation pump
- c. one turbine stop valve and one control valve trip both recirculation pumps
- d. two turbine stop valves trip both recirculation pumps

QUESTION 3.16 (1.50)

The reactor is operating at 100% with a RCIC flow surveillance in progress. RHR A is in suppression pool cooling with the following lineup:

- RHR Heat Exchanger Inlet and Outlet valves F003A and F0047A open fully
- RHR Heat Exchanger Bypass Valve F048A throttled to approximately mid-position
- RHR A Minimum Flow Valve F064A closed
- RHR Test Return to Suppression Pool Valve F024A open
- RHR pump suction from suppression pool F004A open
- RHR pump A outboard isolation valve F027A open
- RHR pump A injection isolation valve F042A shut
- RHR pump A running

A small steam leak occurs which causes ECCS initiation on high drywell pressure. RPV level is being controlled adequately by the feedwater level control system. DESCRIBE the changes that occur in the above lineup as a result (directly or indirectly) of the ECC actuation signal. (1.5)

QUESTION 3.17 (2.00)

- a. Assuming the MSIV Leakage Control System is in a normal standby lineup, what are three (3) actions/conditions that must be met for the system to begin automatic operation? INCLUDE VALUES AS APPLICABLE. (1.5)
- b. The Penetration Valve Leakage Control Air Compressors provide a backup air supply to what components? (0.5)

QUESTION 3.18 (1.00)

Normal water additions (< 1 foot) to either the upper or lower fuel pools should be made via: (1.0)

- a. water hose from CNS service box directly into the pool.
- b. the Fuel Pool Purification pump from the CST.
- c. the Fuel Pool Cooling pump from the CST.
- d. Purification or Cooling pump from the condensate system.

QUESTION 3.19 (2.50)

For each combination of Main Steam Line Radiation Monitor Trips (a - e), select the appropriate automatic action(s) (1 - 5). (2.5)

- | | |
|--|----------------------------------|
| a. Channel A High, Channel B High-High | 1. Half-scrum |
| b. Channel A High, Channel D High | 2. Scram |
| c. Channel B Downscale, Channel C Inop | 3. Mechanical Vacuum Pump A trip |
| d. Channel A Inop, Channel C High-High | 4. Mechanical Vacuum Pump B trip |
| e. Channel C Inop, Channel D High-High | 5. No Automatic Actions |

QUESTION 3.20 (1.00)

What are the power supplies to the Main Steam Line Radiation Monitoring System and the Off-Gas Radiation Monitoring System? (1.0)

QUESTION 3.21 (1.00)

Which one of the following conditions in the Stator Winding Cooling System WILL NOT initiate a turbine generator runback? (1.0)

- a. Stator winding cooling inlet low pressure
- b. Stator winding outlet water high temperature
- c. Stator winding cooling system low flow
- d. Stator winding cooling system high conductivity

QUESTION 3.22 (2.00)

The main generator is ready to be paralleled to the grid with the synchroscope rotating slowly in the "fast" direction.

- a. What does this synchroscope condition tell the operator about the relationship between the generator output and the grid? (1.0)
- b. What condition exists between the generator and the grid as the synchroscope passes through the "12 o'clock" position? (1.0)

QUESTION 3.23 (1.00)

Which one of the following steam flows is NEITHER indicated NOR included in indicated main steam flow in the control room? (1.0)

- a. Main steam line drain flow
- b. SRV flow
- c. RCIC flow
- d. RPV head vent

QUESTION 3.24 (1.00)

Which one of the following Main Steam Line components is designed to limit the differential pressure across the steam dryer assembly? (1.0)

- a. Main Steam Line flow elbows
- b. Main Steam Isolation Valves
- c. Main Steam Shutoff Valves
- d. Main Steam Line flow restrictors

QUESTION 3.25 (1.00)

List the OPERATIONAL CONDITIONS when a Reactor Operator may be designated to assume the control room command function. (1.0)

QUESTION 3.26 (2.00)

- a. How or where is it documented which individuals make up the Fire Brigade for a given shift? (0.5)
- b. Which five (5) personnel, by title or position, are specifically excluded from being on the Fire Brigade? (1.5)

QUESTION 3.27 (2.00)

- a. What two (2) conditions must an unlicensed individual meet before he/she is permitted to manipulate the controls that directly affect reactivity or power level of the reactor? (1.0)
- b. What requirement must a River Bend reactor operator licensee meet to maintain the license in an "active" status (in addition to maintaining a license in an "inactive" status) per 10 CFR 55? (0.5)
- c. What action must be taken to re-activate a RO license once it has been "inactive" (at River Bend) per 10 CFR 55? (0.5)

QUESTION 3.28 (1.50)

If air operated valves are to be used for equipment isolation (protective tagging), what action(s) must be taken on the valve, valve operator, and/or controls prior to beginning work? ADDRESS FAIL OPEN and FAIL CLOSED valves. (1.5)

QUESTION 3.29 (1.50)

What temperature and pressure conditions require the use of two closed valves between the work area and system conditions? (1.5)

QUESTION 3.30 (1.00)

Any individual or group of individuals permitted to enter High or Very High Radiation Areas must meet one of three monitoring requirements. State one of these three requirements. (1.0)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

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QUESTION 3.31 (1.00)

- a. What is the purpose of the 2000 series key added to the NEO and NCO rounds keys? (0.5)
- b. Whose approval is required prior to use of this key? (0.5)

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

1. REACTOR PRINCIPLES (7%) THERMODYNAMICS
(7%) AND COMPONENTS (11%) (FUNDAMENTALS EXAM)

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ANSWER 1.01 (0.00)

GENERIC FUNDAMENTALS EXAM

REFERENCE

GENERIC FUNDAMENTALS EXAM

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

ANSWER 2.01 (2.00)

- A scram setpoint is exceeded and an automatic scram did not occur (1.0)
- Plant conditions are approaching an unsafe condition and a manual reactor scram will mitigate the consequences of this condition (1.0)

REFERENCE

AOP-0001, Reactor Scram, Rev 4, pg 2
295006G011 4.3*/4.5*

295006G011 ..(KA's)

ANSWER 2.02 (2.00)

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

REFERENCE

AOP-0002, Main Turbine and Generator Trips, Rev 3, pg 3, 4
295005K101 4.0/4.1 295005K301 3.8/3.8

295005K101 295005K301 ..(KA's)

ANSWER 2.03 (2.00)

- core submergence (0.5) preferred (0.5)
- steam cooling with injection of makeup water to the RPV (0.5)
- steam cooling without injection of makeup water to the RPV (0.5)

REFERENCE

EOP Appendix B, Technical Bases for EOP Steps. Section 3, pg 6 of 191
295031A204 4.6*/4.8*

295031A204 ..(KA's)

2. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS
(27%)

ANSWER 2.04 (1.00)

c (1.0)

REFERENCE

EOP Appendix B, pg 91 of 191
295037K306 3.8/4.1

295037K306 ..(KA's)

ANSWER 2.05 (2.50)

- deenergize the scram solenoids
- vent the scram air header
- reset the scram, drain SDV, manually scram again
- individual scram switches to TEST
- increase CRD cooling water dp
- insert using CRDH
- vent CRD overpiston volume
- arm and depress ARI pushbuttons
{5 required at 0.5 each}

REFERENCE

EOP-1A, Appendix B, pg 94, 95
295037A105 3.9/4.0

295037A105 ..(KA's)

ANSWER 2.06 (0.50)

Use of a hydro pump (0.5)

REFERENCE

EOP-1A, Appendix B, pg 98
295037K213 3.4/4.1

295037K213 ..(KA's)

ANSWER 2.07 (2.50)

- a. Insert control rods to less than 80% rod line (0.3). Monitor APRM back panels for flux oscillations (0.3). If APRM oscillations are >25% peak to peak (0.3), and the magnitude is increasing (0.3), scram the reactor (0.3). Accepted actions per Rev 2, 3, or 4 of AOP-0024 due to the rapid number of revisions to the procedure.
- b. Plant Manager (0.5) or APM-0 in his absence
- c. thermal - hydraulic instabilities in the core (0.5)

REFERENCE

AOP-0024, Decrease in Recirculation System Flow Rate, Rev 2, pgs 2, 3
Standing Order #69, Operation With Single Loop Recirculation Flow
295001K103 3.6/4.1 295001G010 3.8*/3.7*

295001G010 295001K103 ..(KA's)

ANSWER 2.08 (2.00)

- a. Use the manual trip handle at the turbine front standard (1.0)
- b. Motoring of the generator (1.0) and subsequent turbine damage (0.5 if turbine damage is only response).

REFERENCE

AOP-0014, Loss of 125 VDC, Rev 3, pg 3
295004K105 3.3/3.4 295004A102 3.8/4.1

295004K105 295004A102 ..(KA's)

ANSWER 2.09 (1.00)

- a. RCIC (1.0)

REFERENCE

AOP-0050, Station Blackout, Rev 2, pg 11, 12

295003A103 4.4*/4.4* 295003G011 4.1*/4.3*

295003A103 295003G011 ..(KA's)

ANSWER 2.10 (2.00)

- a. increase - air inleakage (0.5)
 decrease - Off Gas System line blockage (0.5). Also accept closure of
 SJAE steam supply or regulator.
- b. 22.3" HG (0.5) due to the turbine trip (stop valve closure) (0.5)

REFERENCE

AOP-0005, Loss of Main Condenser Vacuum, Rev 3, pg 2

295002K201 3.5/3.5 295002K301 3.7/3.8 295002K207 3.1/3.1

295002K201 295002K301 295002K207 ..(KA's)

ANSWER 2.11 (2.00)

- a. When no CRD pumps are running (0.5) and >1 CRD accumulator trouble
 alarm is in (0.5).
- b. 1 (1.0)

REFERENCE

AOP-0011, Loss of Reactor Plant Component Cooling Water, Rev 3, pg 2, 3

295018K201 3.3/3.4 295018G010 3.4*/3.3*

295018G010 295018K201 ..(KA's)

ANSWER 2.12 (2.00)

- a. Fuel Building Effluent High Rad (0.2) isolates the Fuel Bldg normal supply and exhaust ventilation (0.4) and auto initiates the Fuel Bldg Exhaust Charcoal Filter Trains (0.4).
- b. Annulus Exhaust High Rad (0.2) auto starts Annulus Mixing System (0.4) and Standby Gas Treatment System (0.4).

REFERENCE

AOP-0027, Fuel Handling Mishaps, Rev 4, pg 2
295023K206 3.4/3.8 295023K203 3.4/3.6

295023K203 295023K206 ..(KA's)

ANSWER 2.13 (1.00)

- c, a, d, b (0.33 for each manipulation to put in the correct order)

REFERENCE

AOP-0027, Fuel Handling Mishaps, Rev 4, pg 3
295023K202 2.9/3.2

295023K202 ..(KA's)

ANSWER 2.14 (2.50)

[5 required at 0.5 each]

1. Containment to annulus dp >5 psid
2. Containment temperature >185 deg F
3. Drywell temperature >330 deg F
4. Reactor pressure and Suppression Pool temperature cannot be maintained in the safe zone of the appropriate figure
5. Suppression pool level and delta THC cannot be maintained in the safe zone of the appropriate figure
6. Suppression pool level and reactor pressure cannot be maintained in the safe zone of the appropriate figure
7. A primary system is discharging into secondary containment and any area temperature, area radiation level, or area water level exceeding its maximum safe operating value in more than one area of the appropriate table
8. Offsite release rates requiring a General Emergency with a primary system discharging outside primary and secondary containments

REFERENCE

EOP-1

2950286012 3.8*/4.3* 2950296012 3.6/4.4*

2950286012 2950296012 ..(KA's)

ANSWER 2.15 (1.00)

HPCS, LPCS, RCIC (0.33 each)

REFERENCE

AOP-0031, Shutdown from Outside the Main Control Room, Rev 5, pg 5

2950166010 3.8*/3.6*

2950166010 ..(KA's)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

ANSWER 3.01 (1.00)

b (1.0)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 5 - 7
201001K404 3.6/3.6
201001A204 3.8/3.9

201001K404 201001A204 ..(KA's)

ANSWER 3.02 (1.00)

d (1.0)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 2
212000K401 3.4/3.6

212000K401 ..(KA's)

ANSWER 3.03 (1.50)

- a. RPS MG sets (accept 125 VAC) (0.25) non-safety (0.25)
- b. 125 VDC (0.25) safety related (0.25)
- c. 125 VDC (0.25) non-safety related (0.25)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 2, 4, 9
LOTM-56-2, AC Distribution
LOTM-57-2, DC Distribution
201001K202 3.6*/3.7 201001K203 3.5*/3.6* 201001K205 4.5*/4.5*

201001K202 201001K203 201001K205 ..(KA's)

ANSWER 3.04 (4.00)

- a. LPSP 27.5% reactor power (or 157.6 psig 1st stage turbine pressure)
HPSP 62.5% reactor power (or 410.7 psig 1st stage turbine pressure)
LPAP 37.5% reactor power (or 220.6 psig 1st stage turbine pressure)
- b. turbine first stage pressure (0.5)
- c. LPSP: Below the LPSP, the Rod Pattern Control System imposes restrictions on rod movements with regard to rod pattern (0.5). Above the LPSP, the Rod Withdrawal Limiter limits the number of notches a control rod may be withdrawn (0.25) to 4 (0.25).

HPSP: Above the HPSP, the Rod Withdrawal Limiter limits the number of notches a control rod may be withdrawn (0.25) to 2 (0.25).

LPAP: No control function, indication only.
- d. Immediately return the control rod to the position prior to the withdrawal (0.5)

REFERENCE

LOTM-6-2, Rod Control and Information System, pg 14
River Bend Technical Specification 3.1.4.1
201005K102 3.3/3.5 201005K507 3.5/3.5 201005K509 3.5/3.5 201005K510 3.2/3.3
201005A101 3.2/3.3 201005G014 3.5/3.8

201005A101 201005K102 201005G014 201005K507 201005K509
201005K510 ..(KA's)

ANSWER 3.05 (2.50)

1. Shutdown the HPU using the manual pushbutton at H13-P680
2. Shutdown the HPU using the shutdown pushbutton at H13-P614
3. Shutdown the HPU at H13-P614 by placing both subloops in Maintenance
4. Shut the drywell isolation valves at H13-P808
5. Depress the Drywell Pressure Test pushbutton at H13-P614
6. Depress the CRVICS BOP pushbuttons on the H13-P680 panel
(5 required at 0.5 each)

REFERENCE

LOTM-8-2, Recirculation Flow Control, pgs 5 - 8, Figure 4
202002A402 2.8/2.8

202002A402 ..(KA's)

ANSWER 3.06 (1.50)

1. RWCU (0.5)
2. RCIC (0.5)
3. RHR (0.5)

REFERENCE

LOTM-51-2, CRVICS, pg 21
223002G007 3.8/3.9

223002G007 ..(KA's)

ANSWER 3.07 (0.50)

Main Steam (0.5)

REFERENCE

LOTM-51-2, CRVICS, pgs 3 - 5
223002K608 3.5/3.7 223002A201 3.2/3.5

223002A201 223002K608 ..(KA's)

ANSWER 3.08 (2.00)

- a. 1 (MSIV)
 - b. 1, 2 (Inboard)
 - c. 1
 - d. 4 (no isolation)
 - e. 1, 3 (outboard)
 - f. 4
- (8 at 0.25 each)

REFERENCE

LOTM-51-2, CRVICS, Figure 13
223002A402 3.9/3.8

223002A402 ..(KA's)

ANSWER 3.09 (3.50)

- a. F004 HPCS Injection Valve (0.5)
F015 Suppression Pool Suction Valve (0.5)
HPCS Pump (0.5)
- b. 1. Level decreases to Level 2 (1.0) and the system automatically restarts.
- 2. High Level 8 signal is reset by the operator (1.0) after the level decreases to below the level 8 setpoint.

REFERENCE

LOTM-18-2, HPCS, pg 8
209002A305 3.7/3.7 209002A401 3.7/3.7 209002A402 3.6/3.6 209002A403 3.8/3.8

209002A305 209002A401 209002A402 209002A403 ..(KA's)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

ANSWER 3.10 (1.00)

a (1.0)

REFERENCE

LOTM-34-2, Feedwater Level Control System, Figure 1
259002K302 3.7/3.7 259002K304 2.9/3.0 259002K305 2.8/2.9

259002K302 259002K304 259002K305 ..(KA's)

ANSWER 3.11 (1.00)

b (1.0)

REFERENCE

LOTM-3-2, Nuclear Boiler Process Instrumentation, Figure 1
216000K122 3.6/3.8

216000K122 ..(KA's)

ANSWER 3.12 (0.50)

a. 1 (0.5)

REFERENCE

LOTM-58-2, Standby Diesel Generators and Auxiliaries, pg 16 - 17
264000K401 3.5/3.7 264000K402 4.0/4.2

264000K401 264000K402 ..(KA's)

ANSWER 3.13 (1.00)

d (1.0) also accept c

REFERENCE

LOTM-7-2, Recirculation System, pg 21
202001A204 3.7/3.8

202001A204 ..(KA's)

ANSWER 3.14 (1.50)

- a. 40% (0.25) by turbine first stage pressure (0.25)
- b. During the first part of a scram at the end of cycle, the control rods cannot insert negative reactivity as fast as the collapsing voids can insert positive reactivity (1.0) due to the sudden decrease in steam flow due to a turbine trip or control valve fast closure.

REFERENCE

LOTM-7-2, Recirculation System, pg 12
202001K104 3.3/3.3 202001K505 3.5/3.6

202001K104 202001K505 ..(KA's)

ANSWER 3.15 (1.00)

- b (1.0)

REFERENCE

LOTM-7-2, Recirculation System, pg 12
202001K128 3.9/4.1

202001K128 ..(KA's)

ANSWER 3.16 (1.50)

- HX BPV F048 opens fully (0.5)
- RHR Test Return to SP F024 shuts (0.5)
- Minimum Flow Valve F064 opens (0.5)

REFERENCE

LOTM-19-2, RHR, pgs 7, Table 5
219000A406 3.9/3.7

219000A406 ..(KA's)

ANSWER 3.17 (2.00)

- a. - OPERATE SWITCH to OPERATE (0.5) for each subsystem.
- Reactor Pressure < 25 psig (0.5)
- PVLCS air pressure > 50 psig (0.5)
- b. SRVs (0.5)

REFERENCE

LOTM-52-2, Penetration Valve and MSIV Leakage Control Systems, pg 5, Fig 1
239003A301 3.0/2.8 239003K101 3.3/3.4

239003K101 239003A301 ..(KA's)

ANSWER 3.18 (1.00)

- a (1.0)

REFERENCE

SOP-0091, Fuel Pool Cooling and Cleanup System, Rev 5, pg 39
233000K406 2.9/3.2

233000K406 ..(KA's)

ANSWER 3.19 (2.50)

- a. 1, 4
- b. 5
- c. 1, 3
- d. 1, 3
- e. 2, 3, 4
(10 at 0.25 each)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (10%)

REFERENCE

LOTM-66-2, Process Radiation Monitoring, pg 4
272000K402 3.7/4.1 272000A206 2.8/2.9

272000K402 272000A206 ..(KA's)

ANSWER 3.20 (1.00)

MSL Rad Monitors - RPS (0.5)
Off-Gas Monitors - 125 VDC (0.5)

REFERENCE

LOTM-66-2, Process Radiation Monitoring System
272000K201 2.5/2.8 272000K202 2.5/2.8

272000K201 272000K202 ..(KA's)

ANSWER 3.21 (1.00)

d (1.0)

REFERENCE

LOTM-55-2, Main Generator Auxiliaries, pg 3
245000K605 2.9/2.9

245000K605 ..(KA's)

ANSWER 3.22 (2.00)

- a. That the generator frequency is slightly higher than the grid frequency (1.0).
- b. That the generator frequency and grid frequency are in phase (1.0).

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

REFERENCE

LOTM-54-2, Generator Exciter and Voltage Regulator, pg 12
245000K507 2.6/2.9

245000K507 ..(KA's)

ANSWER 3.23 (1.00)

c (1.0)

REFERENCE

LOTM-24-2, Main Steam, Figure 1
239001K119 3.1/3.2

239001K119 ..(KA's)

ANSWER 3.24 (1.00)

d (1.0)

REFERENCE

LOTM-24-2, Main Steam, pg 7
239001K404 3.4/3.5

239001K404 ..(KA's)

ANSWER 3.25 (1.00)

Operational Conditions 4 and 5 (0.5 each)

REFERENCE

RBS Technical Specifications Table 6.2.2-1
294001A103 2.7/3.7

294001A103 ..(KA's)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

ANSWER 3.26 (2.00)

- a. Control room log book (0.5)
- b. SS, COF, STA, ATC Operator, 1 NEO (0.3 each)

REFERENCE

ADM-0022, Conduct of Operations, Rev 11, pg 11 - 12
294001K116 3.5/3.8

294001K116 ..(KA's)

ANSWER 3.27 (2.00)

- a. - Under the direct supervision of a licensed individual (0.5)
- Enrolled in approved operator licensing training class (0.5)
- b. Stand a minimum of seven 8 hour shifts or five 12 hour shifts per calendar quarter performing the functions of the license (0.5)
- c. Complete 40 hours under instruction at the position for which the re-activation is sought (0.5).

REFERENCE

RBS ADM-0022, Conduct of Operations, Rev 11, pg 14
10 CFR 55.53(e) and (f)(2)
294001A103 2.7/3.7

294001A103 ..(KA's)

ANSWER 3.28 (1.50)

- Fail Closed: Should have the air and or power removed (0.5), and the control switch in the closed position (0.5).
- Fail Open: Valve should be gagged or a blocking device installed to ensure the valve stays shut (0.5)

REFERENCE

ADM-0027, Protective Tagging, Rev 7, pg 5
294001K102 3.9/4.5*

294001K102 ..(KA's)

ANSWER 3.29 (1.50)

50 psig or 200 deg F (0.75 each)

REFERENCE

ADM-0027, Protective Tagging, Rev 7, pg 6
294001K108 3.1/3.4 294001K109 3.4/3.8

294001K108 294001K109 ..(KA's)

ANSWER 3.30 (1.00)

- A radiation monitoring device which continuously indicates the dose-rate in the area.
 - A dose integrating monitor which is set to alarm when a preset dose is received.
 - Accompanied by an individual qualified in radiation protection procedures, with a dose-rate monitoring device.
- (1 of 3 at 1.0)

REFERENCE

RSP-0200, Radiation Work Permits, Rev 4, pg 11
294001K103 3.3/3.8

294001K103 ..(KA's)

ANSWER 3.31 (1.00)

- a. 2000 series key is a valve lock master (0.5)
- b. Shift Supervisor (0.5)

3. PLANT SYSTEMS (38%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (10%)

REFERENCE

Standing Order #63, June 1, 1988
294001K105 3.2/3.7

294001K105 ..(KA's)

TEST CROSS REFERENCE

Page 1

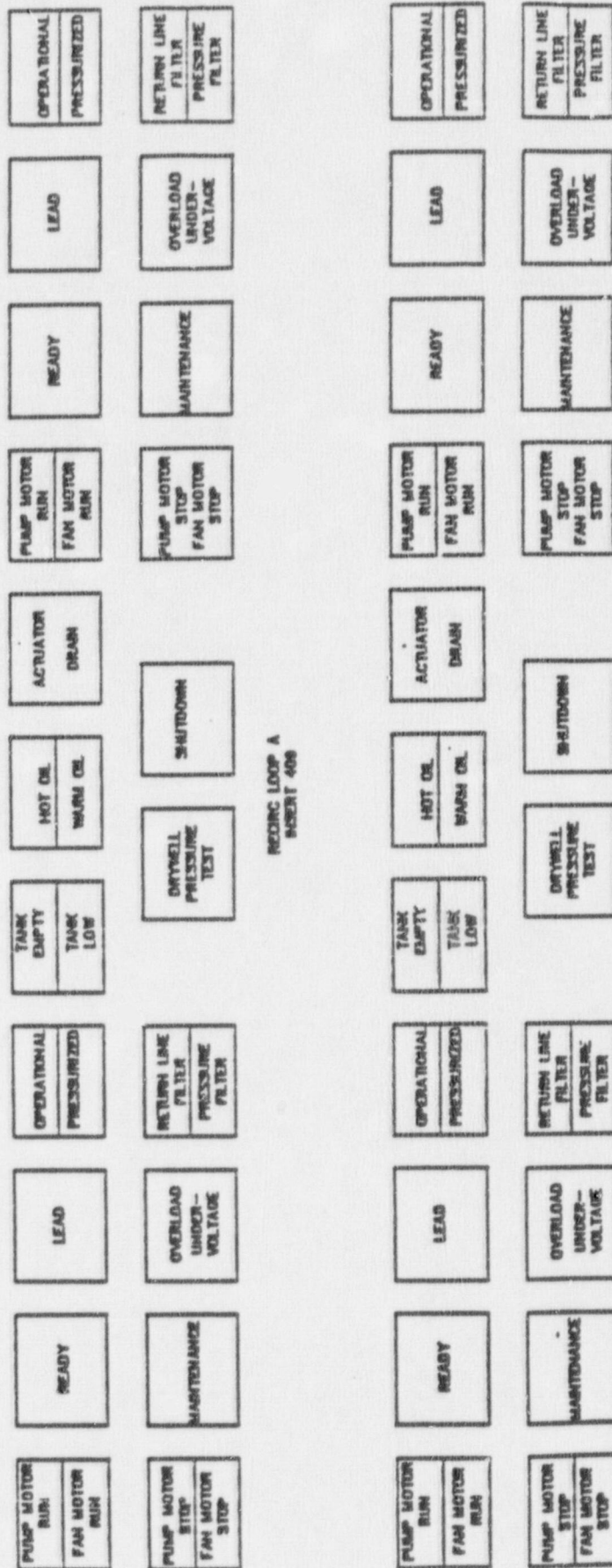
QUESTION	VALUE	REFERENCE
1.01	0.00	9000138
1.02	25.00	-----

	25.00	
2.01	2.00	9000082
2.02	2.00	9000083
2.03	2.00	9000084
2.04	1.00	9000085
2.05	2.50	9000086
2.06	0.50	9000087
2.07	2.50	9000088
2.08	2.00	9000089
2.09	1.00	9000090
2.10	2.00	9000091
2.11	2.00	9000092
2.12	2.00	9000093
2.13	1.00	9000094
2.14	2.50	9000095
2.15	1.00	9000096

	26.00	
3.01	1.00	9000049
3.02	1.00	9000050
3.03	1.50	9000051
3.04	4.00	9000053
3.05	2.50	9000054
3.06	1.50	9000055
3.07	0.50	9000056
3.08	2.00	9000057
3.09	3.50	9000058
3.10	1.00	9000059
3.11	1.00	9000060
3.12	0.50	9000061
3.13	1.00	9000062
3.14	1.50	9000063
3.15	1.00	9000064
3.16	1.50	9000065
3.17	2.00	9000066
3.18	1.00	9000067
3.19	2.50	9000068
3.20	1.00	9000069
3.21	1.00	9000070
3.22	2.00	9000071
3.23	1.00	9000072
3.24	1.00	9000073
3.25	1.00	9000074
3.26	2.00	9000075
3.27	2.00	9000076
3.28	1.50	9000077
3.29	1.50	9000078
3.30	1.00	9000079
3.31	1.00	9000080

46.59

97.50



RECIRC LOOP B
RESET 408

Figure 4

RECIRCULATION FLOW CONTROL SYSTEM INDICATIONS: PANEL P614

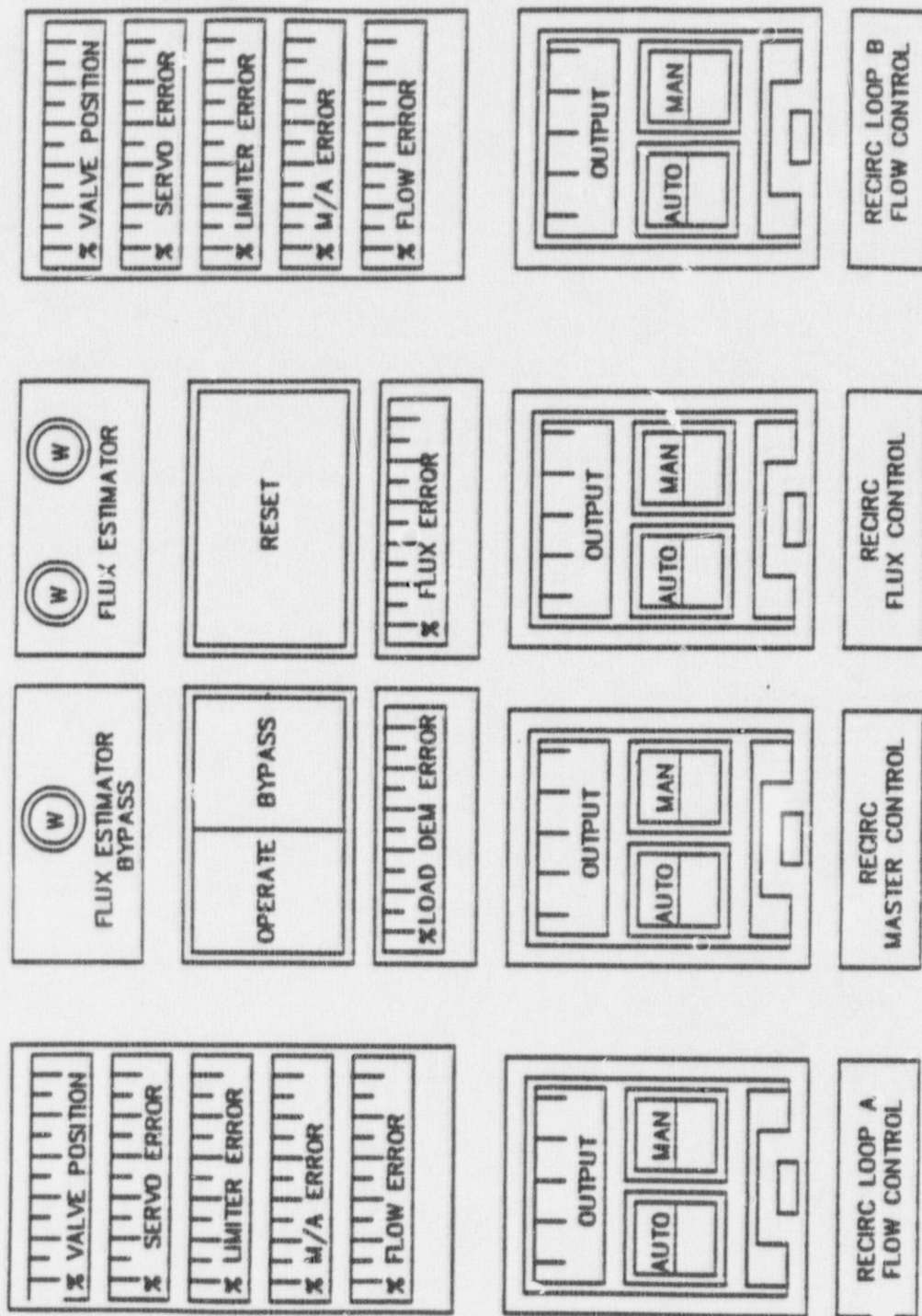


Figure 7

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

FACILITY: River Bend 1
 REACTOR TYPE: BWR-6E6
 DATE ADMINSTERED: 89/02/14

INSTRUCTIONS TO CANDIDATE:

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

CATEGORY	% OF TOTAL	CANDIDATE'S SCORE	% OF CATEGORY VALUE	CATEGORY
24.00	24.62		4.	REACTOR PRINCIPLES (7%) THERMODYNAMICS (7%) AND COMPONENTS (10%) (FUNDAMENTALS EXAM)
32.00	32.82		5.	EMERGENCY AND ABNORMAL PLANT EVOLUTIONS (33%)
41.50	42.56		6.	PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC RESPONSIBILITIES (13%)
97.50			%	TOTALS
				FINAL GRADE

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

 Candidate's Signature

NRC RULES AND GUIDELINES FOR LICENSE EXAMINATIONS

During the administration of this examination the following rules apply:

1. Cheating on the examination means an automatic denial of your application and could result in more severe penalties.
2. 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.
3. Use black ink or dark pencil only to facilitate legible reproductions.
4. Print your name in the blank provided on the cover sheet of the examination.
5. Fill in the date on the cover sheet of the examination (if necessary).
6. Use only the paper provided for answers.
7. Print your name in the upper right-hand corner of the first page of each section of the answer sheet.
8. Consecutively number each answer sheet, write "End of Category __" as appropriate, start each category on a new page, write only on one side of the paper, and write "Last Page" on the last answer sheet.
9. Number each answer as to category and number, for example, 1.4, 6.3.
10. Skip at least three lines between each answer.
11. Separate answer sheets from pad and place finished answer sheets face down on your desk or table.
12. Use abbreviations only if they are commonly used in facility literature.
13. The point value for each question is indicated in parentheses after the question and can be used as a guide for the depth of answer required.
14. Show all calculations, methods, or assumptions used to obtain an answer to mathematical problems whether indicated in the question or not.
15. Partial credit may be given. Therefore, ANSWER ALL PARTS OF THE QUESTION AND DO NOT LEAVE ANY ANSWER BLANK.
16. If parts of the examination are not clear as to intent, ask questions of the examiner only.
17. You must sign the statement on the cover sheet that indicates that the work is your own and you have not received or been given assistance in completing the examination. This must be done after the examination has been completed.

18. When you complete your examination, you shall:

a. Assemble your examination as follows:

(1) Exam questions on top.

(2) Exam aids - figures, tables, etc.

(3) Answer pages including figures which are part of the answer.

b. Turn in your copy of the examination and all pages used to answer the examination questions.

c. Turn in all scrap paper and the balance of the paper that you did not use for answering the questions.

d. Leave the examination area, as defined by the examiner. If after leaving, you are found in this area while the examination is still in progress, your license may be denied or revoked.

4. REACTOR PRINCIPLES (7%) THERMODYNAMICS
(7%) AND COMPONENTS (10%) (FUNDAMENTALS EXAM)

Page 4

QUESTION 4.01 (24.0)

GENERIC FUNDAMENTALS EXAM

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

QUESTION 5.01 (2.00)

The automatic actions listed for a main turbine and generator trip per AOP-0002, "Main Turbine and Generator Trips", include reactor scrams. For parts "a" and "b" below select the answer from items 1 - 4 that will initiate the reactor scram.

- a. The turbine trips from 15% reactor power (1.0)
1. Main turbine stop valve position
 2. Turbine control valve position
 3. Reactor vessel level
 4. APRM
- b. The turbine trips from 45% reactor power (1.0)
1. Main turbine stop valve position
 2. Turbine control valve position
 3. Reactor vessel level
 4. APRM

QUESTION 5.02 (2.00)

River Bend EOP's acknowledge three viable mechanisms of adequate core cooling. List the three mechanisms, INCLUDING which one is preferred.(2.0)

QUESTION 5.03 (1.00)

A scram condition exists (MSIVs shut) with the reactor at power. The reactor did not shutdown. Core cooling is adequate. Which concern below is being most severely challenged in this condition? (1.0)

- a. fuel integrity
- b. RPV integrity
- c. containment integrity
- d. injection system operability

QUESTION 5.04 (2.50)

If the control rods fail to insert when required on a scram, state FIVE (5) methods that may be tried to obtain control rod insertion per EOP-1A. (2.5)

QUESTION 5.05 (0.50)

If boron injection is required and SLC is not available, what is the most reliable alternate method of injecting boron at River Bend? (0.5)

QUESTION 5.06 (2.50)

The reactor is operating at 100% when one recirculation pump trips due to an electrical fault.

- a. What immediate actions are required per AOP-0024, "Decrease in Recirculation System Flow Rate"? Include any conditional actions, (i.e. If ..., then ...) and applicable values. (1.5)
- b. Even though Technical Specifications allow for operation of the plant in single loop, what additional authorization is required? (0.5)
- c. What is the main operational concern due to a loss of forced recirculation through the core? (0.5)

QUESTION 5.07 (2.00)

- a. A loss of 125 VDC has occurred. How should the main turbine be tripped if the trip pushbutton on the EPC panel does not function? (1.0)
- b. If the loss of DC involved control power to the main generator output breakers, what negative consequence would occur as a result of tripping the main turbine? (1.0)

QUESTION 5.08 (1.00)

- a. During a station blackout (loss of all AC, including EOGs), what is the only system capable of injecting into the RPV? (1.0)

QUESTION 5.09 (2.00)

- a. When, during a loss of Reactor Plant Component Cooling Water (CCP), should the reactor be scrammed? (1.0)
- b. Which one of the following loads will not be affected by a loss of CCP? (1.0)
1. Drywell coolers
 2. Drywell equipment drain heat exchanger
 3. RWCU pump seal cooler
 4. RHR pump seal cooler

QUESTION 5.10 (1.00)

Arrange the following four systems in order of preference for making up to the Upper Containment Pool if the leakage rate exceeds the sump capacity and a fuel bundle is not in a safe storage location: (1.0)

- a. HPCS injection
- b. Standby Service Water crosstie to FPC HX's
- c. Condensate System injection via Feedwater lines
- d. Standby Service Water via RHR B

QUESTION 5.11 (2.50)

State five (5) conditions requiring Emergency RPV Depressurization per the River Bend EOP's. (2.5)

QUESTION 5.12 (1.00)

List the three (3) injection systems that should be initiated prior to evacuating the control room during the implementation of AOP-0031, "Shutdown from Outside the Main Control Room." (1.0)

QUESTION 5.13 (1.00)

What is the meaning of the red border around a decision step in the EOP's as compared to a decision step that is not red coded? (1.0)

QUESTION 5.14 (2.00)

During the use of the EOP's, what function/position is assumed by the:

- a. COF (1.0)
- b. SS (1.0)

QUESTION 5.15 (1.00)

What is the most important "ingredient" to successful or efficient use of the EOP's per OSP-0009, "Author's Guide/Control and Use of Emergency Operating Procedures?" (1.0)

QUESTION 5.16 (1.50)

With the reactor in a failure-to-scrum condition, what are three (3) actions taken, other than attempting to insert control rods, that attempt to reduce reactor power by insertion of negative reactivity? (1.5)

QUESTION 5.17 (1.00)

If it is decided that the MSIV's must be reopened to facilitate heat removal from the reactor under emergency conditions, and they have automatically shut, a procedure exists for bypassing a portion of the automatic closure logic. Which automatic closure signal below is bypassed by this procedure? (1.0)

- a. Low reactor level
- b. High main steam line flow
- c. Main steam line high radiation
- d. Main steam line tunnel high temperature

QUESTION 5.18 (1.50)

Decreasing instrument air header pressure has been observed and a Gaitrionics announcement to cease non-essential use of air has been made. What three (3) conditions require a reactor scram to be manually initiated per AOP-0008, "Loss of Instrument Air?" (1.5)

QUESTION 5.19 (1.00)

Which one of the following will occur as a result of a loss of Instrument Air? (1.0)

- 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

QUESTION 5.20 (1.00)

Why is it necessary to scram the reactor on a loss of service water if the main turbine is on the line? (1.0)

QUESTION 5.21 (1.50)

Fill in the blanks below concerning reactor power estimation using SRV's: Decay heat six minutes after a scram (from full power) is approximately ___(a)___% power which will require ___(b)___ SRV(s) to be cycling. If the number of SRV's cycling is too large, indicating reactor power too high, proceed to ___(c)___ (procedure name or number). (1.5)

5. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS
(33%)

QUESTION 5.22 (0.50)

Where do control room personnel assemble following a control room evacuation per AOP-0031, "Shutdown From Outside the Control Room?" (0.5)

QUESTION 6.01 (1.00)

An event has occurred which has caused RPV level to decrease to 6", RPV pressure has reached 1075 psig, and drywell pressure has reached 1.2 psig. Which of the following correctly describes the status of the scram valve solenoids, the backup scram valve solenoids, and the ARI solenoids for the above conditions. No manual actions have been taken and the event occurred during power operation with the Mode Switch in RUN. (1.0)

- a. Scram solenoids deenergized, backup scram solenoids deenergized, ARI solenoids deenergized
- b. Scram solenoids deenergized, backup scram solenoids energized, ARI solenoids deenergized
- c. Scram solenoids deenergized, backup scram solenoids energized, ARI solenoids energized
- d. Scram solenoids energized, backup scram solenoids deenergized, ARI solenoids deenergized

QUESTION 6.02 (1.00)

The Alternate Rod Insertion logic is automatically actuated at the same setpoint as which one of the following: (1.0)

- a. Reactor scram
- b. Main Steam Line isolation
- c. Low Pressure Core Spray actuation
- d. ATWS trip of both Recirc pumps

QUESTION 6.03 (1.50)

For each of the following, state the normal power supply AND indicate whether the supply is safety-related or not: (1.5)

- a. Scram pilot valve solenoids
- b. Backup scram valve solenoids
- c. ARI valve solenoids

QUESTION 6.04 (1.00)

Placing the "A" and "B" switches on a control rod's HCU to the TEST position performs which one of the following functions on that control rod/HCU: (1.0)

- a. Deenergizes the scram pilot solenoids for that control rod
- b. Bypasses the A and/or B RPIS data for that rod
- c. Energizes the selected directional control solenoid valve(s)
- d. Shuts the selected stabilizing valve(s)

QUESTION 6.05 (4.00)

- a. List the setpoints for the RC&IS Low Power Setpoint (LPSP), Low Power Alarm Point (LPAP), and High Power Setpoint (HPSP). (1.5)
- b. What is the measured variable that determines these setpoints? (0.5)
- c. Describe the control function performed/changed by each setpoint (LPSP, HPSP) and alarm point (LPAP)? (1.5)
- d. What action must an operator take if a control rod is withdrawn in Operational Condition 1, one turbine bypass valve is 50% open and thermal power is greater than the LPSP? (0.5)

QUESTION 6.06 (2.50)

List five (5) controls available to the control room operator which would stop Recirculation Flow Control Valve movement if the valve starts to ramp open while operating in Loop Manual control. (2.5)

QUESTION 6.07 (1.50)

Name three (3) systems receiving inputs from the Containment and Reactor Vessel Isolation Control System (CRVICS) that have BYPASS SWITCHES associated with them that, if the switches are taken to BYPASS, will prevent automatic isolation of these systems. (1.5)

QUESTION 6.08 (0.50)

Which system covered by CRVICS will not isolate (neither inboard nor outboard) on a loss of one RPS bus? (0.5)

QUESTION 6.09 (3.50)

- a. What are three (3) components in the HPCS system that can be manually overridden and operated on P-601 with a HPCS initiation signal present? (1.5)
- b. Once HPCS has ceased injection due to a Level 8 signal, describe the two (2) methods by which injection may be restarted as level decreases. (2.0)

QUESTION 6.10 (1.00)

The reactor is operating at 5% power, 920 psig, with the Mode Switch in STARTUP, when the Reactor Level instrument selected for feedwater control fails downscale. Which one of the following actions/signals will NOT occur as a result of this failure? Assume no operator action. (1.0)

- a. Feedwater flow increases and the reactor trips on high reactor level.
- b. Feedwater flow increases and the reactor feedwater pumps trip on high reactor level.
- c. A recirculation flow control valve runback signal is generated.
- d. A signal to downshift the recirculation pumps to slow speed is generated.

QUESTION 6.11 (1.00)

Select the answer below that indicates how far above the top of the active fuel water level is maintained in automatic assuming normal system operation. (1.0)

- a. 213"
- b. 197"
- c. 172"
- d. 119"

QUESTION 6.12 (0.50)

Match the type of Division 1 Diesel Generator start (a) with the action necessary (1 - 3) to reinstate all protective trips on the machine. (0.5)

- | | |
|-----------------------------------|--|
| a. Manual Emergency Start (local) | 1. depressing the NORMAL START and EMERGENCY START pushbuttons |
| | 2. depressing only the NORMAL START pushbutton |
| | 3. diesel must be shutdown |

QUESTION 6.13 (1.50)

- a. At what point during a power escalation does the EOC-RPT become effective (include the sensed parameter)? (0.5)
- b. Why is the EOC-RPT necessary? (1.0)

QUESTION 6.14 (2.00)

- a. Assuming the MSIV Leakage Control System is in a normal standby lineup, what are three (3) actions/conditions that must be met for the system to begin automatic operation? INCLUDE VALUES AS APPLICABLE. (1.5)
- b. The Penetration Valve Leakage Control Air Compressors provide a backup air supply to what components? (0.5)

QUESTION 6.15 (1.00)

Normal water additions (< 1 foot) to either the upper or lower fuel pools should be made via: (1.0)

- a. water hose from CNS service box directly into the pool.
- b. the Fuel Pool Purification pump from the CST.
- c. the Fuel Pool Cooling pump from the CST.
- d. Purification or Cooling pump from the condensate system.

QUESTION 6.16 (1.00)

What are the power supplies to the Main Steam Line Radiation Monitoring System and the Off-Gas Radiation Monitoring System? (1.0)

QUESTION 6.17 (1.00)

Which one of the following conditions in the Stator Winding Cooling System WILL NOT initiate a turbine generator runback? (1.0)

- a. Stator winding cooling inlet low pressure
- b. Stator winding outlet water high temperature
- c. Stator winding cooling system low flow
- d. Stator winding cooling system high conductivity

QUESTION 6.18 (2.00)

The main generator is ready to be paralleled to the grid with the synchroscope rotating slowly in the "fast" direction.

- a. What does this synchroscope condition tell the operator about the relationship between the generator output and the grid? (1.0)
- b. What condition exists between the generator and the grid as the synchroscope passes through the "12 o'clock" position? (1.0)

QUESTION 6.19 (1.00)

Which one of the following steam flows is NEITHER indicated NOR included in indicated main steam flow in the control room? (1.0)

- a. Main steam line drain flow
- b. SRV flow
- c. RCIC flow
- d. RPV head vent

QUESTION 6.20 (1.00)

Which one of the following Main Steam Line components is designed to limit the differential pressure across the steam dryer assembly? (1.0)

- a. Main Steam Line flow elbows
- b. Main Steam Isolation Valves
- c. Main Steam Shutoff Valves
- d. Main Steam Line flow restrictors

QUESTION 6.21 (1.00)

Where would one find a list of licensed individuals that requires the presence of an additional licensed individual while performing licensed duties as the ATC operator? (1.0)

QUESTION 6.22 (1.00)

List the OPERATIONAL CONDITIONS when a Reactor Operator may be designated to assume the control room command function. (1.0)

QUESTION 6.23 (1.50)

If air operated valves are to be used for equipment isolation (protective tagging), what action(s) must be taken on the valve, valve operator, and/or controls prior to beginning work? ADDRESS FAIL OPEN and FAIL CLOSED valves. (1.5)

QUESTION 6.24 (1.50)

What temperature and pressure conditions require the use of two closed valves between the work area and system conditions? (1.5)

QUESTION 6.25 (2.00)

Any individual or group of individuals permitted to enter High or Very High Radiation Areas must meet one of three monitoring requirements. State TWO of these three requirements. (2.0)

QUESTION 6.26 (2.00)

If a General Emergency is declared, what offsite protective actions shall be recommended immediately? (2.0)

QUESTION 6.27 (1.00)

Protective action recommendations for the general public shall be made by
the: (1.0)

- a. Recovery Manager
- b. Shift Supervisor
- c. Emergency Director
- d. Plant Manager

QUESTION 6.28 (1.00)

The protective action recommendations made by Gulf States personnel shall
be made directly to: (1.0)

- a. NRC Operations Center
- b. Louisiana Office of Emergency Preparedness
- c. Louisiana Nuclear Energy Division
- d. Appropriate Parish authorities

QUESTION 6.29 (1.00)

Certain individuals or groups control access to various plant areas by
controlling issuance of keys. For each of the following items (a - d),
indicate which individual/group (1 - 3) controls key issuance for
access to those areas. (1.0)

- | | |
|------------------------------|---|
| a. High Radiation Areas | 1. SS/COF |
| b. Very High Radiation Areas | 2. Senior Radiation Protection Technician |
| c. Radiation Exclusion Area | 3. Security |
| d. Locked valves | |

4. REACTOR PRINCIPLES (7%) THERMODYNAMICS
(7%) AND COMPONENTS (10%) (FUNDAMENTALS EXAM)

ANSWER 4.01 (24.0)

GENERIC FUNDAMENTALS EXAM

REFERENCE

GENERIC FUNDAMENTALS EXAM

5. EMERGENCY AND ABNORMAL PLANT EVOLUTIONS
[333]

ANSWER 5.01 (2.00)

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

REFERENCE

AOP-0002, Main Turbine and Generator Trips, Rev 3, pg 3, 4
295005K101 4.0/4.1 295005K301 3.8/3.8

295005K301 295005K101 ..(KA's)

ANSWER 5.02 (2.00)

- core submergence [0.5] preferred [0.5]
- steam cooling with injection of makeup water to the RPV [0.5]
- steam cooling without injection of makeup water to the RPV [0.5]

REFERENCE

EOP Appendix B, Technical Bases for EOP Steps, Section 3, pg 6 of 191
295031A204 4.6*/4.8*

295031A204 ..(KA's)

ANSWER 5.03 (1.00)

- c (1.0)

REFERENCE

EOP Appendix B, pg 91 of 191
295037K306 3.8/4.1

295037K306 ..(KA's)

ANSWER 5.04 (2.50)

- deenergize the scram solenoids
- vent the scram air header
- reset the scram, drain SDV, manually scram again
- individual scram switches to TEST
- increase CRD cooling water dp
- insert using CRDH
- vent CRD overpiston volume
- arm and depress ARI pushbuttons
(5 required at 0.5 each)

REFERENCE

EOP-1A, Appendix B, pg 94, 95
295037A105 3.9/4.0

295037A105 ..(KA's)

ANSWER 5.05 (0.50)

Use of a hydro pump (0.5)

REFERENCE

EOP-1A, Appendix B, pg 98
295037K213 3.4/4.1

295037K213 ..(KA's)

ANSWER 5.06 (2.50)

- a. Insert control rods to less than 80% rod line (0.3). Monitor APRM back panels for flux oscillations (0.3). If APRM oscillations are >25% peak to peak (0.3), and the magnitude is increasing (0.3), scram the reactor (0.3). Accepted actions per Rev 2, 3, or 4 of AOP-0024 due to the rapid number of revisions to this procedure.
- b. Plant Manager (0.5) or APM-0 in his absence
- c. thermal - hydraulic instabilities in the core (0.5)

REFERENCE

AOP-0024, Decrease in Recirculation System Flow Rate, Rev 2, pgs 2, 3
Standing Order #69, Operation With Single Loop Recirculation Flow
295001K103 3.6/4.1 295001G010 3.8*/3.7*

295001G010 295001K103 ..(KA's)

ANSWER 5.07 (2.00)

- a. Use the manual trip handle at the turbine front standard (1.0)
- b. Motoring of the generator (1.0) and subsequent turbine damage (0.5 if turbine damage is only response).

REFERENCE

AOP-0014, Loss of 125 VDC, Rev 3, pg 3
295004K105 3.3/3.4 295004A102 3.8/4.1

295004A102 295004K105 ..(KA's)

ANSWER 5.08 (1.00)

- a. RCIC (1.0)

REFERENCE

AOP-0050, Station Blackout, Rev 2, pg 11, 12
295003A103 4.4*/4.4* 295003G011 4.1*/4.3*

295003G011 295003A103 ..(KA's)

ANSWER 5.09 (2.00)

- a. When no CRD pumps are running (0.5) and >1 CRD accumulator trouble alarm is in (0.5).
- b. 1 (1.0)

REFERENCE

AOP-0011, Loss of Reactor Plant Component Cooling Water, Rev 3, pg 2, 3
295018K201 3.3/3.4 295018G010 3.4*/3.3*

295018K201 295018G010 ..(KA's)

ANSWER 5.10 (1.00)

c, a, d, b (0.33 for each manipulation to put in the correct order)

REFERENCE

AOP-0027, Fuel Handling Mishaps, Rev 4, pg 3
295023K202 2.9/3.2

295023K202 ..(KA's)

ANSWER 5.11 (2.50)

(5 required at 0.5 each)

1. Containment to annulus dp >5 psid
2. Containment temperature >185 deg F
3. Drywell temperature >330 deg F
4. Reactor pressure and Suppression Pool temperature cannot be maintained in the safe zone of the appropriate figure
5. Suppression pool level and delta THC cannot be maintained in the safe zone of the appropriate figure
6. Suppression pool level and reactor pressure cannot be maintained in the safe zone of the appropriate figure
7. A primary system is discharging into secondary containment and any area temperature, area radiation level, or area water level exceeding its maximum safe operating value in more than one area of the appropriate table
8. Offsite release rates requiring a General Emergency with a primary system discharging outside primary and secondary containments

REFERENCE

EOP-1
295028G012 3.8*/4.3* 295029G012 3.6/4.4*

295029G012 295028G012 ..(KA's)

ANSWER 5.12 (1.00)

HPCS, LPCS, RCIC (0.33 each)

REFERENCE

AOP-0031, Shutdown from Outside the Main Control Room, Rev 5, pg 5
2950166010 3.8*/3.6*

2950166010 ..(KA's)

ANSWER 5.13 (1.00)

If conditions change such that the opposite decision is now true, the procedure must be reentered at that step (1.0). Non coded decision steps do not have to be reentered.

REFERENCE

OSP-0009, Author's Guide/Control and Use of Emergency Operating Procedures, Rev 4, pg 5
2950246012 3.9/4.5

2950246012 ..(KA's)

ANSWER 5.14 (2.00)

a. EOP director/coordinator (1.0)

b. Advisor to the COF (1.0)

REFERENCE

OSP-0009, Rev 4, pg 19, 20
2950256012 3.9*/4.5* 2950166010 3.8*/3.6*

2950246012 2950166010 ..(KA's)

ANSWER 5.15 (1.00)

The most important ingredient is the dialog between the COF and the NCO's.
Also accept communication as dialog. (1.0)

REFERENCE

OSP-0009, Author's Guide/Control and Use of Emergency Operating Procedures,
Rev 4, pg 21
295025G012 3.9*/4.5*

295024G012 ..(KA's)

ANSWER 5.16 (1.50)

- SLC (0.5)
- tripping recirculation pumps (0.5)
- lowering reactor water level (0.5)

REFERENCE

EOP-1A
295037K102 4.1*/4.3* 295027K103 4.2/4.4*

295027K103 295037K102 ..(KA's)

ANSWER 5.17 (1.00)

a (1.0)

REFERENCE

EOP-1A, step 53
295037K306 3.8/4.1

295037K306 ..(KA's)

ANSWER 5.18 (1.50)

- When individual rod movement is observed (0.5)
- 65 psig IA header pressure (0.5)
- When it is determined that instrument air cannot be restored (0.5)

REFERENCE

AOP-0008, Loss of Instrument Air, Rev 3, pg 2, 3
295019G010 3.7*/3.4*

295019G010 ..(KA's)

ANSWER 5.19 (1.00)

b (1.0)

REFERENCE

AOP-0008, Loss of Instrument Air, Rev 3, pg 2, 4
295019K207 3.2/3.2 295019K201 3.8/3.9

295019K201 295019K207 ..(KA's)

ANSWER 5.20 (1.00)

In anticipation of a turbine trip (0.5) from loss of cooling to the turbine lube oil coolers (0.5).

REFERENCE

AOP-0009, Loss of Normal Service Water, Rev 3, pg 2
295005G007 3.1/3.3

295005G007 ..(KA's)

ANSWER 5.21 (1.50)

- a. 3% power (0.5) accept 2 to 4.
- b. 1 (0.5)
- c. EOP-1A ATWS (0.5)

REFERENCE

AOP-0031, Shutdown from Outside the Control Room, Rev 5, pg 13
295016A201 4.1*/4.1*

295016A201 ..(KA's)

ANSWER 5.22 (0.50)

Div I remote shutdown panel (0.5)

REFERENCE

AOP-0031, Shutdown from Outside the Control Room, Rev 5, pg 5
295016K201 4.4*/4.5*

295016K201 ..(KA's)

ANSWER 6.01 (1.00)

b (1.0)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 5 - 7
201001K404 3.6/3.6
201001A204 3.8/3.9

201001A204 201001K404 201001A204 201001K404 ..(KA's)

ANSWER 6.02 (1.00)

d (1.0)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 2
212000K401 3.4/3.6

212000K401 212000K401 ..(KA's)

ANSWER 6.03 (1.50)

- a. RPS MG sets (accept 125 VAC) (0.25) non-safety (0.25)
- b. 125 VDC (0.25) safety related (0.25)
- c. 125 VDC (0.25) non-safety related (0.25)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 2, 4, 9
LOTM-56-2, AC Distribution
LOTM-57-2, DC Distribution
201001K202 3.6*/3.7 201001K203 3.5*/3.6* 201001K205 4.5*/4.5*

201001K205 201001K203 201001K202 201001K205 201001K203
201001K202 ..(KA's)

ANSWER 6.04 (1.00)

a (1.0)

REFERENCE

LOTM-15-2, Reactor Protection System, pg 9
212000A413 3.4/3.6

212000A413 212000A413 ..(KA's)

ANSWER 6.05 (4.00)

- a. LPSP 27.5% reactor power (or 157.6 psig 1st stage turbine pressure)
HPSP 62.5% reactor power (or 410.7 psig 1st stage turbine pressure)
LPAP 37.5% reactor power (or 220.6 psig 1st stage turbine pressure)

b. turbine first stage pressure (0.5)

c. LPSP: Below the LPSP, the Rod Pattern Control System imposes restrictions on rod movements with regard to rod pattern (0.5). Above the LPSP, the Rod Withdrawal Limiter limits the number of notches a control rod may be withdrawn to 4 (0.5).

HPSP: Above the HPSP, the Rod Withdrawal Limiter limits the number of notches a control rod may be withdrawn to 2 (0.5).

LPAP: No control function, indication only.

d. Immediately return the control rod to the position prior to the withdrawal (0.5)

REFERENCE

LOTM-6-2, Rod Control and Information System, pg 14
River Bend Technical Specification 3.1.4.1

201005K102 3.3/3.5 201005K507 3.5/3.5 201005K509 3.5/3.5 201005K510 3.2/3.3
201005A101 3.2/3.3 201005G014 3.5/3.8

201005G014 201005A101 201005K510 201005K509 201005K507
201005K102 201005G014 201005A101 201005K510 201005K509
201005K507 201005K102 ..(KA's)

ANSWER 6.06 (2.50)

1. Shutdown the HPU using the manual pushbutton at H13-P680
2. Shutdown the HPU using the shutdown pushbutton at H13-P614
3. Shutdown the HPU at H13-P614 by placing both subloops in Maintenance
4. Shut the drywell isolation valves at H13-P808
5. Depress the Drywell Pressure Test pushbutton at H13-P614
6. Depress the CRVICS 80P pushbuttons on the H13-P680 panel
(5 required at 0.5 each)

REFERENCE

LOTM-8-2, Recirculation Flow Control, pgs 5 - 8, Figure 4
202002A402 2.8/2.8

202002A402 202002A402 ..(KA's)

ANSWER 6.07 (1.50)

1. RWCU (0.5)
2. RCIC (0.5)
3. RHR (0.5)

REFERENCE

LOTM-51-2, CRVICS, pg 21
2230026007 3.8/3.9

2230026007 2230026007 ..(KA's)

ANSWER 6.08 (0.50)

Main Steam (0.5)

REFERENCE

LOTM-51-2, CRVICS, pgs 3 - 5
223002K608 3.5/3.7 223002A201 3.2/3.5

223002K608 223002K608 223002A201 223002A201 ..(KA's)

ANSWER 6.09 (3.50)

- a. F004 HPCS Injection Valve (0.5)
F015 Suppression Pool Suction Valve (0.5)
HPCS Pump (0.5)
- b. 1. Level decreases to Level 2 (1.0) and the system automatically restarts.
- 2. High Level 8 signal is reset by the operator (1.0) after the level decreases to below the level 8 setpoint.

REFERENCE

LOTM-18-2, HPCS, pg 8
209002A305 3.7/3.7 209002A401 3.7/3.7 209002A402 3.6/3.6 209002A403 3.8/3.8

209002A403 209002A402 209002A401 209002A305 209002A403
209002A402 209002A401 209002A305 ..(KA's)

ANSWER 6.10 (1.00)

a (1.0)

REFERENCE

LOTM-34-2, Feedwater Level Control System, Figure 1
259002K302 3.7/3.7 259002K304 2.9/3.0 259002K305 2.8/2.9

259002K305 259002K304 259002K302 259002K305 259002K304
259002K302 ..(KA's)

ANSWER 6.11 (1.00)

b (1.0)

REFERENCE

LOTM-3-2, Nuclear Boiler Process Instrumentation, Figure 1
216000K122 3.6/3.8

216000K122 216000K122 ..(KA's)

ANSWER 6.12 (0.50)

a. 3 (0.5)

REFERENCE

LOTM-58-2, Standby Diesel Generators and Auxiliaries, pg 16 - 17
264000K401 3.5/3.7 264000K402 4.0/4.2

264000K402 264000K401 ..(KA's)

ANSWER 6.13 (1.50)

- a. 40% (0.25) by turbine first stage pressure (0.25)
- b. During the first part of a scram at the end of cycle, the control rods cannot insert negative reactivity as fast as the collapsing voids can insert positive reactivity (1.0) due to the sudden decrease in steam flow due to a turbine trip or control valve fast closure.

REFERENCE

LOTM-7-2, Recirculation System, pg 12
202001K104 3.3/3.3 202001K505 3.5/3.6

202001K505 202001K104 202001K505 202001K104 ..(KA's)

ANSWER 6.14 (2.00)

- a. - OPERATE SWITCH to OPERATE (0.5) for each subsystem.
- Reactor Pressure < 25 psig (0.5)
- PVLCS air pressure > 50 psig (0.5)
- b. SRVs (0.5)

REFERENCE

LOTM-52-2, Penetration Valve and MSIV Leakage Control Systems, pg 5, Fig 1
239003A301 3.0/2.8 239003K101 3.3/3.4

239003K101 239003A301 239003K101 239003A301 ..(KA's)

ANSWER 6.15 (1.00)

- a (1.0)

REFERENCE

SOP-0091, Fuel Pool Cooling and Cleanup System, Rev 5, pg 39
233000K406 2.9/3.2

233000K406 233000K406 ..(KA's)

ANSWER 6.16 (1.00)

- MSL Rad Monitors - RPS (0.5)
- Off-Gas Monitors - 125 VDC (0.5)

REFERENCE

LOTM-66-2, Process Radiation Monitoring System
272000K201 2.5/2.8 272000K202 2.5/2.8

272000K202 272000K201 272000K202 272000K201 ..(KA's)

ANSWER 6.17 (1.00)

d (1.0)

REFERENCE

LOTM-55-2, Main Generator Auxiliaries, pg 3
245000K605 2.9/2.9

245000K605 245000K605 ..(KA's)

ANSWER 6.18 (2.00)

- a. That the generator frequency is slightly higher than the grid frequency (1.0).
- b. That the generator frequency and grid frequency are in phase (1.0).

REFERENCE

LOTM-54-2, Generator Exciter and Voltage Regulator, pg 12
245000K507 2.6/2.9

245000K507 245000K507 ..(KA's)

ANSWER 6.19 (1.00)

c (1.0)

REFERENCE

LOTM-24-2, Main Steam, Figure 1
239001K119 3.1/3.2

239001K119 ..(KA's)

ANSWER 6.20 (1.00)

d (1.0)

REFERENCE

LOTN-24-2, Main Steam, pg 7
239001K404 3.4/3.5

239001K404 239001K404 ..(KA's)

ANSWER 6.21 (1.00)

Standing Orders (1.0)

REFERENCE

Standing Order #41
294001A103 2.7/3.7

294001A103 ..(KA's)

ANSWER 6.22 (1.00)

Operational Conditions 4 and 5 (0.5 each)

REFERENCE

RBS Technical Specifications Table 6.2.2-1
294001A103 2.7/3.7

294001A103 294001A103 ..(KA's)

ANSWER 6.23 (1.50)

Fail Closed: Should have the air and or power removed (0.5), and the control switch in the closed position (0.5).

Fail Open: Valve should be gagged or a blocking device installed to ensure the valve stays shut (0.5)

REFERENCE

ADM-0027, Protective Tagging, Rev 7, pg 5
294001K102 3.9/4.5*

294001K102 ..(KA's)

ANSWER 6.24 (1.50)

50 psig or 200 deg F (0.75 each)

REFERENCE

ADM-0027, Protective Tagging, Rev 7, pg 6
294001K108 3.1/3.4 294001K109 3.4/3.8

294001K108 294001K109 294001K108 294001K109 ..(KA's)

ANSWER 6.25 (2.00)

- A radiation monitoring device which continuously indicates the dose-rate in the area.
- A dose integrating monitor which is set to alarm when a preset dose is received.
- Accompanied by an individual qualified in radiation protection procedures, with a dose-rate monitoring device.
(2 of 3 at 1.0 each)

REFERENCE

RSP-0200, Radiation Work Permits, Rev 4, pg 11
294001K103 3.3/3.8

294001K103 ..(KA's)

ANSWER 6.26 (2.00)

Shelter (0.5) to the 2 mile radius around the station (0.5)
Shelter (0.5) to the 5 mile radius (0.25) in the downwind (0.125) and
adjacent sectors (0.125)

REFERENCE

EIP-2-005, General Emergency, Rev 6, pg 6
294001A116 2.9*/4.7*

294001A116 ..(KA's)

ANSWER 6.27 (1.00)

a (1.0)

REFERENCE

EIP-2-007, Protective Action Recommendation Guidelines, Rev 7, pg 4
294000A116 2.9*/4.7*

294001A116 ..(KA's)

ANSWER 6.28 (1.00)

d (1.0)

6. PLANT SYSTEMS (30%) AND PLANT-WIDE GENERIC
RESPONSIBILITIES (13%)

REFERENCE

EIP-2-007, Rev 7, pg 4
294001A116 2.9*/4.7*

294001A116 ..(KA's)

ANSWER 6.29 (1.00)

- a. 2
 - b. 2
 - c. 3
 - d. 1
- (0.25 each)

REFERENCE

ADM-0020, Plant Key Control, Rev 4, pg 3
294001K105 3.2/3.7

294001K105 ..(KA's)

TEST CROSS REFERENCE

Page 1

QUESTION	VALUE	REFERENCE
4.01	24.00	9000137

	24.00	
5.01	2.00	9000139
5.02	2.00	9000140
5.03	1.00	9000141
5.04	2.50	9000142
5.05	0.50	9000143
5.06	2.50	9000144
5.07	2.00	9000145
5.08	1.00	9000146
5.09	2.00	9000147
5.10	1.00	9000148
5.11	2.50	9000149
5.12	1.00	9000150
5.13	1.00	9000151
5.14	2.00	9000152
5.15	1.00	9000153
5.16	1.50	9000154
5.17	1.00	9000155
5.18	1.50	9000156
5.19	1.00	9000157
5.20	1.00	9000158
5.21	1.50	9000159
5.22	0.50	9000160

	32.00	
6.01	1.00	9000097
6.02	1.00	9000098
6.03	1.50	9000099
6.04	1.00	9000100
6.05	4.00	9000101
6.06	2.50	9000102
6.07	1.50	9000103
6.08	0.50	9000104
6.09	3.50	9000105
6.10	1.00	9000106
6.11	1.00	9000107
6.12	0.50	9000108
6.13	1.50	9000109
6.14	2.00	9000110
6.15	1.00	9000111
6.16	1.00	9000112
6.17	1.00	9000113
6.18	2.00	9000114
6.19	1.00	9000115
6.20	1.00	9000116
6.21	1.00	9000081
6.22	1.00	9000117
6.23	1.50	9000118
6.24	1.50	9000119
6.25	2.00	9000120
6.26	2.00	9000133

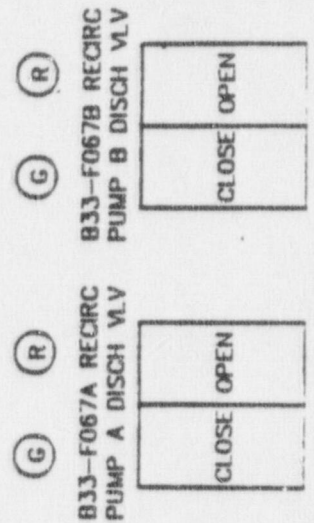
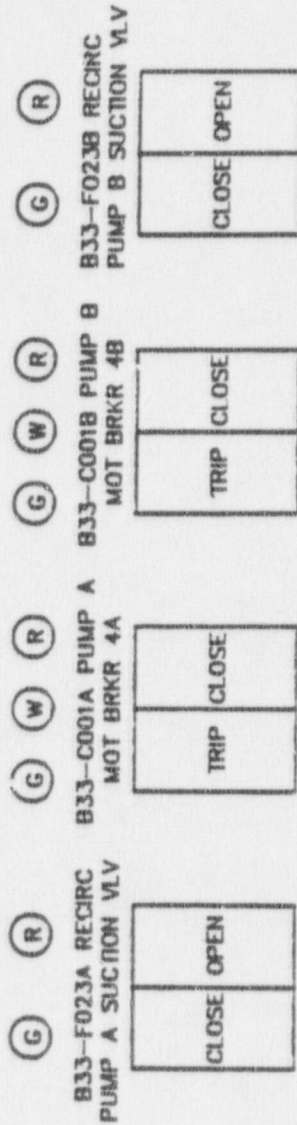
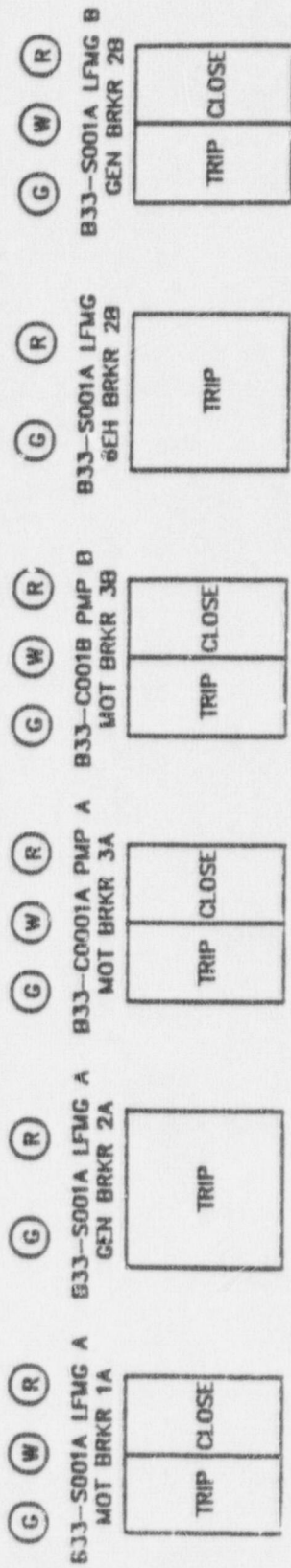
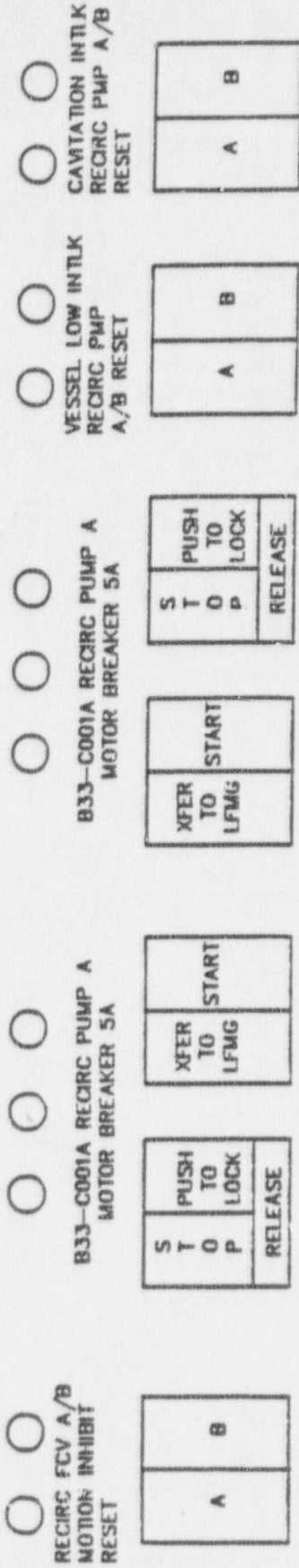
TEST CROSS REFERENCE

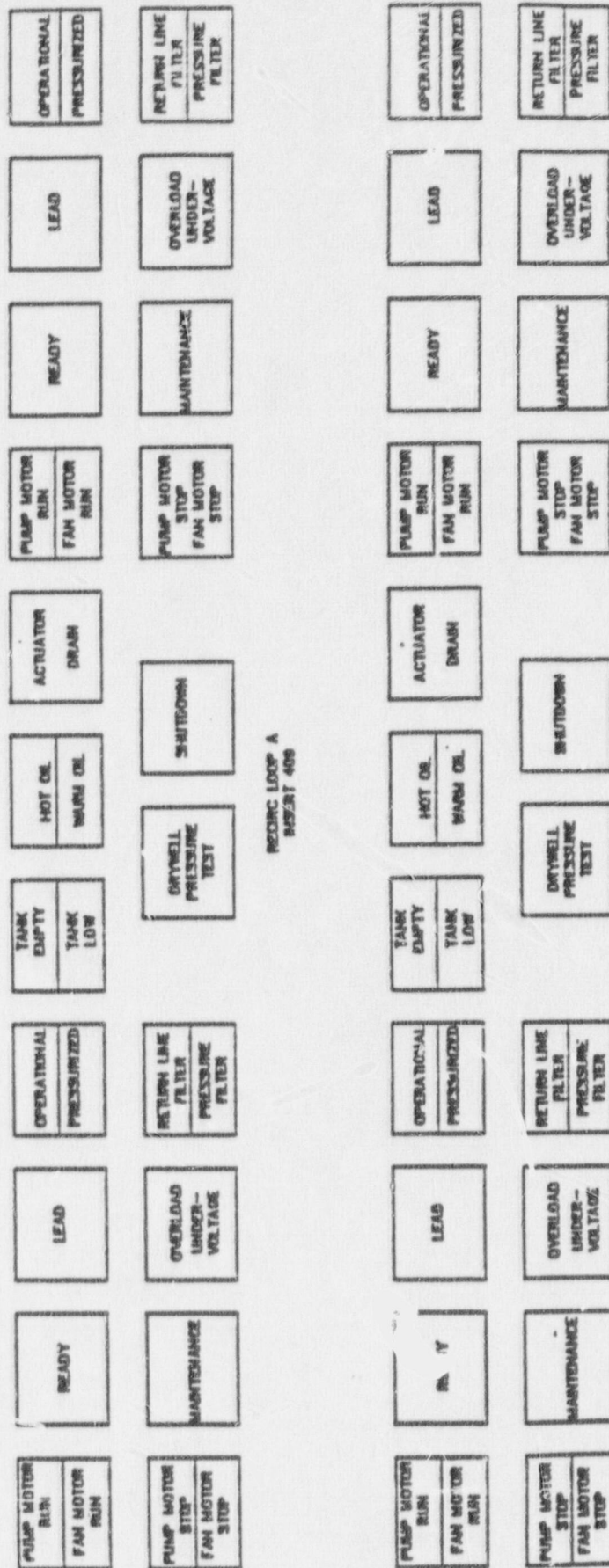
Page 2

QUESTION	VALUE	REFERENCE
6.27	1.00	9000134
6.28	1.00	9000135
6.29	1.00	9000136

	41.50	

	97.50	





RECIRC LOOP A
RESET 406

RECIRC LOOP B
RESET 406

Figure 4
RECIRCULATION FLOW CONTROL SYSTEM INDICATORS: PANEL P#14

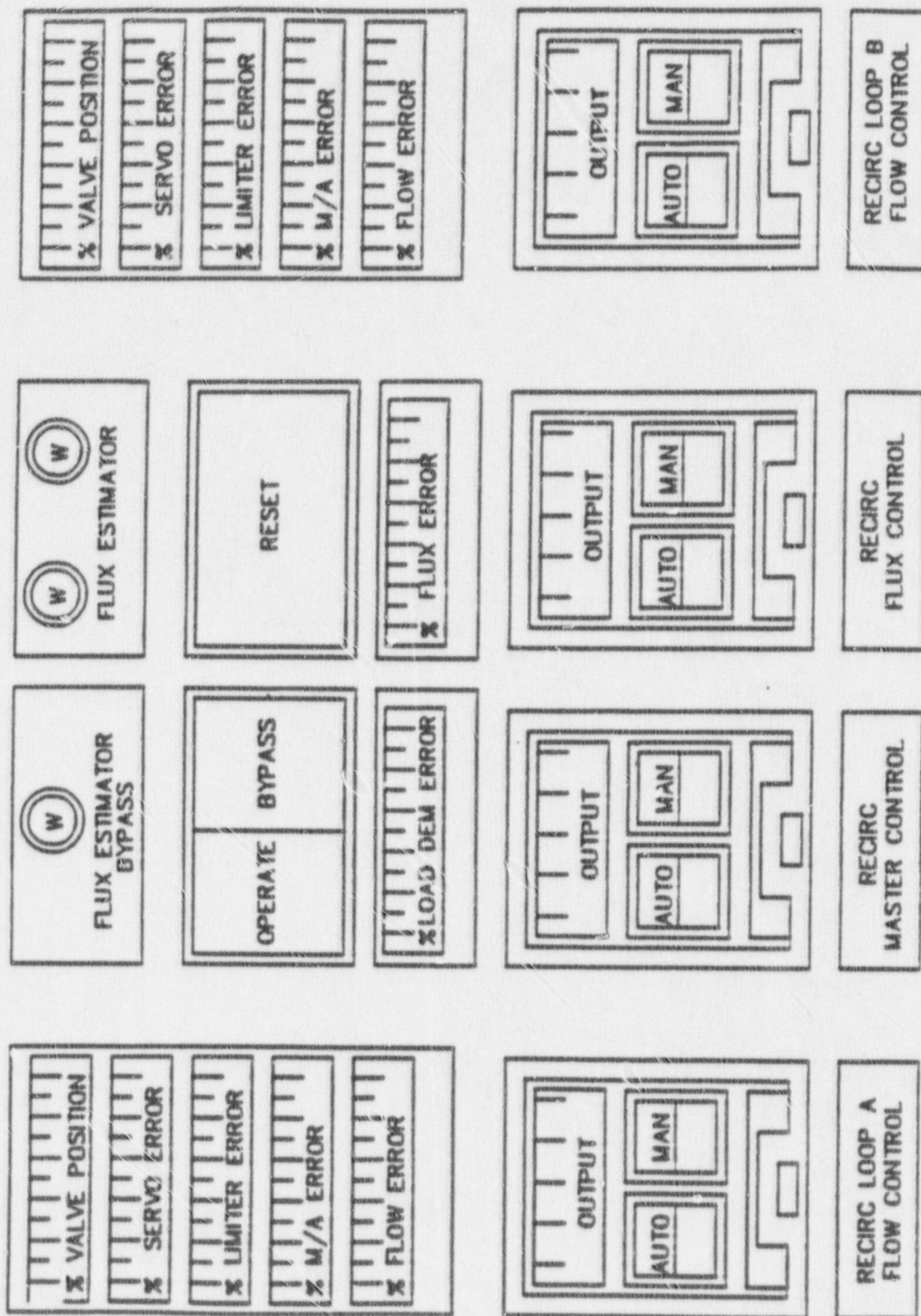


Figure 7

FACILITY COMMENTS ON NRC EXAM ADMINISTERED ON FEBRUARY 14, 1989

2.05 (5.04) - Request additional correct answer to be: ARM and depress ARI pushbuttons. (Reference: EOP-1A step 8)

2.07 (5.06) - a.) Due to the high NRC visibility concerning the LaSalle Events, several revisions of AOP-024 have taken place in a short period of time. Request acceptance of immediate actions of AOP-024, Rev. 2, 3 & 4. c.) Request additional correct answer: flux noise (Reference AOP-024 - Step 5.4.1)

2.09 (5.08) - b.) Request part "b" be deleted - not an immediate action to AOP-050 - operators not required to memorize details of an AOP enclosure. (Reference: AOP-050, Enclosure 4)

2.10 - a.) decrease - also accept as an answer - "failure of SJAE pressure regulator."

5.16 - Request additional correct answer - Downshift recirc. pumps to LFMG. (Reference EOP-1A, Step 11)

3.12 (6.12) - Request deletion of parts a, b and c of this question. (Reference SOP-0053, Step 2.22); LOTM 58-2 incorrect.

3.13 - Request additional correct answer to be "c". (Reference EOP-1A, Step 11 - Appendix A pg. 86 of 186)

6.27 - Request additional correct answers to be "b, c & d". (Reference EIP-2-007, pg. 4 of 19, para. 5.6)

3.27 b & c - Reactor operator not trained on 10 CFR 55.53 e & f. Reference KA 294001A103 stated ability to locate and use procedures and station directives related to shift staffing and activities.

3.31 - a.) Request additional correct answers to read - "Use in critical situations or emergency situations only."

SIMULATION FACILITY FIDELITY REPORT

Facility Licensee: Gulf States Utilities

Facility Licensee Docket No.: 50-458

Facility License No.: NPF-47

Operating Tests Administered at: River Bend Station

Operating Tests Administered: February 15-17 and 22-23, 1989

During the conduct of the simulator portion of the operating tests identified above, the following apparent performance discrepancies were observed:

1. SWP-MOV-4A did not fail open when overridden open. It shut upon receiving an isolation signal. An attempt to recreate the event resulted in the valve failing open as demanded.
2. The procedure to shift recirculation pumps to fast speed in the simulator reflects the changes made to the feedwater flow interlock in the plant. The interlock in the simulator has not been changed to reflect the change made in the actual plant, thus the simulator procedure and simulator system performance do not match.
3. The Division III diesel generator output breaker could not be locally tripped following a loss of 125 VDC. The breaker should be trippable locally without 125 VDC available.
4. When shifting recirculation pumps to fast speed, the START pushbutton for the 5A(B) breaker had to be held in the START position for several seconds to effect the transfer. If not, the pumps tripped. This may not reflect actual plant performance.
5. The displays on the Digital Radiation Monitoring System (DRMS) in the simulator are different from the ones in the plant control room. The displays have different radiation monitoring detector inputs. RBS training staff informed NRC that this was previously noted and a modification package was already in progress to correct the discrepancy.