

June 6, 1996

Mr. Robert G. Byram
Senior Vice President - Nuclear
Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

SUBJECT: NRC COMBINED EXAMINATION REPORT NOS. 50-387/96-05 (OL) AND
50-388/96-05 (OL)

Dear Mr. Byram:

The NRC Examination Report Nos. 50-387/96-05 and 50-388/96-05, dated June 3, 1996, contained sporadic reproduction errors, and we are reissuing the report. The copies of the report, dated June 3, 1996, have not been mailed out to your Training Department.

We regret any inconvenience this may have caused you.

Sincerely,

(original signed by)

Glenn W. Meyer, Chief
Operator Licensing and
Human Performance Branch
Division of Reactor Safety

Docket Nos. 50-387
50-388

Enclosure: Cover Letter and Examination Report Nos.
50-387/96-05 and 50-388/96-05 w/Attachments 1-5

170052

9606180138 960606
PDR ADOCK 05000387
V PDR

1E42 1/1



Mr. Robert G. Byram

2

cc w/encl; w/o Attachments 1-5:

- G. T. Jones, Vice President - Nuclear Engineering
 - G. Kuczynski, Plant Manager
 - J. M. Kenny, Supervisor, Nuclear Licensing
 - G. D. Miller, Manager - Nuclear Engineering
 - R. R. Wehry, Nuclear Licensing
 - M. M. Urioste, Nuclear Services Manager, General Electric
 - C. D. Lopes, Manager - Nuclear Security
 - W. Burchill, Manager, Nuclear Safety Assessment
 - H. D. Woodeshick, Special Office of the President
 - J. C. Tilton, III, Allegheny Electric Cooperative, Inc.
- Nuclear Safety Information Center (NSIC)
Commonwealth of Pennsylvania

cc w/encl and Attachments 1-5:

- A. Fitch, Nuclear Operations Training Supervisor
- B. Stitt, Nuclear Operations Training Supervisor
- W. Lowthert, Manager, Nuclear Training

Distribution w/encl and Attachments 1-5:

DRS Master Exam File
PUBLIC
Nuclear Safety Information Center (NSIC)

Distribution w/encl; w/o Attachments 1-5:

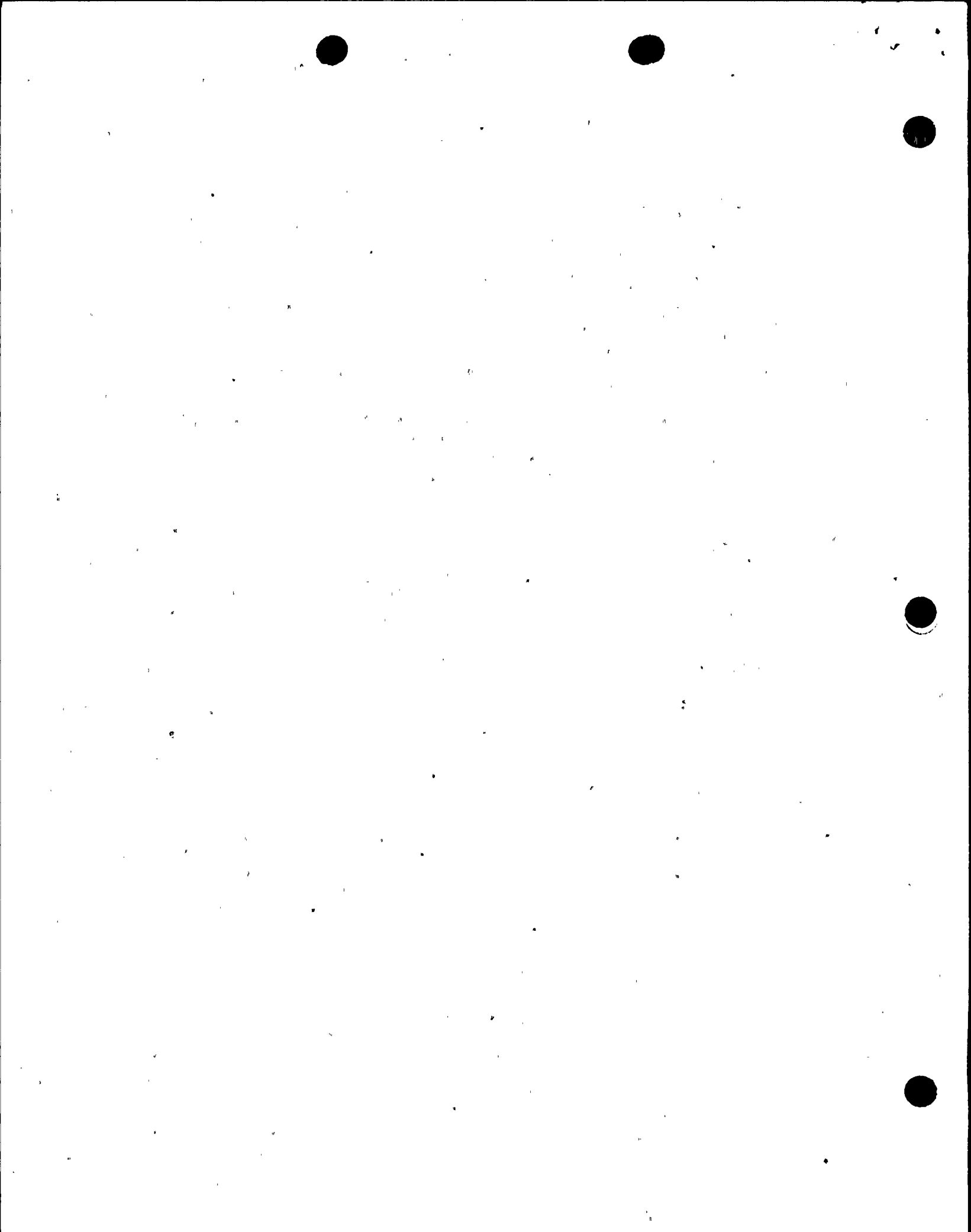
Region I Docket Room (with concurrences)
J. Wiggins, DRS
D. Florek, Chief Examiner, DRS
S. Willoughby, Contract Examiner, LITCO
NRC Resident Inspector
DRS OL Facility File

DOCUMENT NAME: A:SU960505.2nd

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	RI/DRS	RI/DRS	/				
NAME	DFlorek/dmg	GMeyer					
DATE	06/06/96	06/6/96	06/ /96	06/ /96	06/ /96	06/ /96	06/ /96

OFFICIAL RECORD COPY



ATTACHMENT 1
RO EXAMINATION AND ANSWER KEY

9606180138

U. S. NUCLEAR REGULATORY COMMISSION

SITE SPECIFIC EXAMINATION

REACTOR OPERATOR LICENSE

REGION 1

APPLICANT'S NAME: _____

FACILITY: Susquehanna 1 & 2

REACTOR TYPE: BWR-GE4

DATE ADMINISTERED: April 15, 1996

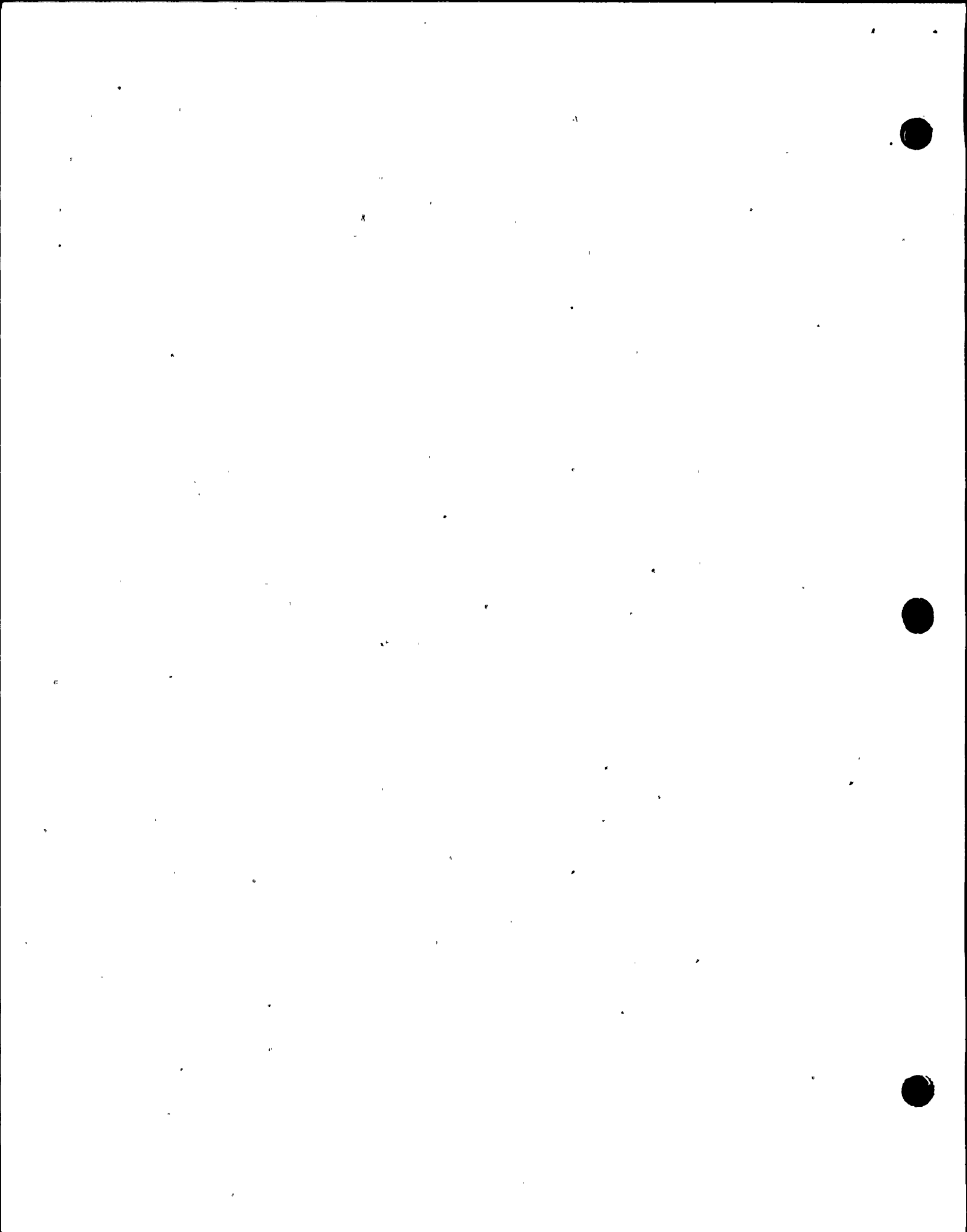
INSTRUCTIONS TO APPLICANT:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

TEST VALUE	APPLICANT'S SCORE	FINAL GRADE
100.00		

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

Applicant's Signature



A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE						023	a	b	c	d	___
001	a	b	c	d	___	024	a	b	c	d	___
002	a	b	c	d	___	025	a	b	c	d	___
003	a	b	c	d	___	026	a	b	c	d	___
004	a	b	c	d	___	027	a	b	c	d	___
005	a	b	c	d	___	028	a	b	c	d	___
006	a	b	c	d	___	029	a	b	c	d	___
007	a	b	c	d	___	030	a	b	c	d	___
008	a	b	c	d	___	031	a	b	c	d	___
009	a	b	c	d	___	032	a	b	c	d	___
010	a	b	c	d	___	033	a	b	c	d	___
011	a	b	c	d	___	034	a	b	c	d	___
012	a	b	c	d	___	035	a	b	c	d	___
013	a	b	c	d	___	036	a	b	c	d	___
014	a	b	c	d	___	037	a	b	c	d	___
015	a	b	c	d	___	038	a	b	c	d	___
016	a	b	c	d	___	039	a	b	c	d	___
017	a	b	c	d	___	040	a	b	c	d	___
018	a	b	c	d	___	041	a	b	c	d	___
019	a	b	c	d	___	042	a	b	c	d	___
020	a	b	c	d	___	043	a	b	c	d	___
021	a	b	c	d	___	044	a	b	c	d	___
022	a	b	c	d	___	045	a	b	c	d	___

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

- | | | | | | | | | | | | |
|-----|---|---|---|---|-----|-----|---|---|---|---|-----|
| 046 | a | b | c | d | ___ | 069 | a | b | c | d | ___ |
| 047 | a | b | c | d | ___ | 070 | a | b | c | d | ___ |
| 048 | a | b | c | d | ___ | 071 | a | b | c | d | ___ |
| 049 | a | b | c | d | ___ | 072 | a | b | c | d | ___ |
| 050 | a | b | c | d | ___ | 073 | a | b | c | d | ___ |
| 051 | a | b | c | d | ___ | 074 | a | b | c | d | ___ |
| 052 | a | b | c | d | ___ | 075 | a | b | c | d | ___ |
| 053 | a | b | c | d | ___ | 076 | a | b | c | d | ___ |
| 054 | a | b | c | d | ___ | 077 | a | b | c | d | ___ |
| 055 | a | b | c | d | ___ | 078 | a | b | c | d | ___ |
| 056 | a | b | c | d | ___ | 079 | a | b | c | d | ___ |
| 057 | a | b | c | d | ___ | 080 | a | b | c | d | ___ |
| 058 | a | b | c | d | ___ | 081 | a | b | c | d | ___ |
| 059 | a | b | c | d | ___ | 082 | a | b | c | d | ___ |
| 060 | a | b | c | d | ___ | 083 | a | b | c | d | ___ |
| 061 | a | b | c | d | ___ | 084 | a | b | c | d | ___ |
| 062 | a | b | c | d | ___ | 085 | a | b | c | d | ___ |
| 063 | a | b | c | d | ___ | 086 | a | b | c | d | ___ |
| 064 | a | b | c | d | ___ | 087 | a | b | c | d | ___ |
| 065 | a | b | c | d | ___ | 088 | a | b | c | d | ___ |
| 066 | a | b | c | d | ___ | 089 | a | b | c | d | ___ |
| 067 | a | b | c | d | ___ | 090 | a | b | c | d | ___ |
| 068 | a | b | c | d | ___ | 091 | a | b | c | d | ___ |

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

092 a b c d ___

093 a b c d ___

094 a b c d ___

095 a b c d ___

096 a b c d ___

097 a b c d ___

098 a b c d ___

099 a b c d ___

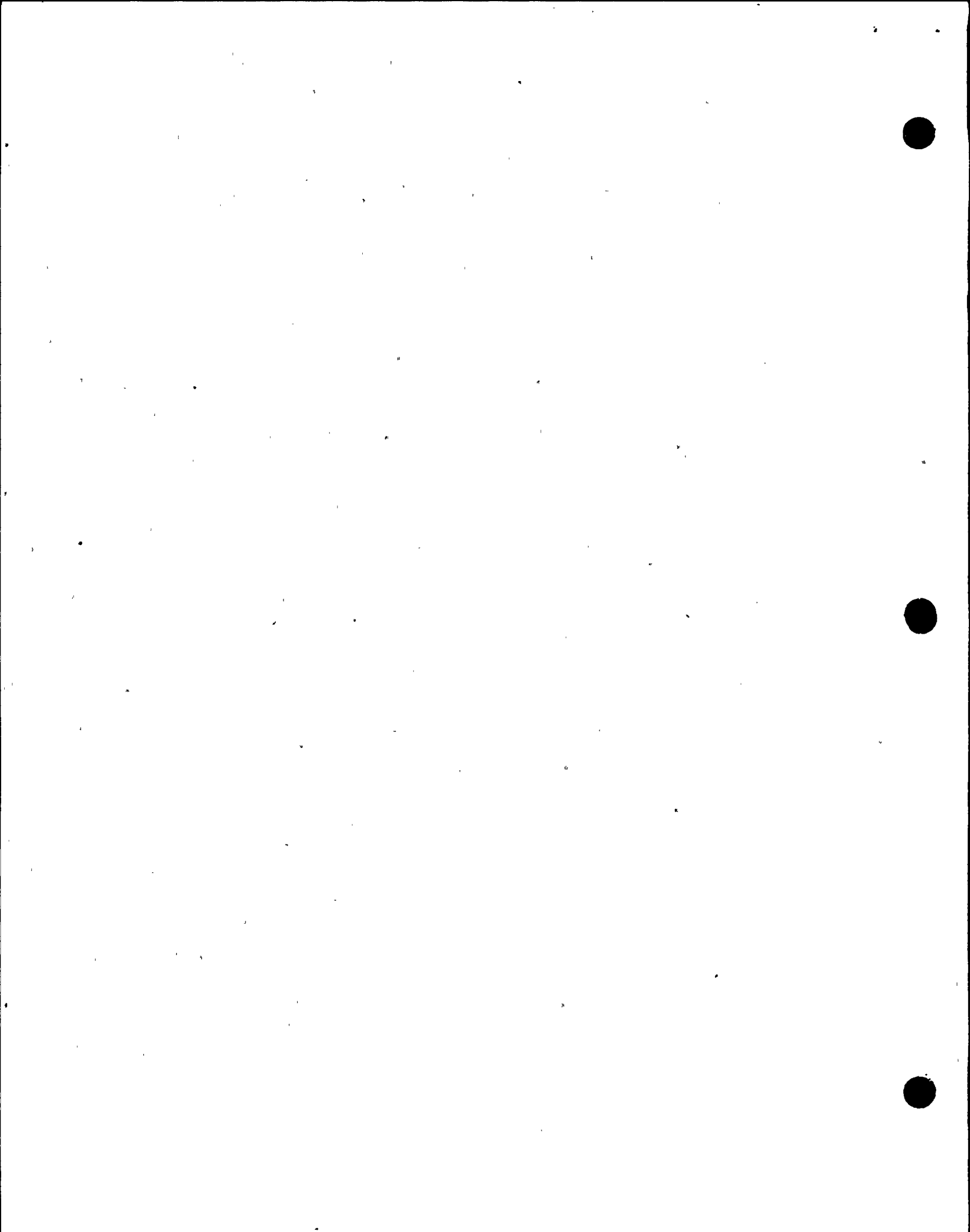
100 a b c d ___

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

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 applicant 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 and each answer sheet.
6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.
7. The point value for each question is indicated in parentheses after the question.
8. If the intent of a question is unclear, ask questions of the examiner only.
9. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.
10. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.
11. To pass the examination, you must achieve a grade of 80% or greater.
12. There is a time limit of four (4) hours for completion of the examination.
13. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.



QUESTION: 001 (1.00)

The following conditions exist:

- Automatic Depressurization System - automatically actuated
- Reactor water level - steady at -150 inches
- All RHR and CS pumps - running
- 102 second timer - timed out
- 6 ADS valves - open
- Drywell pressure - 1.5 psig and decreasing
- Reactor pressure - 200 psig

If timer reset buttons are momentarily depressed, which of the following describes the result on the Automatic Depressurization System?

The SRVs will:

- a. remain open.
- b. close and remain closed.
- c. close and then reopen after 102 seconds.
- d. close and reopen when the buttons are released.

QUESTION: 002 (1.00)

With the APRM Channel meter function switch in the "Count" position, select the MINIMUM reading for an operable APRM.

(Assume the LPRM per level requirements are met.)

- a. 65%
- b. 70%
- c. 75%
- d. 100%

QUESTION: 003 (1.00)

The High Pressure Coolant Injection System automatically initiated due to low RPV level during a station blackout.

Which of the following describes the preferred method of operating HPCI during the blackout?

- a. When RPV level is restored between +13 to +54 inches, manually shutdown HPCI.
- b. Manually control HPCI speed as necessary to maintain RPV level between +13 and +54 inches.
- c. Allow HPCI to automatically control level between the high level trip and the low level initiation setpoint.
- d. Alternate between injection mode and CST to CST mode to maintain HPCI in operation.

QUESTION: 004 (1.00)

A scram occurred and eight control rods did NOT fully insert. Rod positions vary from 08 to fully withdrawn.

When attempting to drive control rods inward in accordance with emergency operating procedures, you are required to:

- a. start with rods on the core periphery and move inward in a spiral direction.
- b. start with rods near the core center and move outward in a spiral direction.
- c. rotate quadrants and first insert rods with intermediate positions followed by fully withdrawn rods.
- d. rotate quadrants and first insert fully withdrawn rods followed by intermediate position rods.

QUESTION: 005 (1.00)

The plant was operating at 100% power when APRM chart recorders and annunciators indicated that a high APRM scram should have occurred.

Which of the following conditions would require entry into EOP 113, Level/Power Control?

- a. Entered following insertion of a manual scram if 2 or more rods remain at position 04.
- b. Entered following insertion of a manual scram only if power remains above 5%.
- c. Entered immediately based on APRM Upscale annunciators.
- d. Entered upon verification that the automatic scram did not result in insertion of all control rods to or beyond position 02.

QUESTION: 006 (1.00)

Given the following conditions:

- The plant is at 100% power.
- A fire has occurred in the Reactor Building and is spreading.
- Conditions have deteriorated such that Rapid Depressurization is required.

As system pressure is decreasing, which of the following area temperatures should be monitored to determine the accuracy of RPV level instrumentation?

- a. 645' RHR Equipment Area 1
- b. 683' General Area
- c. 749' General Area
- d. 779' General Area

QUESTION: 007 (1.00)

An ATWS is in progress and a Main Steam Line Isolation then occurs. RCIC initiated and is maintaining level. SRVs are being opened by the operator to control pressure. Suppression pool water level is decreasing due to a leak in a Core Spray Suction line.

A rapid depressurization is required if suppression pool level drops below 12 feet in order to:

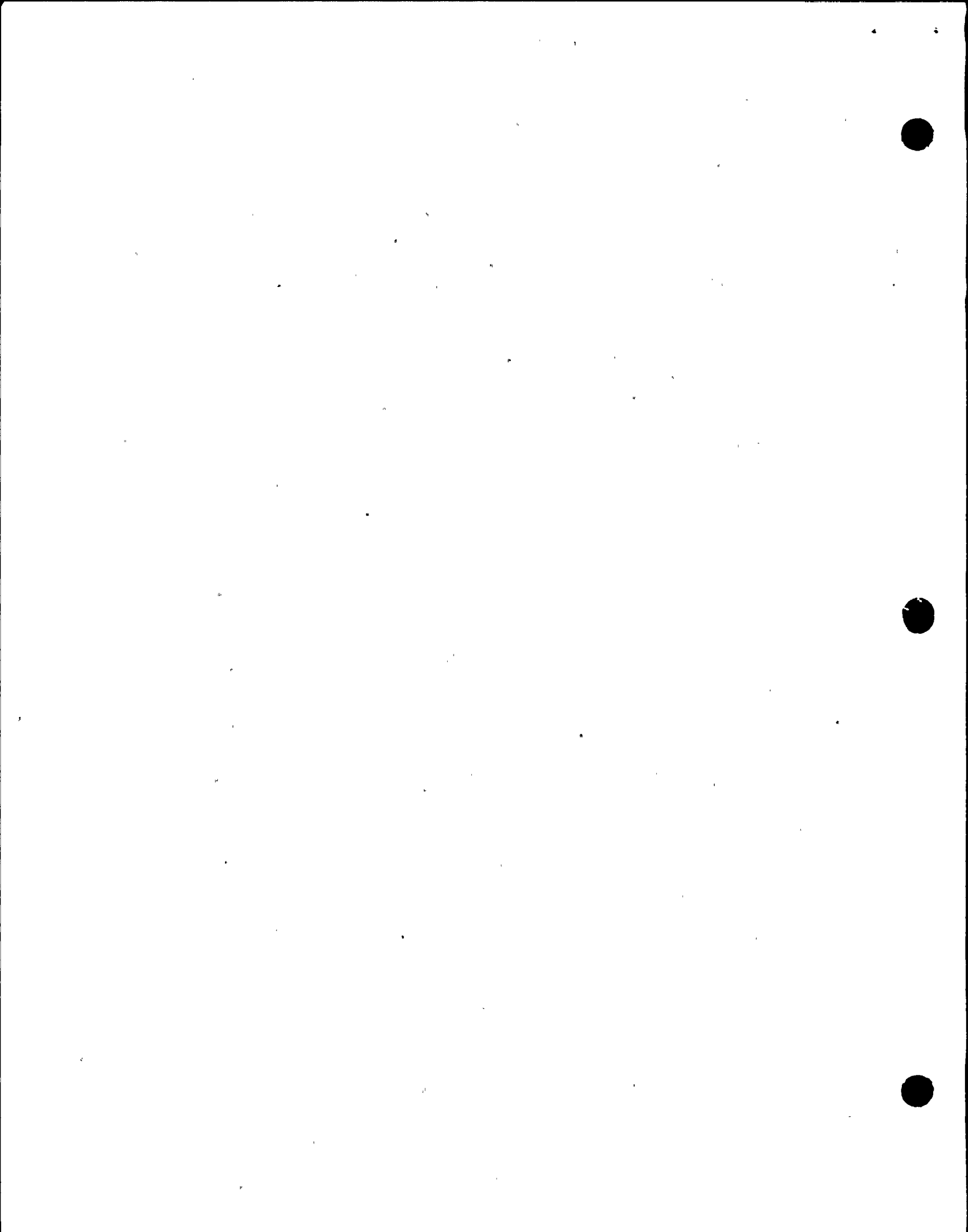
- a. prevent operation at pressure with the RCIC exhaust line uncovered.
- b. prevent operation at pressure with the Drywell-Suppression Pool downcomers uncovered.
- c. allow depressurization to take place prior to uncovering the ECCS suction lines.
- d. allow depressurization to take place prior to uncovering the SRV T-quenchers.

QUESTION: 008 (1.00)

The plant is operating at 100% power when a loss of instrument air occurs.

Which of the following would require a manual reactor scram?

- a. CRD system flow drops below 10 GPM.
- b. Instrument air pressure decreases to 70 psig.
- c. Three rods have drifted from their target position.
- d. A rod block occurs due to scram discharge volume level.



QUESTION: 009 (1.00)

The Reactor Core Isolation Cooling (RCIC) system initiated at -30 inches due to no other injection systems operating. RCIC then raised level to +54 inches.

Identify the response of the RCIC to the high level and subsequent level decrease to -30 inches.

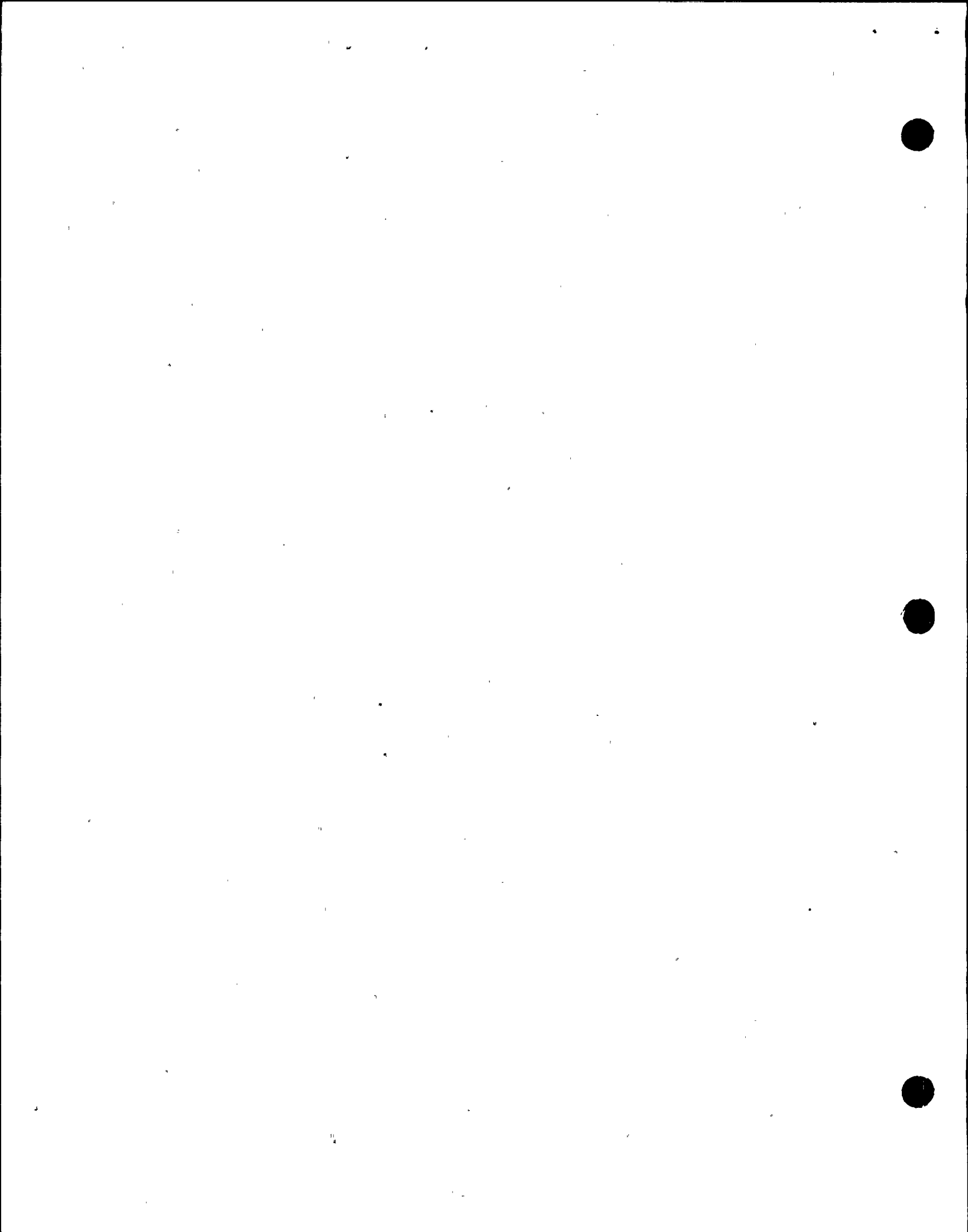
- a. RCIC turbine trips on high level and must be manually reset to allow the turbine to restart at -30 inches.
- b. RCIC Turbine Steam Inlet Valve (F045) will close on high level and the high level seal-in must be manually reset to allow F045 to reopen at -30 inches.
- c. The RCIC turbine governor valve goes shut on high level and the governor valve will automatically reset restarting the turbine at -30 inches.
- d. RCIC Turbine Steam Inlet Valve (F045) will close on high level and will automatically reopen and restart the turbine at -30 inches.

QUESTION: 010 (1.00)

A failure to scram has occurred from 100% power.

Identify why the recirculation pump speed is reduced to minimum prior to tripping the recirculation pumps.

- a. To avoid tripping the turbine due to high RPV water level.
- b. To determine if reducing speed is sufficient to reduce power to less than 5% on the APRMs.
- c. To limit the rapid power reduction transient due to tripping recirculation pumps from high power.
- d. To avoid initiating HPCI and RCIC on low water level.



QUESTION: 011 (1.00)

A loss of drywell cooling occurs on Unit 1. Drywell pressure increases to 2.9 psig. Drywell temperature increases to 155 degrees F.

Identify all sections of the Emergency Operating Procedures that would be entered.

- a. All sections of EOP-103, Primary Containment Control. No entry to EOP-102, RPV Control is required.
- b. Primary Containment Pressure (PC/P) and Drywell Temperature (DW/T) sections of EOP-103, Primary Containment Control. No entry to EOP-102, RPV Control is required.
- c. Primary Containment Pressure (PC/P) and Drywell Temperature (DW/T) sections of EOP-103, Primary Containment Control and all sections of EOP-102, RPV Control.
- d. All sections of EOP-102, RPV Control and all sections of EOP-103, Primary Containment Control.

QUESTION: 012 (1.00)

While executing EOP-113, Level/Power Control, which of the following methods of control rods insertion requires the scram to be reset?

Control rod insertion by:

- a. driving rods with the Reactor Manual Control System.
- b. using the individual control rod scram test switches.
- c. venting the scram air header.
- d. venting the HCU overpiston line.

QUESTION: 013 (1.00)

Core offloading is in progress and a fuel bundle is being raised from the core. Before the grapple actually reaches the normal up position, the "Normal Up" indicating light illuminates and upward motion stops.

Which of the following describes the use of the Hoist Override pushbutton in this situation?

- a. The use of the Hoist Override pushbutton is prohibited when handling irradiated fuel unless specific direction is contained in an OP-ORF procedure.
- b. The Hoist Override pushbutton may be used if a second licensed operator is available to verify actual hoist position.
- c. Only the refuel floor SRO may authorize use of the Hoist Override pushbutton.
- d. The Hoist Override pushbutton is interlocked in a disabled condition when over the core and loaded and thus, cannot be used.

QUESTION: 014 (1.00)

Which of the following will prevent RCIC discharge to the CST through the test line isolation valves F022 and F011?

- a. CST low level and alarm (10,000 gal).
- b. RCIC minimum flow valve is open (F019).
- c. Reactor water level is -55 inches.
- d. The CST suction valve is not full open (F010).

QUESTION: 015 (1.00)

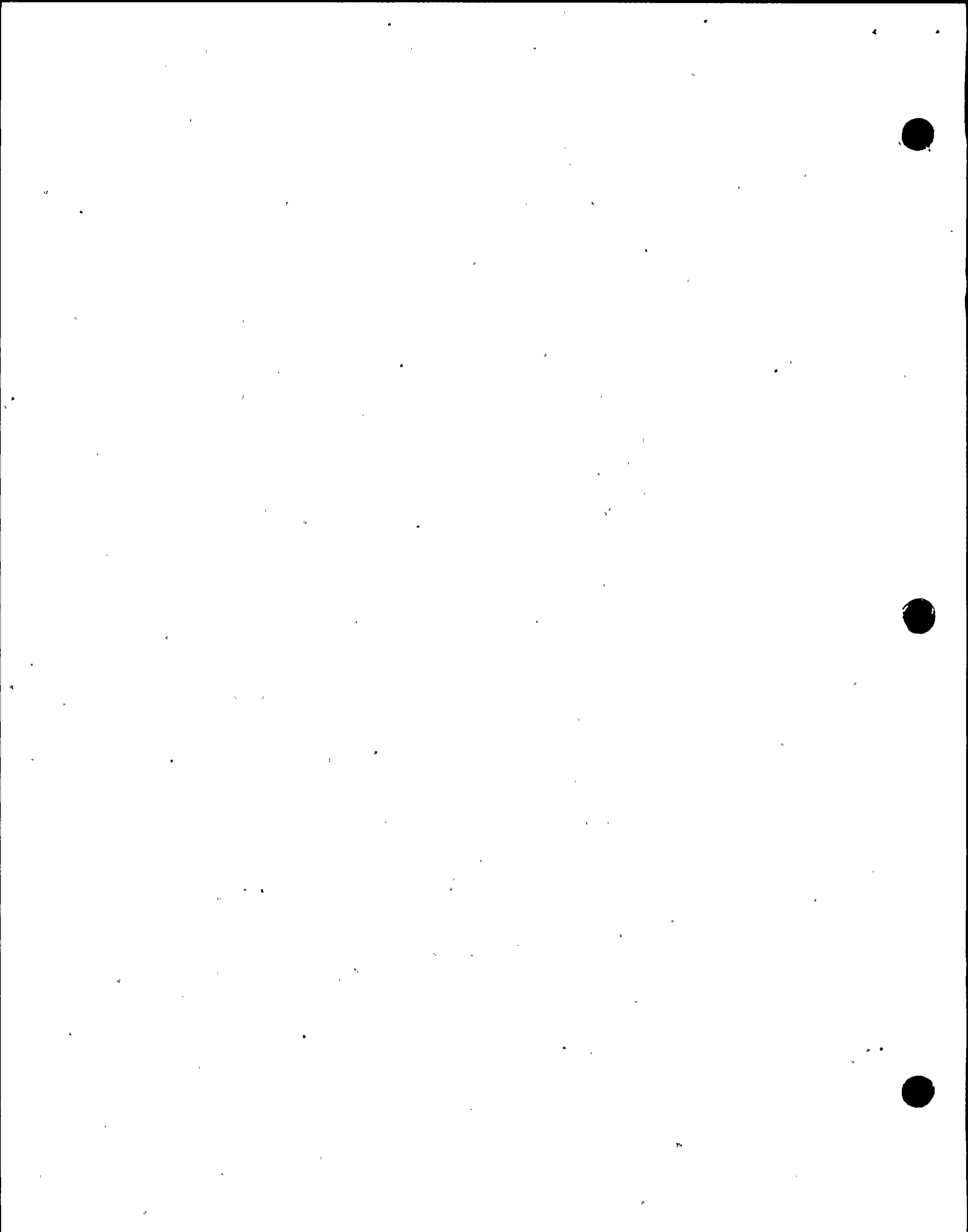
Which of the following will automatically trip the Condenser Mechanical Vacuum Pump?

- a. Condenser suction valve HV-10731 not full open.
- b. Offgas Post Treatment High radiation.
- c. All Main Steam Line RMS INOP.
- d. Mode switch in RUN.

QUESTION: 016 (1.00)

With the Refueling Platform over the core, which of the following, BY ITSELF, will initiate a rod withdraw block for any selected rod?

- a. Grapple not full down.
- b. Mode switch in REFUEL.
- c. Trolley Auxiliary Hoist loaded.
- d. Any single rod not fully inserted.



QUESTION: 017 (1.00)

The following conditions exist:

- RHR shutdown cooling loop A is in operation.
- Reactor water level is 55 inches.

Under these conditions, which of the following has NO protective features or interlocks to prevent draining the reactor vessel?

- a. Shutdown Cooling Suction Inboard Valve (F009).
- b. RHR Pump Minimum Flow Valve F007A.
- c. Shutdown Cooling Suction Valve F006A/C.
- d. Injection Isolation Valve F015A.

QUESTION: 018 (1.00)

The scram discharge volume vent and drain valves did NOT close when a scram occurred.

Which of the following would be the adverse consequence?

- a. The running CRD pump will go into runout and overheat.
- b. There will be a primary leak to secondary containment.
- c. Excess control rod insertion speed will damage the drive mechanism.
- d. Control rod scram times will be longer than normal.

QUESTION: 019 (1.00)

With an initial main condenser vacuum of 28" HgA, and a loss of vacuum in progress, at what decreasing vacuum will the main condenser be lost as a heat sink for decay heat removal using the bypass valves?

- a. 22.9" HgA
- b. 21.7" HgA
- c. 5.1" HgA
- d. 0.0" HgA

QUESTION: 020 (1.00)

Which of the following violates the Maximum Thermal Power (Mwt) level?

Note: Assume the 8 hour average power level is 100%.

- a. Power reaches 3502 Mwt.
- b. Power is 3475 Mwt for 1/2 hour.
- c. Power is 3468 Mwt for 3/4 hour.
- d. Power is 3458 Mwt for one hour.

QUESTION: 021 (1.00)

The Plant Control Operator (PCO) with AT THE CONTROLS responsibility is required to momentarily monitor a back panel.

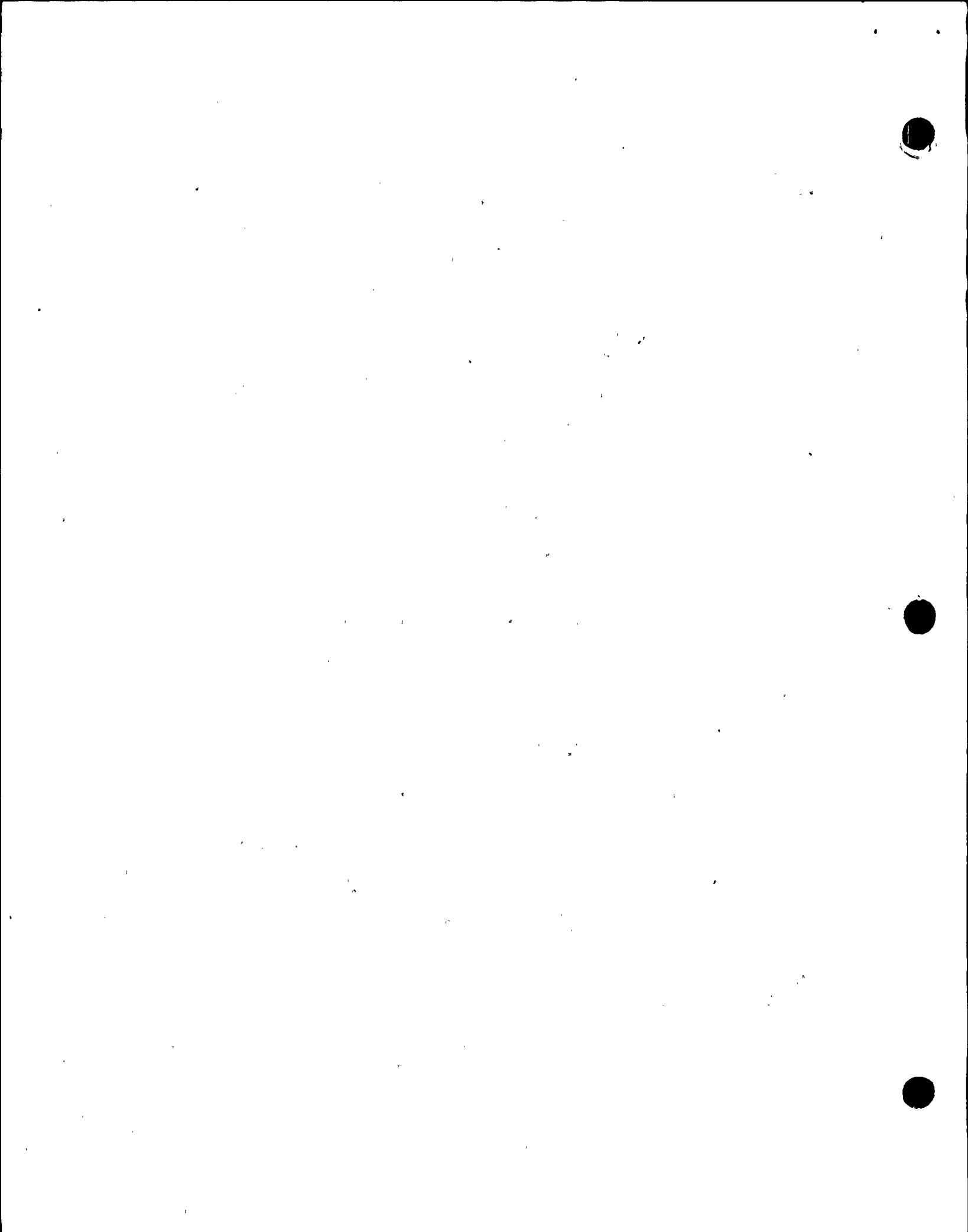
Which of the following is necessary?

- a. The PCO from the other unit, not assigned AT THE CONTROLS responsibility, must be within view of the control panels.
- b. Any PCO or the Unit Supervisor, assigned to the same unit, must be within view of the control panels.
- c. The Unit Supervisor must temporarily accept AT THE CONTROLS responsibility for that unit.
- d. Another PCO must relieve AT THE CONTROLS responsibility for that unit.

QUESTION: 022 (1.00)

During EOP implementation, which of the following must be performed by referring to the specific procedure for that activity?

- a. Maximizing CRD flow following loss of high pressure feedwater.
- b. Resetting Alternate Rod Insertion (ARI) during an ATWS.
- c. Transferring in-service TBCCW to ESW.
- d. Placing RHR Suppression Pool cooling in service with a LPCI initiation.



QUESTION: 023 (1.00)

When can a NPO scram control rods using the select rod insert switches?

- a. During an ATWS under direction of a PCO.
- b. Scram time testing in Condition 4.
- c. The control rod is stuck at "02" and should be a "00".
- d. Friction testing in Condition 5.

QUESTION: 024 (1.00)

During "normal" conditions, access to the AT THE CONTROLS area shall be controlled by:

- a. the Shift Supervisor.
- b. the Control Room Coordinator.
- c. a designated senior licensed individual.
- d. the Plant Control Operator or the Unit Supervisor.

QUESTION: 025 (1.00)

Which of the following is the required action when a review of operating logs after a transient shows that a Safety Limit has been violated?

- a. Shift Management must approve continued power operation.
- b. The reactor must be limited to less than 25% rated thermal power.
- c. The reactor must be immediately scrammed.
- d. The reactor must be in hot shutdown within 2 hours.

QUESTION: 026 (1.00)

While at power the MOV Test Switch for the Unit 1 RHRSW Heat Exchanger 'A' Inlet, HV-11210A is in the "Operate" position.

Which of the following applies?

- a. Verify that an active work request exists for the valve.
- b. Place the MOV thermal overload protection in service within 8 hours.
- c. Declare the valve inoperable until the correct switch position is determined.
- d. No action required as this is the normal position of the switch.

QUESTION: 027 (1.00)

Based on operations guidelines, which is NOT an acceptable basis to justify stopping an automatic ECCS actuation?

- a. Directed by the Unit Supervisor while implementing an EOP.
- b. Automatic mis-operation has been confirmed by independent indications.
- c. ECCS equipment damage may result.
- d. Adequate core cooling is assured.

QUESTION: 028 (1.00)

Which of the following is the REQUIRED action for performing an independent verification that a lockwired manual flow balance valve is in the correct position?

- a. Remove the lockwire, check that the valve is set properly then reinstall the lockwire.
- b. Verify that the operator positioning the valve signed for the valve being correctly set and lockwired.
- c. Remove the lockwire, reset the valve, check the position and reinstall the lockwire.
- d. Verify that the lockwire is intact and properly installed.

QUESTION: 029 (1.00)

One step of a Unit 1 scheduled surveillance test calls for operating equipment on Unit 2 and is obviously incorrect.

Which of the following is the REQUIRED action for the operator assigned to perform this surveillance?

- a. Have the Unit 1 Supervisor correct the procedure in black pen, initial and date the change.
- b. Place the system in a safe condition, notify Shift Management, and conduct no further steps until a PCAF is approved.
- c. Obtain both the Unit 1 and Unit 2 Supervisor's concurrence and correct the procedure in black pen, initial and date the change.
- d. Obtain the Unit 1 Supervisors concurrence and perform the surveillance by operating the Unit 1 equipment.

QUESTION: 030 (1.00)

During absence of the Shift Supervisor from the control room, while both units are in OPERATIONAL CONDITION 4, which of the following MAY be designated to assume the control room command function in accordance with technical specifications.

- a. Only an individual with a valid Senior Operator license.
- b. An individual with a valid Senior Operator license or Operator license.
- c. Only an individual, excluding the STA, with a valid Senior Operator license.
- d. Only an individual with a valid Senior Operator license who is also qualified as Unit Supervisor.

QUESTION: 031 (1.00)

The following situation exists:

- A licensed individual has just finished drinking one can of beer at home when the Shift Supervisor calls and requests that he/she report for unscheduled overtime in a non-licensed operator position.
- No one else is available.

The licensed individual is personally:

- a. required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in but is not required to inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- b. required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in and inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- c. not required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in but is required to inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- d. not required to inform either the Shift Supervisor or the Security Shift Supervisor that he/she had been drinking alcohol.

QUESTION: 032 (1.00)

Which of the following requires that a Limitorque MOV, in a safety related system, be considered inoperable?

- a. Engaging the manual clutch lever.
- b. Cycling open then immediately closing the MOV breaker.
- c. Reinstallation of the control power fuses that were momentarily removed.
- d. Opening the limit switch cover for visual observation during operation of the valve.

QUESTION: 033 (1.00)

With fuel in the core, which of the following is a core alteration?

- a. Replacement of a control rod blade with a new one.
- b. Installation of a special moveable source range detector.
- c. Withdrawal of one Source Range Monitor (SRM) detector.
- d. Withdrawal of a control rod with no fuel in the associated core cell.

QUESTION: 034 (1.00)

Control rod coupling checks must be completed:

- a. for all control rods, prior to reactor criticality after completing any shutdown.
- b. for any control rod that has received a rod drift alarm.
- c. only the first time that each control rod reaches position 48 after a reactor startup.
- d. anytime the control rod is withdrawn to the full out position during operation.



QUESTION: 035 (1.00)

Which of the following describes the response of a control rod if the ball check valve in the drive mechanism is stuck closed during a scram?

(Assume normal HCU operation and accumulator pressure.)

The control rod will:

- a. insert until accumulator pressure is less than reactor pressure.
- b. insert until accumulator pressure is less than 400 psig.
- c. fully scram faster than normal.
- d. fully scram slower than normal.

QUESTION: 036 (1.00)

In addition to a ROD OVERTRAVEL annunciator alarm, which of the following is indication of an UNCOUPLED control rod when fully withdrawing a control rod?

- a. Green FULL OUT lights extinguish.
- b. Rod position indication goes blank.
- c. Green FULL OUT lights illuminate.
- d. Green ROD SELECTED light goes out.

QUESTION: 037 (1.00)

Which of the following will bypass ALL rod blocks caused by SRM "A"?

- a. All IRM switches on range 8.
- b. Reactor mode switch in REFUEL.
- c. SRM "A" detector fully withdrawn.
- d. SRM "A" function switch NOT in operate.

QUESTION: 038 (1.00)

Which of the following describes automatic operation of the in service control rod drive Flow Control Valve, immediately after a scram?

The Flow Control Valve will:

- a. open further to maintain flow at the desired setpoint.
- b. remain as is until the scram is reset.
- c. receive a close signal.
- d. receive an open signal.

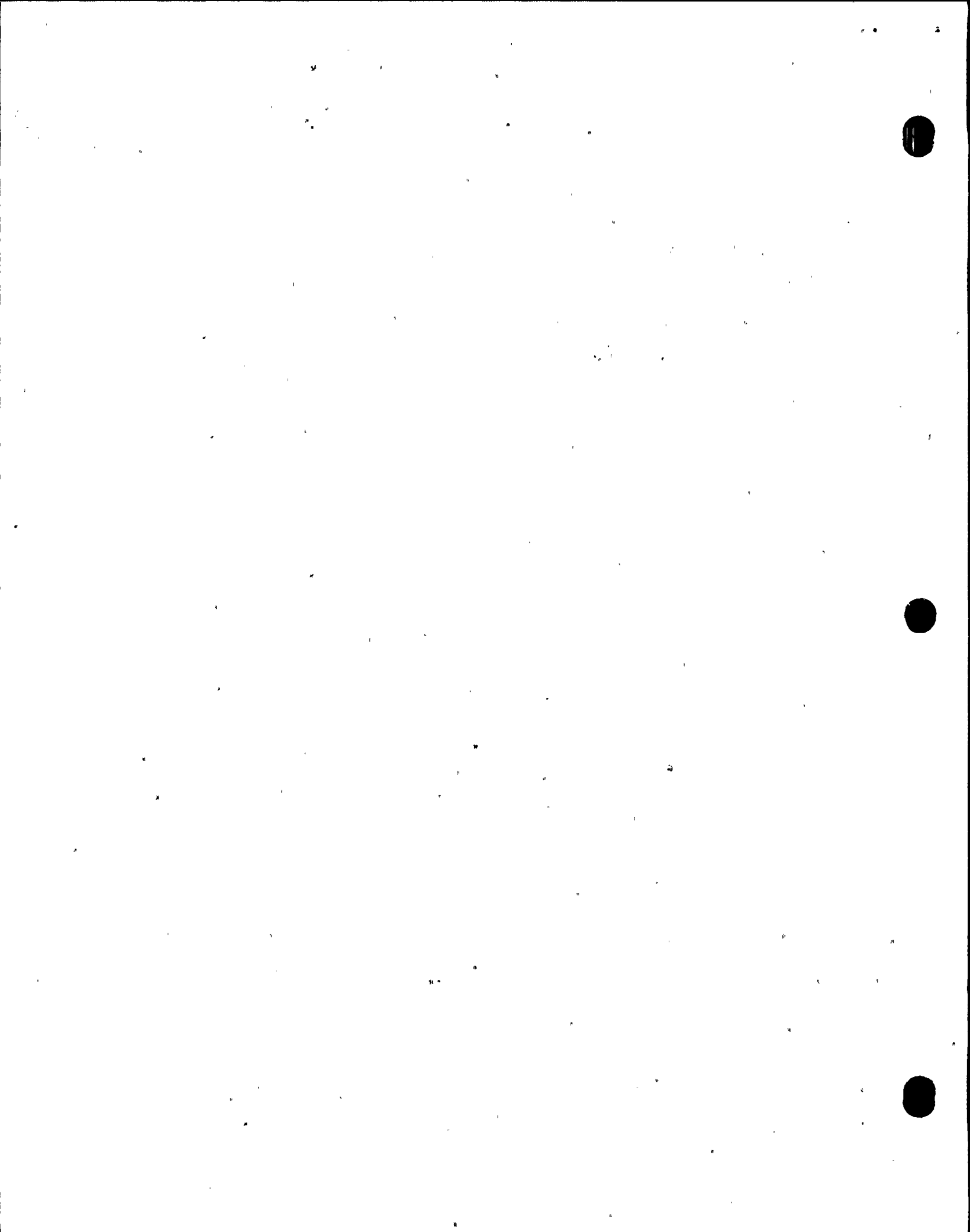
QUESTION: 039 (1.00)

The following conditions exist:

- A loss of RPS Bus "A" has occurred
- Restoration of power to RPS Bus "A" is complete.
- ONE of the four white scram lights for RPS Bus "A" will not reenergize.
- The light bulb is not burned out.
- All RPS "B" white scram lights are energized.
- The Backup/Group Pilot Scram System Power Failure alarm for RPS "A" has alarmed.

Which of the following describes the current status of the control rods?

- a. 1/4 of control rod scram solenoids fed by RPS "A" are receiving alternate power.
- b. 1/4 of control rod scram solenoids fed by RPS "A" should have scrambled.
- c. 1/4 of all control rods should have scrambled.
- d. 1/4 of all control rods have received a 1/2 scram.



QUESTION: 040 (1.00)

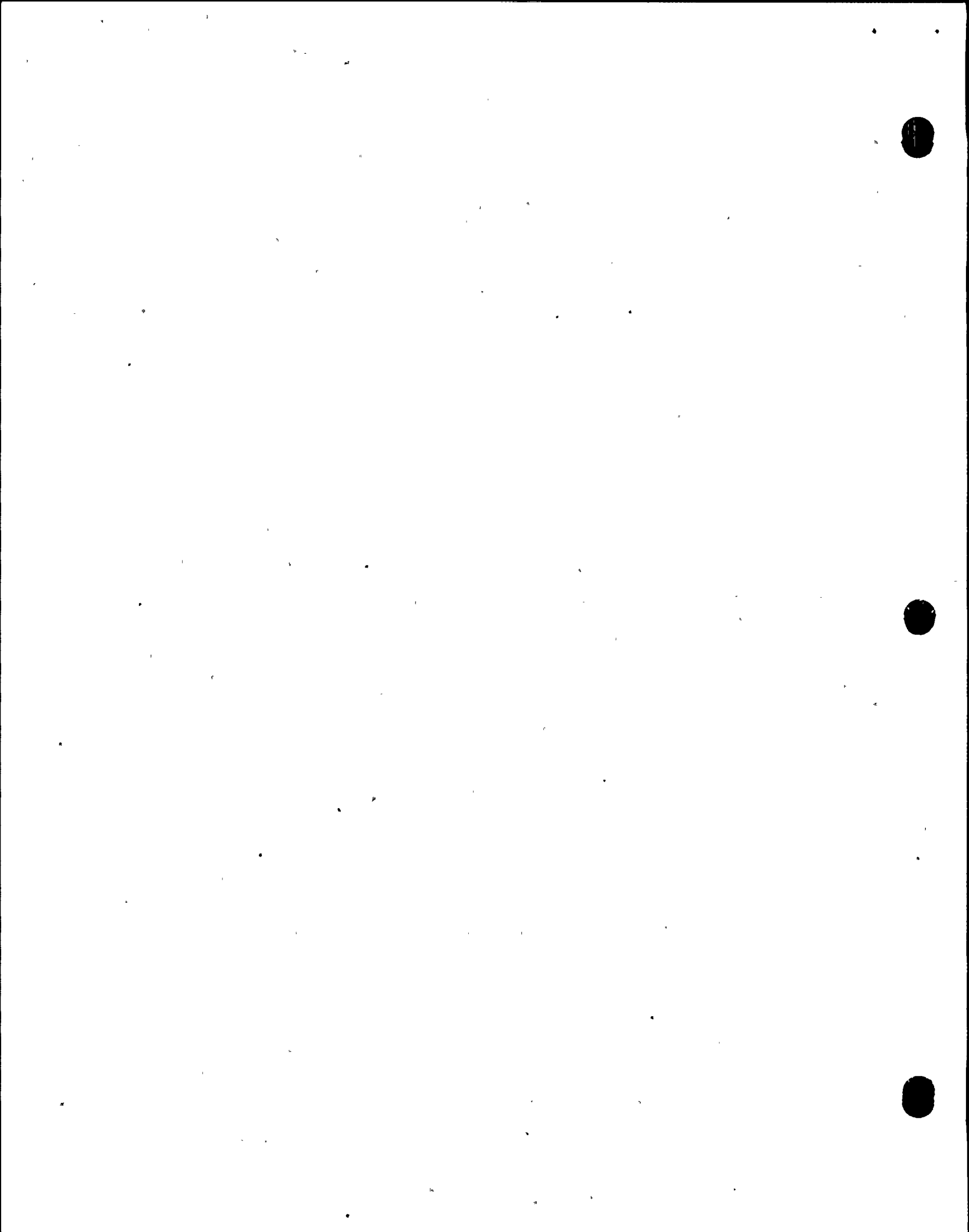
With the reactor initially at 100% power, which of the following would be an indication of an open Safety Relief Valve?

- a. Feedwater temperature decrease.
- b. Total indicated steam flow increase.
- c. Generator power (MWE) increase.
- d. Reactor power decrease.

QUESTION: 041 (1.00)

Which of the following is a Safety Limit violation?

- a. Steam dome pressure reaches 1340 psig with irradiated fuel in the vessel.
- b. MCPR reaches 1.07 during a loss of feedwater heating transient from full power.
- c. Reactor mode switch is placed in RUN with steam dome pressure less than 785 psig.
- d. Steam dome pressure is less than 785 psig with core flow greater than 10 million lbm/hr.



QUESTION: 042 (1.00)

A Traversing In-Core Probe (TIP) trace is in progress during which a NSSS isolation on high drywell pressure occurs.

What is the expected AUTOMATIC response of the TIP system?

- a. The TIP Probe will withdraw to the shield chamber followed by ball valve closure.
- b. The TIP Probe will withdraw to the shield chamber followed by the shear valve closure.
- c. The TIP Probe will withdraw to the drive mechanism followed by shear valve closure.
- d. The TIP ball valve and shear valve will close, if the detector is in the guide tube.

QUESTION: 043 (1.00)

The Traversing In-core Probe (TIP) detectors are normally stored:

- a. within the reactor vessel but below the core.
- b. inside the drive mechanism within the TIP room.
- c. inside a shield chamber but outside primary containment.
- d. within the indexing mechanism inside primary containment.

QUESTION: 044 (1.00)

With the keylock in NORMAL, a loss of rod position signal from the selected rod to the Rod Worth Minimizer will cause:

- a. only a "SYSTEM ERROR" display.
- b. only a withdraw block if power is less than the Low Power Set Point.
- c. a withdraw and insert rod block if power is less than the Low Power Set Point.
- d. a withdraw and insert rod block at any power.

QUESTION: 045 (1.00)

Select the source of the signal used to generate the Low Power Set Point for the Rod Worth Minimizer.

- a. Total steam flow from the Feedwater Level Control System.
- b. Total feed flow from the Feedwater Level Control System.
- c. The lowest of either feed flow or steam flow from the Feedwater Level Control System.
- d. Lowest reading Average Power Range Monitor channel.

QUESTION: 046 (1.00)

During power reduction, which of the following Reactor Protection System automatic scrams is bypassed by taking the mode switch from RUN to STARTUP?

- a. Turbine Stop Valve Closure.
- b. Turbine Control Valve Fast Closure.
- c. Main Steam Line Isolation Valve Closure.
- d. Scram Discharge Volume Water Level High.

QUESTION: 047 (1.00)

Select the Reactor Protection System scram input that is required to be operable in ALL Operational Conditions.

- a. APRM Inoperative.
- b. Mode switch in SHUTDOWN.
- c. Main steam line pressure low.
- d. Scram Discharge Volume Water Level High.

QUESTION: 048 (1.00)

With both recirculation pumps speeds matched at 100% power, which of the following is indication of a reactor recirculation jet pump failure (loss of the nozzle)?

Indicated recirculation loop flow in the loop with the failed jet pump will:

- a. decrease and the failed jet pump D/P indication will be more noisy than others.
- b. decrease and main generator output will decrease.
- c. increase and indicated total core flow will increase.
- d. increase and core thermal power will increase.

QUESTION: 049 (1.00)

The following conditions exist:

- A reactor startup is in progress.
- The mode switch is in STARTUP.
- The main turbine is tripped.
- A valid MSIV isolation has occurred.
- The reactor did not scram (No ATWS condition exists).

Which of the following was the only signal that could have generated the MSIV isolation?

- a. Reactor vessel water level low.
- b. Main steam line pressure low.
- c. Main steam line radiation high.
- d. Main steam line flow high.

QUESTION: 050 (1.00)

Which of the following are DC powered and must energize to operate in order to perform the intended function during a scram?

- a. Scram dump valves (F009 and F182).
- b. Backup Scram valves (110A and 110B).
- c. Scram pilot valve solenoids (117 and 118).
- d. SDV vent and drain valves (F010, 011, 180, 181).

QUESTION: 051 (1.00)

While at 100% power, which of the following describes the effect on the Alternate Rod Insertion (ARI) system of manually actuating ONLY one ARI division?

The ARI system will:

- a. reposition one ARI valve in each vent and supply path.
- b. not reposition any valves unless the other division is also actuated.
- c. vent the air header but not isolate the air supply path.
- d. initiate to cause a reactor scram.

QUESTION: 052 (1.00)

Which of the following will NOT reposition any of its automatic isolation valves until both divisions of their control logic have lost power?

- a. Reactor Core Isolation Cooling valves.
- b. Residual Heat Removal valves.
- c. Main Steam Isolation valves.
- d. Reactor Water Cleanup valves.

QUESTION: 053 (1.00)

An ATWS has occurred and the following conditions exist:

- | | |
|-----------------------------|------------------------------|
| - Reactor power | - 20% on APRMs |
| - Reactor water level | - 30 inches |
| - Drywell pressure | - 1.1 psig |
| - All scram valves | - open |
| - SDV vent and drain valves | - closed |
| - Mode switch | - in SHUTDOWN |
| - SDV water level | - high level scram signal in |

Which of the following describes resetting of the scram to allow draining of the Scram Discharge Volume (SDV) under these conditions?

- The scram can be reset by placing the mode switch in STARTUP and the SDV high water level bypass keylock switch in BYPASS.
- The scram can be reset 10 seconds after the mode switch is placed in SHUTDOWN.
- The scram can be reset by placing the Scram Discharge Volume Bypass switch in BYPASS.
- The scram cannot be reset unless RPS trips are bypassed IAW ES-158-002, when directed by EO-100-113, "Control Rod Insertion".

QUESTION: 054 (1.00)

At the Remote Shutdown Panel (C201), all the Safety Relief Valve (SRV) Control Transfer Switches located on that panel have been placed in "EMERGENCY".

How does this affect the SRV operation if a valid ADS signal is subsequently generated?

- Only three SRVs will open.
- Only the transferred SRVs will open.
- None of the SRVs will open.
- Six SRVs will open.

QUESTION: 055 (1.00)

The following conditions exist:

- The mode switch is in RUN.
- IRM "A" becomes INOP due to High Voltage low.
- IRM "A" is NOT in BYPASS.

Which of the following will subsequently cause a trip of RPS "A"?

- a. Placing IRM "A" in BYPASS.
- b. An IRM "A" downscale signal.
- c. Placing the mode switch in STARTUP.
- d. Placing IRM "A" in BYPASS with APRM channel "A" in BYPASS.

QUESTION: 056 (1.00)

The reactor vessel flange and head flange temperatures must be greater than or equal to 70 degrees F:

- a. at all times.
- b. whenever the head bolt studs are under tension.
- c. only in Operational Condition 4.
- d. whenever there is fuel in the vessel.

QUESTION: 057 (1.00)

In order to minimize vibration within the RHR heat exchanger when operating in the shutdown cooling mode:

- a. the RHR Heat Exchanger Bypass Valve F048 must be throttled at the minimum open position.
- b. the RHR Outboard Injection Valve F017 must be opened greater than the minimum throttle position.
- c. RHR Pump flow should be kept above 4000 gpm with the F017 valve closed.
- d. RHR Pump flow should be kept below 10,000 gpm with the F048 valve closed.

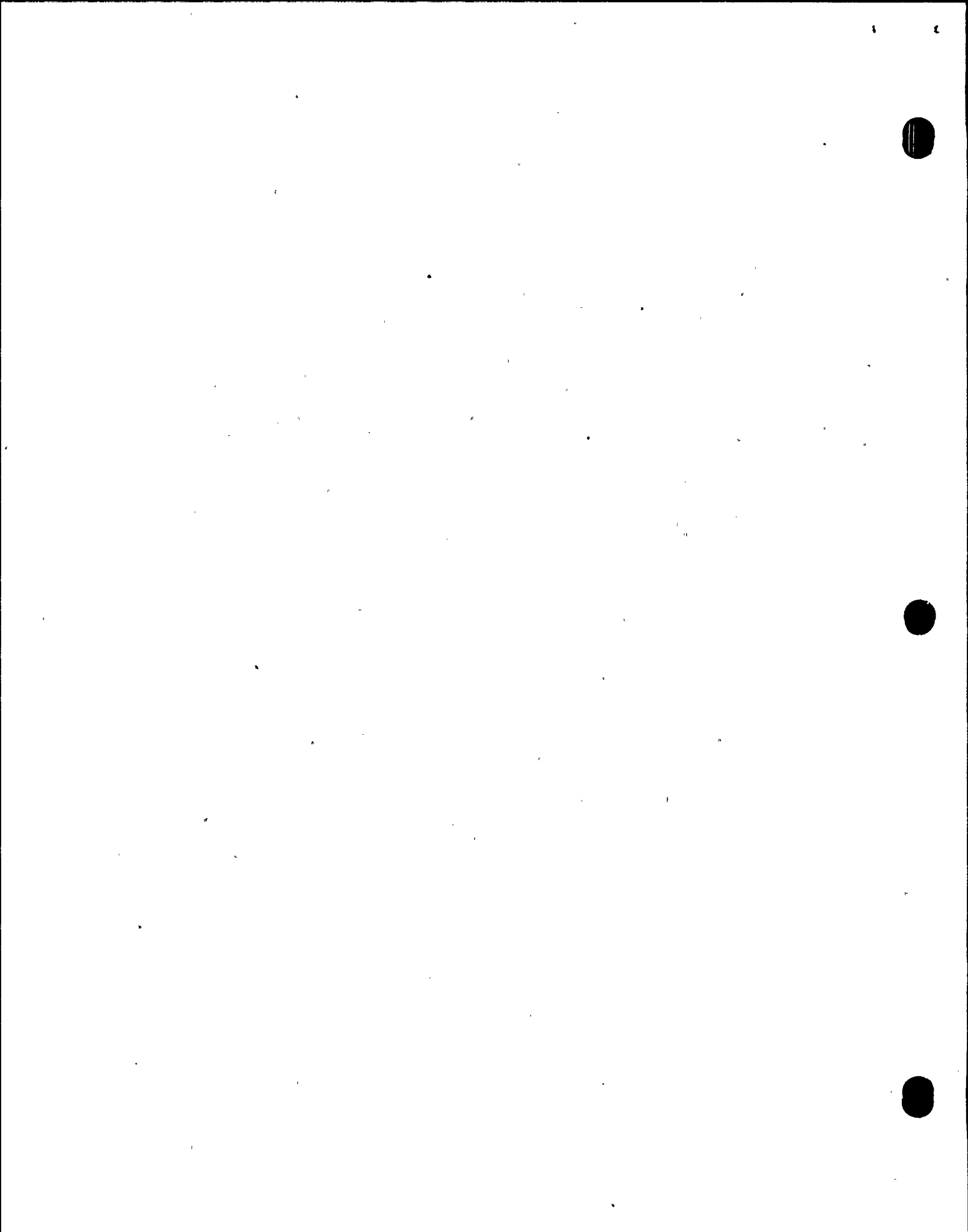
QUESTION: 058 (1.00)

The following conditions exist while at power:

- The High Pressure Coolant Injection (HPCI) system was started up component by component.
- A Nuclear Plant Operator reports that there is a steam leak on the HPCI turbine.
- The Unit Supervisor directs the Plant Control Operator to manually isolate HPCI.

Which of the following would be the expected result if the PCO depresses the "Manual Isolation" pushbutton?

- a. The HPCI system will continue to operate.
- b. A full HPCI system isolation and turbine trip occurs.
- c. Only the Steam Supply valve F001 and Turbine Stop valve HV-15012 will close.
- d. Steam Supply Outboard Isolation valve F003 will close and the HPCI turbine trips.



QUESTION: 059 (1.00)

Which of the following RCIC mechanical and electrical overspeed and HPCI mechanical overspeed trips require local manual reset at the turbine?

- a. Only RCIC mechanical overspeed trip.
- b. RCIC mechanical and electrical overspeed and HPCI mechanical overspeed trips.
- c. RCIC mechanical and electrical overspeed trips.
- d. Only HPCI mechanical overspeed trip.

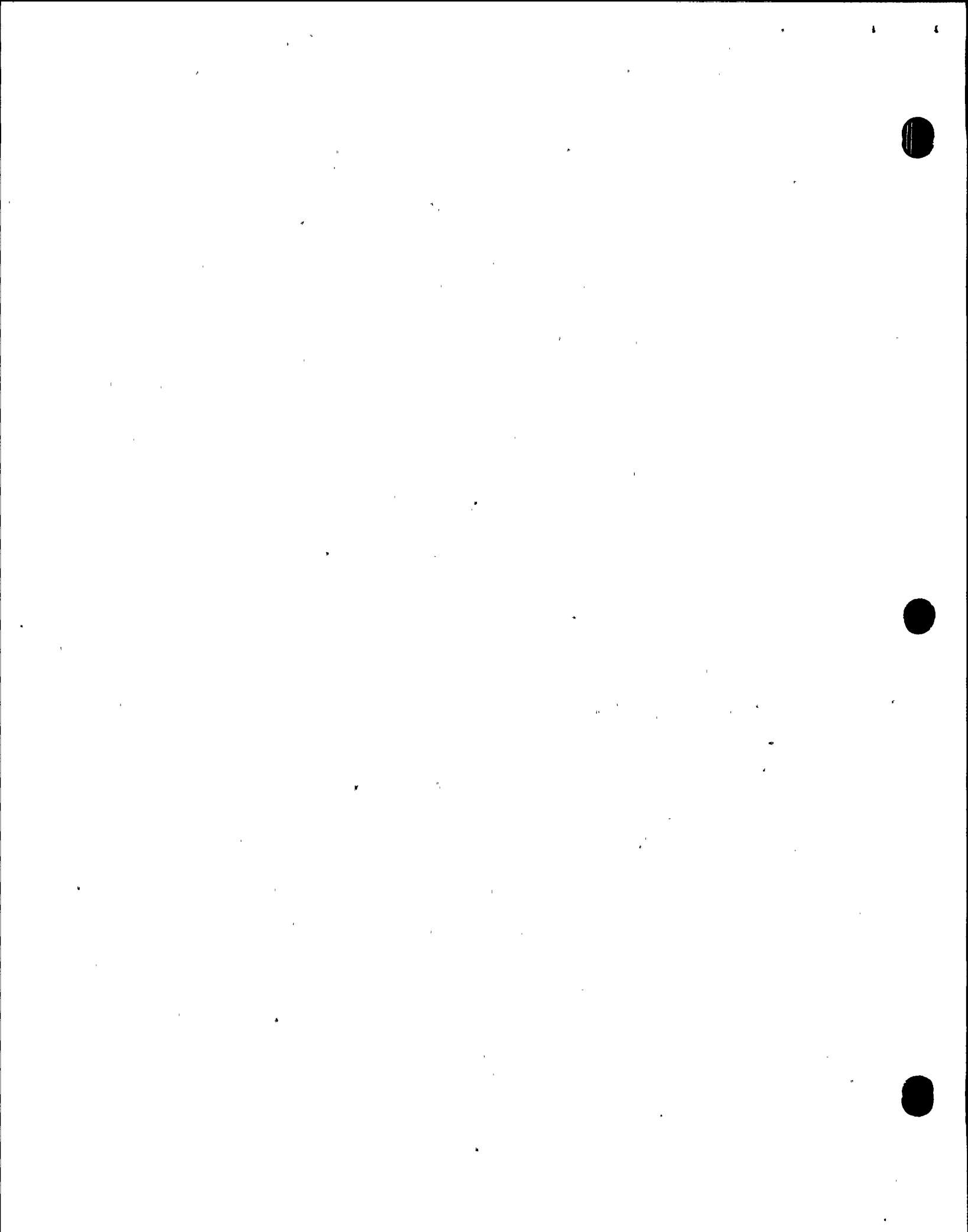
QUESTION: 060 (1.00)

The following conditions exist during a Station Blackout (no incoming or diesel AC power):

- The Reactor Core Isolation Cooling (RCIC) system was started in response to a valid initiation signal.
- A valid RCIC isolation signal is subsequently generated.

Which of the following would be the expected result?

- a. The RCIC system will continue to operate.
- b. A full RCIC system isolation and turbine trip occurs.
- c. The Steam Supply Inboard Isolation valve F007 will close and turbine trip occurs.
- d. The Steam Supply Outboard Isolation valve F008 will close and turbine trip occurs.



QUESTION: 061 (1.00)

When at power, select the affect on the plant, if both trains of the Standby Gas Treatment System are inoperable.

- a. Required Reactor Building pressure can no longer be maintained.
- b. Secondary Containment Integrity is no longer assured.
- c. Primary Containment Integrity is no longer assured.
- d. Required Drywell pressure will be lost if venting is attempted.

QUESTION: 062 (1.00)

The following conditions exist:

- The reactor has scrammed.
- Level Setpoint Setdown has actuated.
- Reactor water level has stabilized at +18 inches.
- No operator actions have been taken regarding the feedwater level control system.
- The operator then depresses the "SETPOINT SETDOWN" reset button for five seconds and then releases it.

What is the expected plant response?

- a. The Level Setdown will clear and level will stabilize at +18 inches.
- b. The Level Setdown will not clear and level will remain at +18 inches throughout the evolution.
- c. The Level Setdown will clear and Reactor Feed Pump speed will increase to raise reactor water level to +35 inches.
- d. The Level Setdown will not clear and level will stabilize at +18 inches, but while the button is depressed Reactor Feed Pump speed will increase to attempt to raise level to +35 inches.

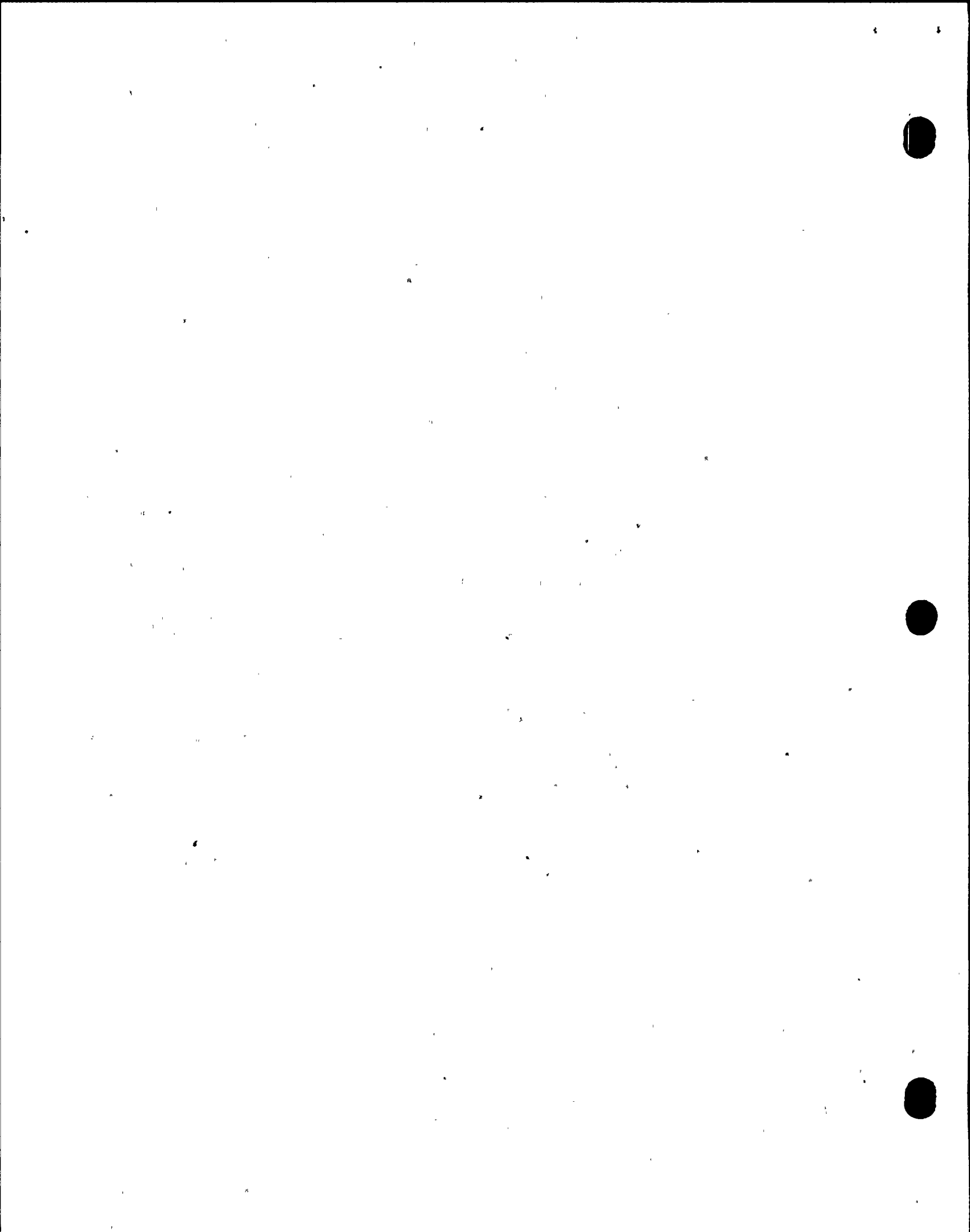
QUESTION: 063 (1.00)

The following conditions exist:

- Both plants are operating at power.
- The Standby Gas Treatment System (SGTS) is in the standby lineup.
- A valid SGTS system initiation signal is received from Unit 2 high drywell pressure.

SELECT the location from which the SGTS will automatically take suction.

- a. Unit 2 Drywell and Suppression Chamber.
- b. Both units Drywell and Suppression Chambers.
- c. Reactor Building Recirculation Supply Plenum.
- d. Unit 2 Drywell and Unit 2 HPCI Barometric Condenser.



QUESTION: 064 (1.00)

A reactor shutdown is in progress and the following conditions exist:

- Reactor power - 10% and decreasing
- Reactor water level - 30 inches
- Reactor pressure - 1000 psig
- Mode switch - in RUN
- APRMs/IRMs bypassed - None

Both divisions of the 24 VDC power system (D670 and D680) become deenergized.

Which of the following states the effect?

- a. A one half MSIV isolation signal exists.
- b. A reactor scram will occur if the mode switch is placed in STARTUP.
- c. A reactor scram will occur when APRM power decreases below 3%.
- d. Reactor power decrease MUST be stopped until SRMs are operable.

QUESTION: 065 (1.00)

While at power, if both seals on one reactor recirculation pump experience gross failure, the MAXIMUM increase in leak rate to the containment (equipment sump) could reach approximately:

- a. 0.75 gpm.
- b. 2.0 gpm.
- c. 20 gpm.
- d. 40 gpm.

QUESTION: 066 (1.00)

Which of the following describes the effect on Reactor Recirculation Pump operation when the Alternate Rod Insertion (ARI) system is manually initiated instead of automatically initiated?

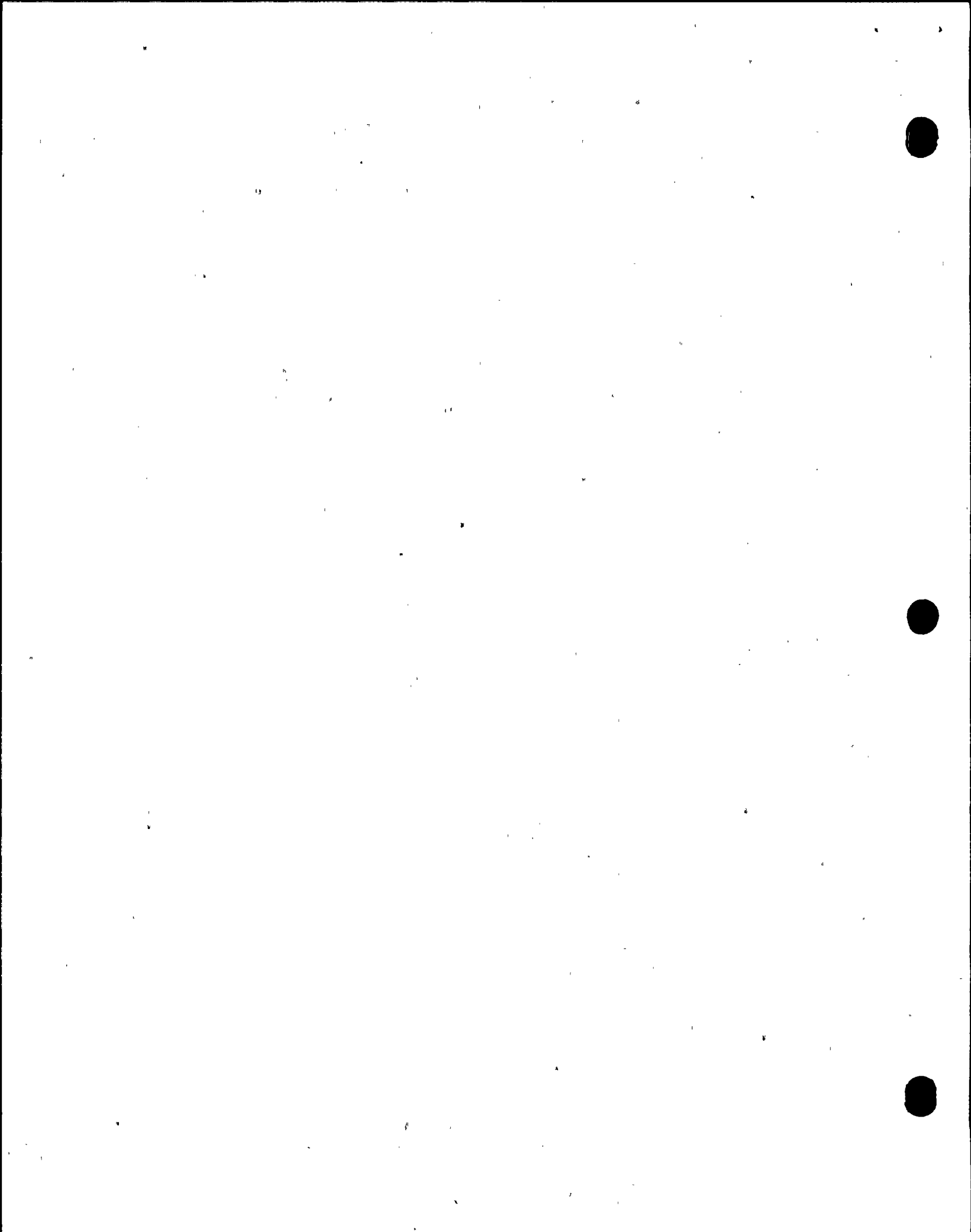
- a. The recirculation pumps trip immediately.
- b. The recirculation pumps do not automatically trip.
- c. Only the generator field breakers receive a direct trip.
- d. The recirculation pumps trip after a 15 second time delay.

QUESTION: 067 (1.00)

Select the set of conditions for which ALL reactor water level indicators should be considered invalid:

INSTRUMENT RUN/DRYWELL TEMPERATURE - RPV PRESSURE

- a. 200 degrees F, 30 psig
- b. 325 degrees F, 90 psig
- c. 350 degrees F, 100 psig
- d. 400 degrees F, 250 psig



QUESTION: 068 (1.00)

A Safety Relief Valve (SRV) tailpiece vacuum breaker has failed in the open position during SRV operation.

Which of the following will result?

- a. Steam bypassing the quenchers with a direct discharge path into the suppression pool water.
- b. Direct pressurization of the drywell air space each time the SRV is opened.
- c. Suppression pool water being drawn up into the SRV tailpiece line after the SRV is closed.
- d. Incorrect relief mode setpoints for this SRV due to reduced back pressure.

QUESTION: 069 (1.00)

With the reactor at 75% power, which of the following, by itself, will result in an automatic runback of the recirculation pumps?

- a. Main turbine trip.
- b. Reactor water level high.
- c. Reactor Feed Pump trip.
- d. Circulating Water Pump protective trip.

QUESTION: 070 (1.00)

The following conditions exist three days after shutdown from 100% power operation:

- The reactor is in Operational Condition 4 to replace a recirculation pump seal.
- The plant has experienced a Station Blackout (no incoming or diesel AC power).
- Reactor vessel level is stable at 55 inches.
- Reactor water temperature is 180 degrees F and increasing.

Which of the following is REQUIRED for this situation?

- a. Attempt to establish a steam flow path to the main condenser.
- b. Establish primary containment before exceeding 200 degrees F.
- c. Immediately open the reactor head vent.
- d. Enter EO-100-103 "Primary Containment Control".

QUESTION: 071 (1.00)

Which of the following describes why operators are cautioned NOT to open Reactor Water Cleanup valves, Blowdown to the Condenser (F034) and the Blowdown to Rad Waste (F035), at the same time?

- a. Main condenser vacuum may be reduced.
- b. It will vacuum drag radwaste to the condensate system.
- c. The cleanup pumps may trip on low suction pressure.
- d. The heat exchangers cannot remove sufficient heat to prevent system isolation.

QUESTION: 072 (1.00)

With a LOCA signal present, placing the "LOCA ISOLATION MANUAL OVERRIDE" switch (S17A/B) in "OVERRIDE" will allow opening all of the following valves except:

- a. Drywell Spray Outboard Isolation valve F016A/B.
- b. Suppression Pool Cooling Test Line Control valve F024A/B.
- c. RHR Heat Exchanger Shell Side Bypass valve F048A/B.
- d. Suppression Chamber Spray valve F027A/B.

QUESTION: 073 (1.00)

Shutdown cooling is in operation and being operated from the REMOTE SHUTDOWN PANEL.

Which of the following will isolate RHR Shutdown Cooling Suction Inboard (F009) and Outboard (F008) Isolation valves?

- a. Manual NSSSS actuation.
- b. Reactor low level (+13").
- c. Reactor pressure high (98 psig).
- d. Drywell pressure high (1.68 psig).

QUESTION: 074 (1.00)

The following conditions exist:

- Rods are being withdrawn for a reactor startup.
- Reactor power is 15% (Mwt).
- The mode switch is in RUN.
- The main turbine is operating supplying power.
- The Rod Sequence Control System (RSCS) indicates "Above LPSP (Low Power Setpoint)".
- The Unit Supervisor declares the RSCS to be INOPERABLE.
- No rod blocks are in effect.

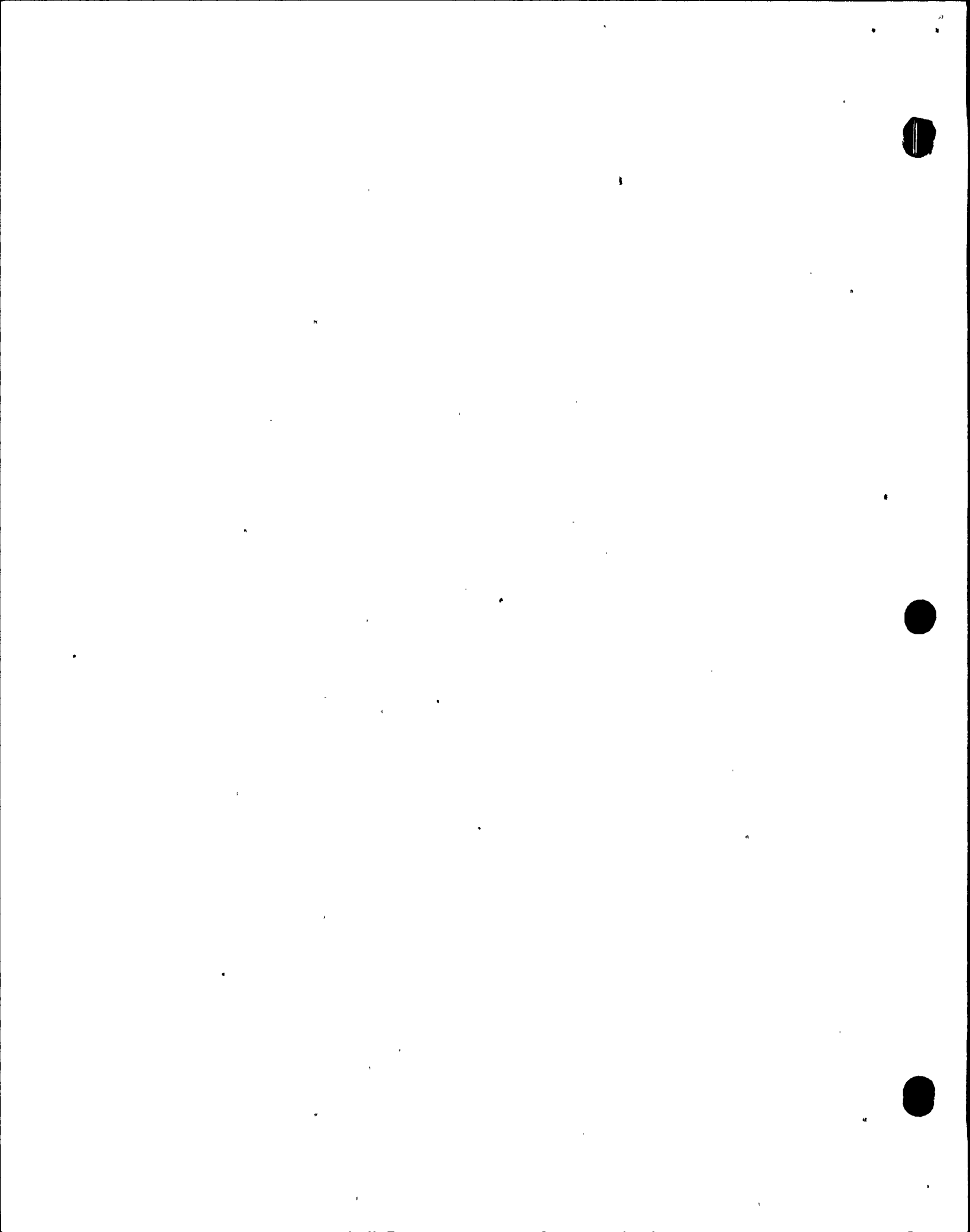
Select the appropriate action.

- a. RSCS is not required, continue rod withdrawal.
- b. Stop all rod movement (except for a scram) until RSCS is operable.
- c. Continue rod withdrawal with verification by a second licensed operator.
- d. Place the RSCS in BYPASS, then continue rod withdrawal.

QUESTION: 075 (1.00)

Select the lowest severity emergency plan classification due to an off-site release that requires entry into the Radioactivity Release Control Emergency Operating Procedure.

- a. General Emergency
- b. Site Area Emergency
- c. Alert
- d. Unusual Event



QUESTION: 076 (1.00)

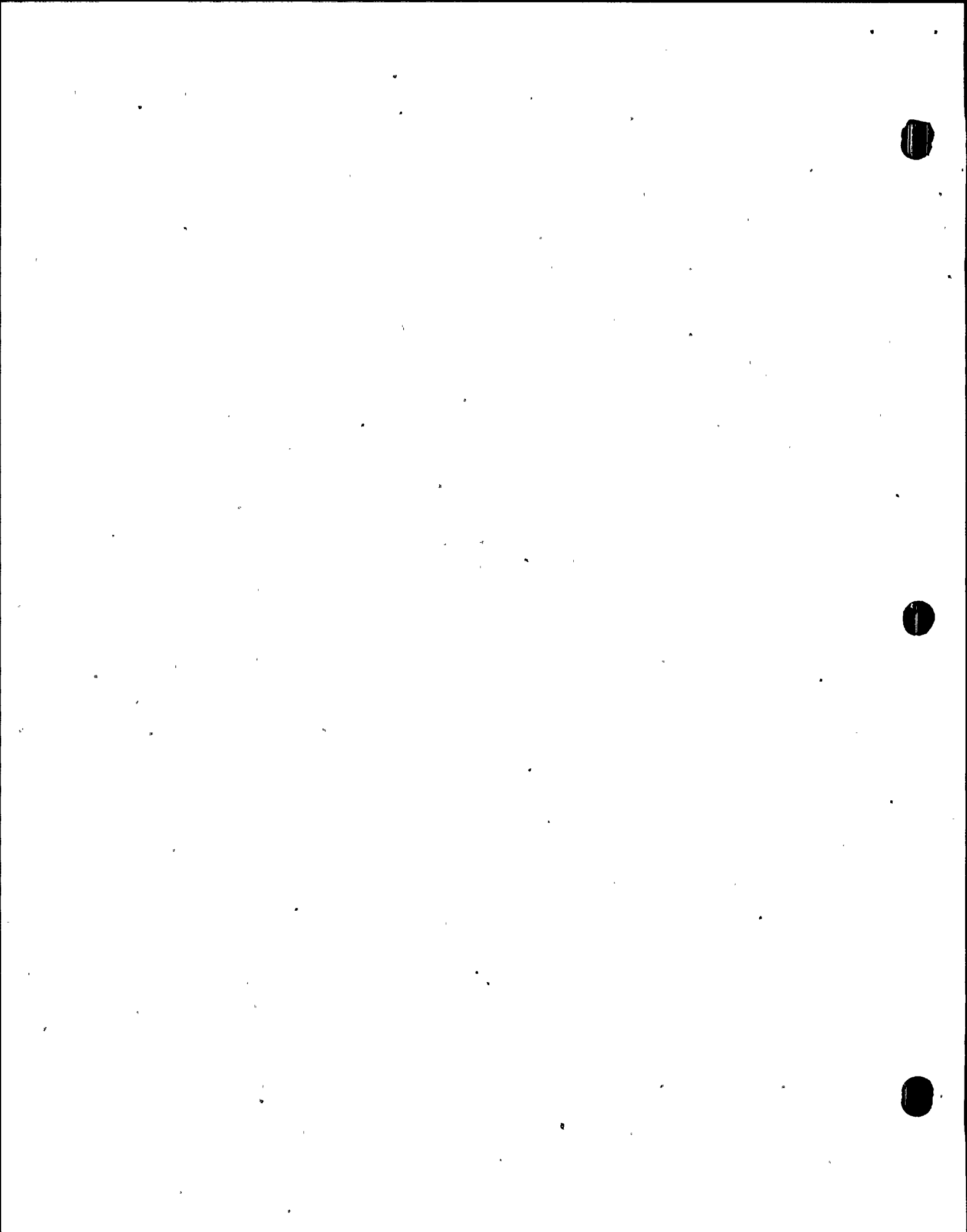
Given the following conditions:

- Plant is at power with reactor pressure at 1000 psig
- Suppression pool temperature is 82 degrees F
- At 0800 one SRV spuriously opens

After attempting to close the SRV by taking its control switch to OFF, a check of SRV tailpipe temperature indicates approximately 295 degrees F and stable.

Under these conditions the reactor is allowed to stay at power:

- a. until 0802.
- b. indefinitely.
- c. until suppression pool temperature reaches 110 degrees F.
- d. indefinitely if the safety function of 12 other SRVs are operable.



QUESTION: 077 (1.00)

The plant is operating at 90% power when the following events occur in the order given:

- FW LOOP B PANEL 1C102 TROUBLE alarm
- APRM UPSCALE alarm
- ROD OUT BLOCK alarm
- Feedwater temperature is observed on a downward trend.

Recirculation flow is required to be reduced until:

- a. core flow reaches 55 MLBS/hour without regard to reactor power level.
- b. reactor power decreases by 20% OR the restricted region of the Power/Flow map is reached.
- c. core flow reaches 55 MLBS/hour OR reactor power decreases by 20%.
- d. reactor power decreases by 20% without regard to core flow decrease.

QUESTION: 078 (1.00)

The plant is in Condition 4 with Primary and Secondary Containment established when a loss of shutdown cooling occurs. It is desired to use non-ADS SRVs to maintain reactor pressure and cool the core.

In order to use the SRVs in this manner, reactor pressure must be at least 19 psig because:

- a. the SRVs will not open below 19 psig.
- b. the heat transfer rate below 19 psig will be insufficient to adequately cool the core under worst case power history.
- c. below 19 psig the differential pressure will be insufficient to clear the column of water from the SRV downcomers.
- d. below 19 psig flow through the SRV will be insufficient to determine valve position by acoustic monitor.

QUESTION: 079 (1.00)

A Control Room evacuation is required. All immediate actions were performed prior to evacuation. While you are enroute to the Remote Shutdown Panel, excessive reactor pressure will initially be prevented:

- a. by turbine bypass valves.
- b. by HPCI which was left running in the pressure control mode.
- c. by SRVs in the relief mode.
- d. by SRVs in the safety mode.

QUESTION: 080 (1.00)

With the plant at 20% power, condenser vacuum is gradually being lost and is currently 21 inches Hg Vacuum.

Which of the following automatic actions should have occurred at this point?

- a. Reactor Scram and Main Turbine Trip.
- b. Main Turbine Trip, Reactor Scram and Reactor Feed Pump Turbine Trip.
- c. Main Turbine Trip only.
- d. Reactor Scram only.

QUESTION: 081 (1.00)

Given the following plant conditions:

- Unit 2 was operating at 100% power for the previous 100 days.
- At 0800 an ATWS occurs with no rod motion.
- RPV Level is lowered to -95 inches and RPV pressure is 1050 psig. These values will remain constant.
- At 0900 1800 gallons of boron have been injected and completely mixed. No additional boron is injected.

Which of the following describes the reactor criticality at 0900 and at 1700.

- a. The reactor should be shutdown at 0900 and be more subcritical at 1700.
- b. The reactor should be shutdown at 0900, but should have returned to criticality before 1700.
- c. The reactor should NOT be shutdown at 0900, but will be shutdown before 1700.
- d. The reactor should NOT be shutdown at 0900 and will be at a higher power level at 1700.

QUESTION: 082 (1.00)

During an ATWS RPV level is being controlled between -60 inches and -161 inches with a target band of -80 inches to -110 inches.

Which of the following describes the consequences of operating outside the target band?

If RPV level was allowed to go:

- a. above -80 inches core power would be more responsive to RPV pressure fluctuations.
- b. above -80 inches level control would become more difficult.
- c. below -110 inches adequate core flow to carry liquid poison into the core could be lost.
- d. below -110 inches Wide Range level indication must be assumed lost.

QUESTION: 083 (1.00)

The preferred method to determine control rod positions following a reactor scram is by:

- a. observing full core display.
- b. observing RSCS core display.
- c. demanding an new OD-7 scan.
- d. verifying no withdraw error exists on the Rod Worth Minimizer.

QUESTION: 084 (1.00)

During a loss of both loops of RHR Shutdown Cooling, which of the following is an acceptable method for maintaining adequate flow through the core to prevent thermal stratification?

- a. Raise RPV water level to +50 inches.
- b. Maximize CRD flow and lineup RWCU Reject.
- c. Establish feed and bleed using Condensate Pumps and RWCU Reject.
- d. Establish Core Spray injection from Suppression Pool and return path through 4 SRVs.

QUESTION: 085 (1.00)

With the plant operating at 100% power, a trip of one Reactor Recirculation pump has occurred.

A manual reactor scram is required:

- a. immediately if the second Reactor Recirculation pump trips.
- b. immediately without regard to core flow and power level.
- c. if Region II is entered in order to prevent potential core flux oscillations.
- d. in order to prevent an automatic APRM HI Scram.

QUESTION: 086 (1.00)

Given the following plant conditions:

- The plant is at 100% power.
- The HPCI Equipment Area High Level Alarm has just been reached.
- HPCI Equipment Area Water Level is increasing.

Prior to the HPCI Equipment Area Level reaching the Max Safe Value, entry to RPV Control is required if a system:

- a. containing radioactive water is discharging into Secondary Containment.
- b. without automatic isolation capability is discharging into Secondary Containment.
- c. with a leak rate greater than sump pump capability is discharging into Secondary Containment.
- d. with a leak rate that is dependent on RPV pressure is discharging into Secondary Containment.

QUESTION: 087 (1.00)

Given the following conditions:

- Plant startup is in progress.
- Main generator has been synchronized to the grid and loaded to 100 Mwe.
- The EXCITER FIELD BKR TRIP alarm comes up on panel 1C651.
- Generator load drops to Zero.
- A check of main turbine speed shows that it is remaining constant.
- The main trubine was manually tripped.

Select the required action.

- a. Start turning gear oil pump (TGOP) and motor suction oil pump (MSOP).
- b. Close all MSIVs.
- c. Open bypass valves as necessary to lower pressure and close turbine control valves.
- d. Break Main Condenser vacuum using the Condenser Vacuum breakers.

QUESTION: 088 (1.00)

With an increasing primary containment pressure, emergency operating procedures require the initiation of suppression chamber sprays.

In order to initiate suppression chamber sprays, suppression pool level must be less than 49 feet in order to prevent:

- a. submergence of the vacuum breaker valves.
- b. exceeding the SRV Tail Pipe Level limit.
- c. submergence of the suppression chamber spray nozzles.
- d. exceeding the Primary Containment Pressure limit.

QUESTION: 089 (1.00)

The plant is in Operational Condition 4 when the 'A' and 'C' ESW pumps are declared operable.

Which of the following list of systems/components must always be declared inoperable?

- a. RHR Pumps 'A' and 'D'
- b. RHR Pumps 'A' and 'B', EDG 'A' and 'B'
- c. RHR Pumps 'A' and 'C', EDG 'A' and 'C'
- d. Core Spray Pumps 'A' and 'B', RHR Pumps 'A' and 'B'

QUESTION: 090 (1.00)

Given the following conditions on Unit 1:

- The plant is at 100% power on the 100% rod line.
- The Total Feedwater Flow Instrument failed downscale.
- APRM/LPRM readings are not oscillating.

(Unit 1 Power/Flow Map is provided.)

Select the required actions.

- a. Ensure Reactor Recirculation pumps run back to 30% speed.
Increase Core Flow to <55 Mlbm/hr.
- b. Ensure Reactor Recirculation pumps run back to 45% speed.
Increase Core Flow to <55 Mlbm/hr.
- c. Ensure Reactor Recirculation pumps run back to 30% speed.
Insert control rods until below 80% rod line.
- d. Ensure Reactor Recirculation pumps run back to 45% speed.
Insert control rods until below 80% rod line.



QUESTION: 091 (1.00)

Identify the reason injection is prevented until level is less than -60 inches during an ATWS with reactor power greater than 5%.

- a. Lowering level below the moisture separator removes the flowpath to the annulus which minimizes flow through the core.
- b. Lowering level increases the differential pressure between outside the shroud and inside the core which minimizes flow through the core.
- c. Lowering level decreases core voiding which minimizes power oscillations.
- d. Lowering level decreases inlet subcooling which minimizes power oscillations.

QUESTION: 092 (1.00)

The Primary Containment Control Emergency Operating Procedure requires that "When RPV pressure and suppression pool level cannot be maintained below the SRV tailpipe level limit, stop injection from sources external to primary containment not required to assure adequate core cooling except boron injection systems and CRD."

RCIC is aligned to its alternate suction. All other systems are aligned to their normal suction.

If adequate core cooling can be assured which of the following systems should be secured?

- a. Core Spray and ECCS Keep-Fill
- b. HPCI and Standby Liquid Control Demin Crosstie
- c. Low Pressure Coolant Injection and RHR SDC Suction Fill
- d. RCIC and ECCS Keep-Fill

QUESTION: 093 (1.00)

Given the following conditions:

- A plant startup is in progress.
- The running CRD pump trips.
- The standby CRD pump cannot immediately be started.
- An NPO is investigating.
- The following control rod positions exist:

Rod 18-43	Position 00
Rod 42-19	Position 00
Rod 42-43	Position 24
Rod 18-19	Position 48

Which of the following conditions would require a manual reactor scram?

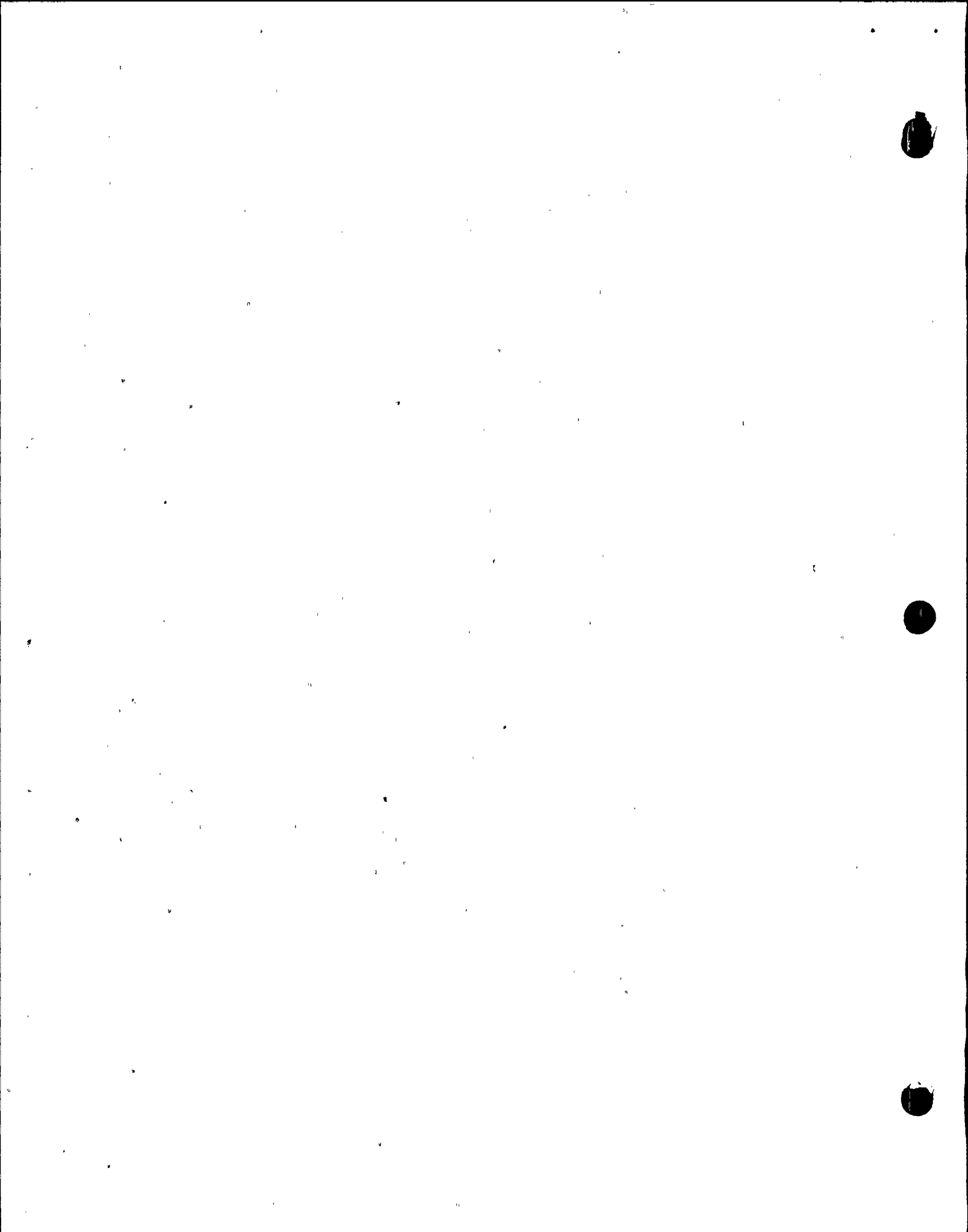
- a. Rod 18-19 accumulator alarm comes in.
- b. Rod 42-43 accumulator alarm comes in.
- c. Rod 18-43 and Rod 42-19 accumulator alarms come in.
- d. Rod 42-43 and Rod 18-19 accumulator alarms come in.

QUESTION: 094 (1.00)

With the plant at 100% power, a spurious main steam isolation occurred which resulted in a reactor scram. Reactor water level dipped to Zero inches and is slowly being recovered to +30 inches.

In this condition the maximum reactor pressure that should be maintained is:

- a. 1000 psig.
- b. 1087 psig.
- c. 1108 psig.
- d. 1175 psig.



QUESTION: 095 (1.00)

A fire occurred in the control room requiring evacuation before any control room actions could be performed.

Select the method used for inserting control rods from outside the control room.

- a. Opening breakers in RPS power distribution panels.
- b. Removing RPS fuses in accordance with ES-158-001.
- c. Opening RPS EPA breakers.
- d. Venting the scram air header.

QUESTION: 096 (1.00)

Unit 1 is at 100% power when a loss of ESS Channel 'A' 125 VDC Distribution Panel 1D614 occurs. This results in loss of close position indication on RPT breakers 3A and 3B and inoperable EOC-RPT and ATWS-RPT Div 1 trip logic.

Select the expected response of the Reactor Recirculation System.

- a. Pump 1A trips and Pump 1B continues to run.
- b. Pumps 1A and Pump 1B both trip.
- c. Pump 1A continues to run and Pump 1B trips.
- d. Pumps 1A and 1B both continue to run.

QUESTION: 097 (1.00)

During an ATWS, level has been lowered to -62 inches and Table 15 systems are being used to maintain level between -60 inches and -161 inches.

In this condition, which of the following systems would be PREFERRED for controlling level?

- a. HPCI and RCIC with each taking suction from CST.
- b. HPCI taking suction from CST and LPCI with injection through Heat Exchanger.
- c. RCIC taking suction from CST and CRD maximized as necessary.
- d. RCIC taking suction from CST and LPCI with injection through Heat Exchanger.

QUESTION: 098 (1.00)

Given the following conditions:

- An APRM Hi Flux scram occurs. All rods insert fully.
- A trip of both Reactor Recirculation pumps subsequently occurs.
- ON-100-101, Scram, is being executed.
- RPV Steam Dome temperature is 525 degrees F.
- RPV Bottom Head Drain temperature is 375 degrees F.

Under these conditions, ON-100-101, Scram, directs the operator to maintain reactor water level between:

- a. +13 and +54 inches.
- b. +13 and +30 inches.
- c. +45 and +54 inches.
- d. +13 and +45 inches.

QUESTION: 099 (1.00)

A loss of Unit 1 RPS Bus 'B' has occurred. Which of the following automatic actions would result?

- a. Containment Isolation Division 2 only.
Channel 'B' Half Scram.
- b. Containment Isolation Division 2 only.
Failure of Auto Start Capability of SBGT.
- c. Containment Isolation Divisions 1 and 2.
Channel 'B' Half Scram.
- d. Containment Isolation Divisions 1 and 2.
Failure of Auto Start Capability of SBGT.

QUESTION: 100 (1.00)

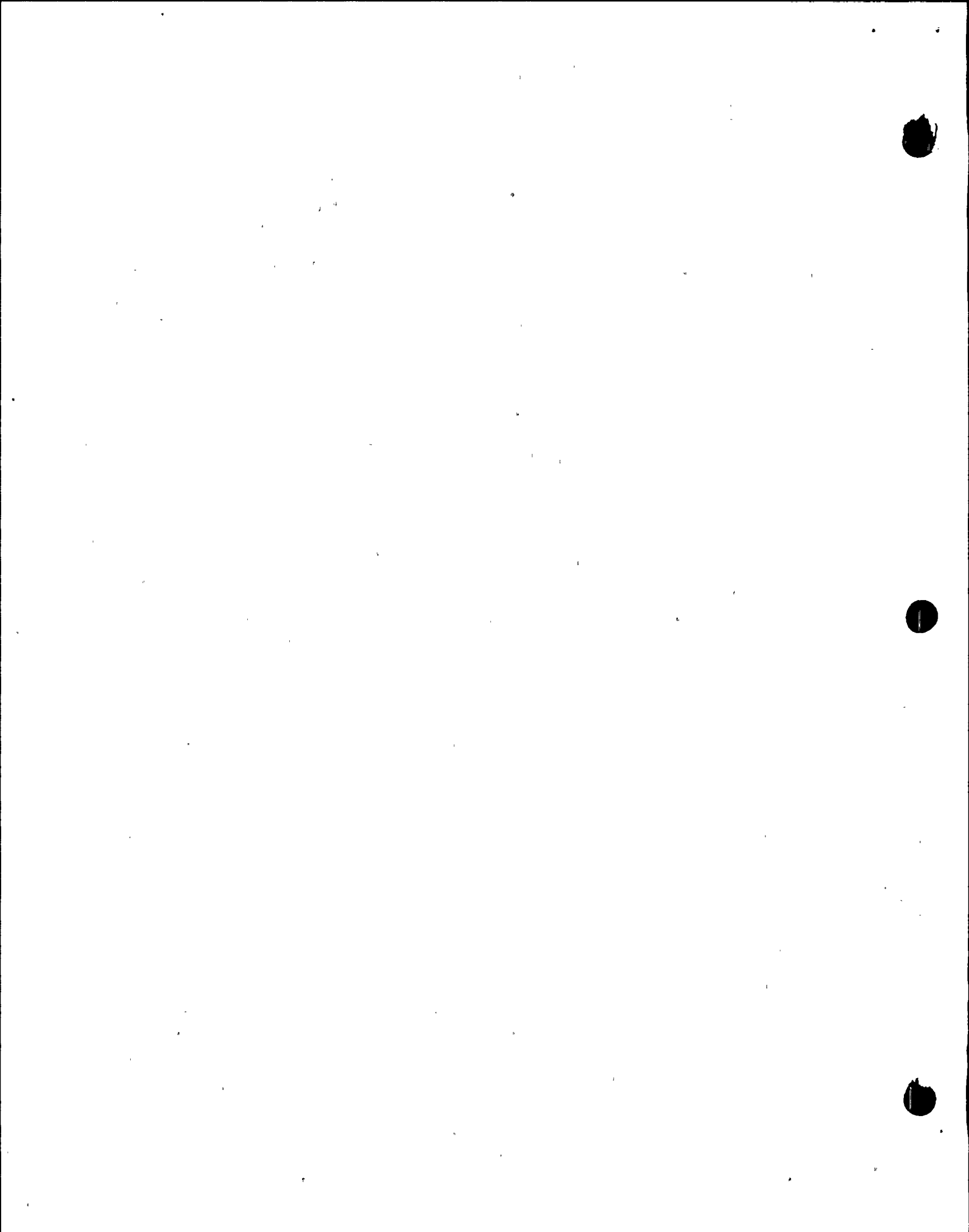
Given the following conditions:

- The plant has experienced a LOCA which resulted in fuel damage.
- Drywell spray cannot be initiated due to one drywell spray valve in each loop being stuck in the closed position.
- The Emergency Director has determined that drywell spray must be initiated immediately in order to reduce containment pressure and limit the escape of radioactive effluents.
- An operator has been designated to enter the reactor building and manually open the drywell spray valves.
- Reactor building radiation levels in the area of the drywell are approximately 50 Rem/hr.

With proper approval, the Total Effective Dose Equivalent for this operator may be extended to a MAXIMUM of:

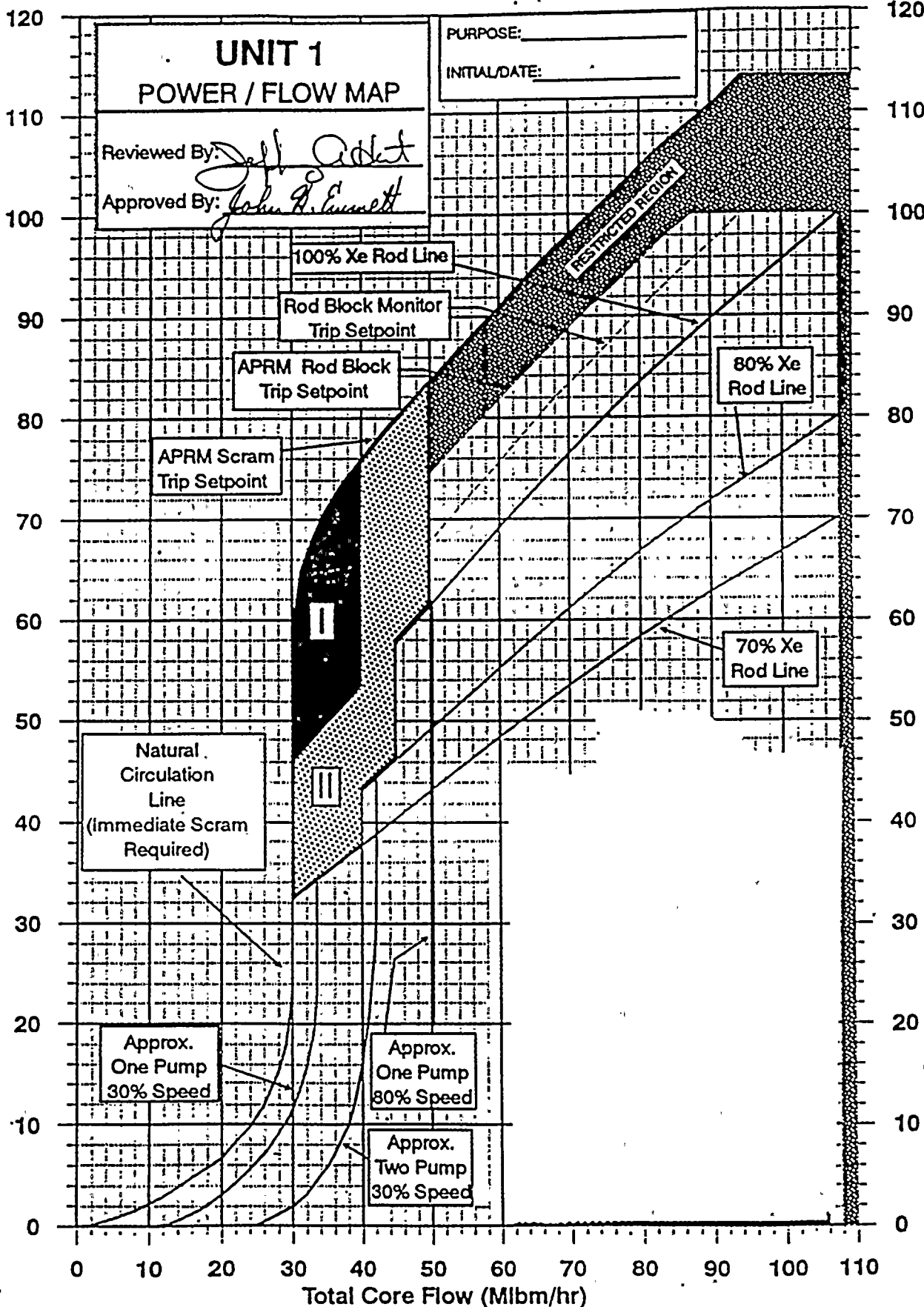
- a. 5 Rem.
- b. 10 Rem.
- c. 25 Rem.
- d. 50 Rem.

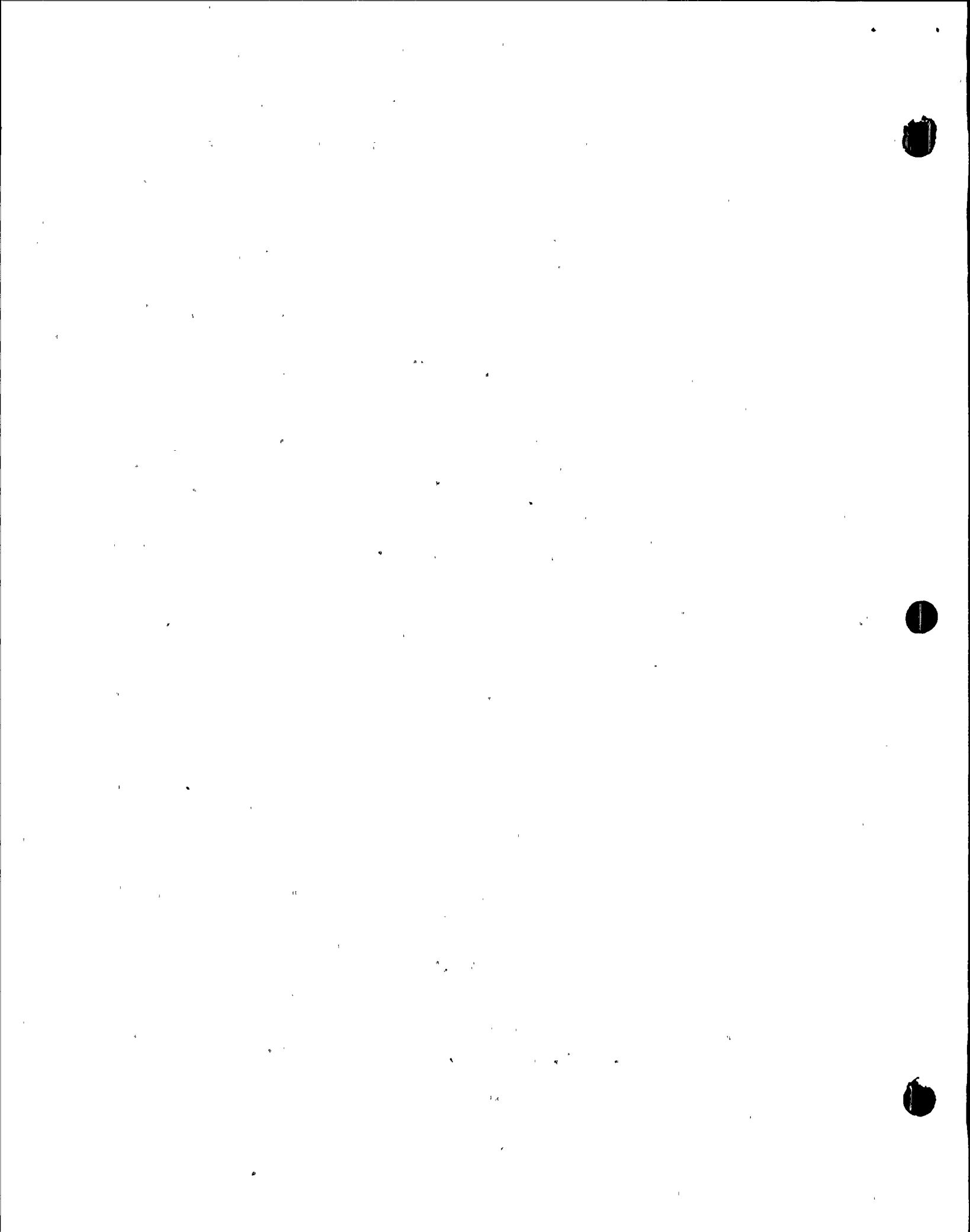
(***** END OF EXAMINATION *****)



UNIT ONE, POWER vs. FLOW MAP

Thermal Power (% RATED)





ANSWER KEY

MULTIPLE CHOICE			
001	c	023	a
002	b	024	d
003	d	025	d
004	c	026	d
005	a	027	c
006	c	028	d
007	d	029	b
008	c	030	b
009	d	031	a/b
010	a	032	a
011	d	033	a
012	b	034	d
013	a	035	d
014	c	036	b
015	c	037	a
016	c	038	c
017	b	039	d
018	b	040	a
019	a/b	041	a
020	c	042	a
021	b	043	c
022	d	044	c
		045	a

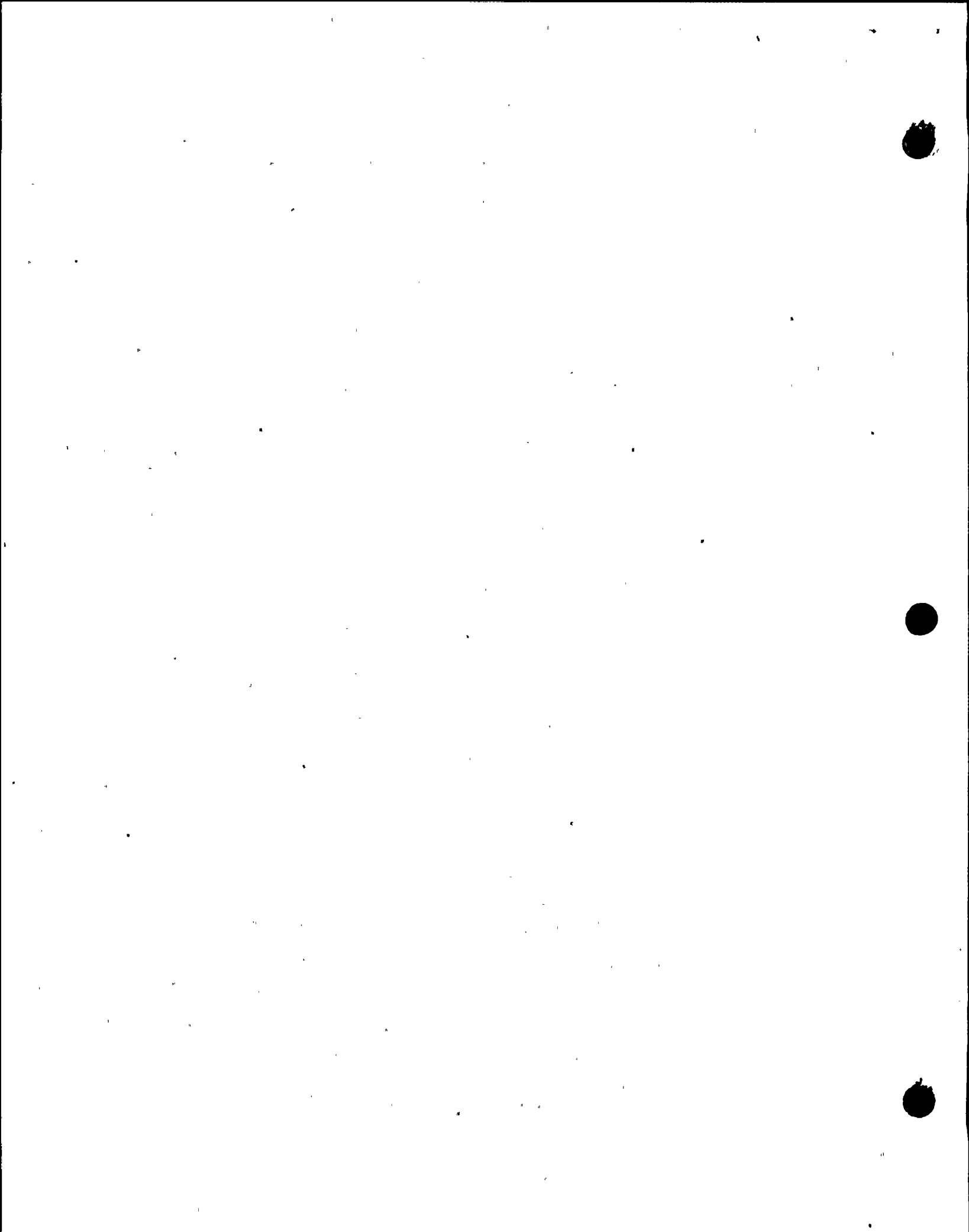
ANSWER KEY

046	c	069	d
047	b	070	b
048	c	071	a
049	d	072	c
050	b	073	c
051	a	074	b
052	c	075	c
053	d	076	a
054	d	077	c
055	c	078	c
056	a/b	079	c
057	d	080	c
058	a	081	a
059	a	082	c
060	d	083	a
061	b	084	a
062	c	085	a
063	c	086	d
064	b	087	b
065	d	088	c
066	b	089	a
067	c	090	c
068	b	091	d

A N S W E R K E Y

- 092 b
- 093 d
- 094 b
- 095 a
- 096 b
- 097 a
- 098 b
- 099 c
- 100 b

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



ATTACHMENT 2*

SRO EXAMINATION AND ANSWER KEY

U. S. NUCLEAR REGULATORY COMMISSION

SITE SPECIFIC EXAMINATION

SENIOR OPERATOR LICENSE

REGION 1

APPLICANT'S NAME: _____

FACILITY: _____ Susquehanna 1 & 2 _____

REACTOR TYPE: _____ BWR-GE4 _____

DATE ADMINISTERED: _____ April 15, 1996 _____

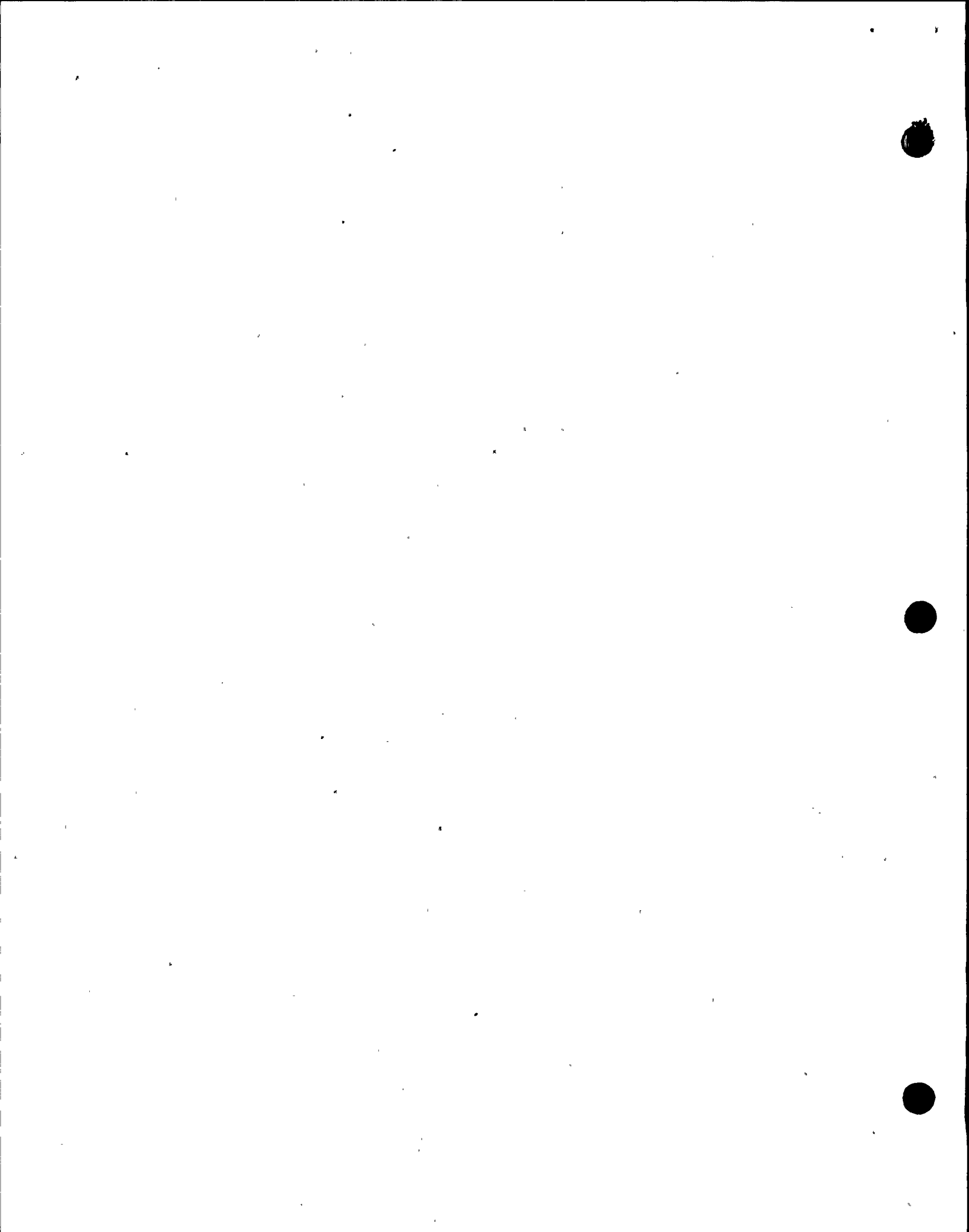
INSTRUCTIONS TO APPLICANT:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

TEST VALUE	APPLICANT'S SCORE	FINAL GRADE
100.00		

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

Applicant's signature



A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

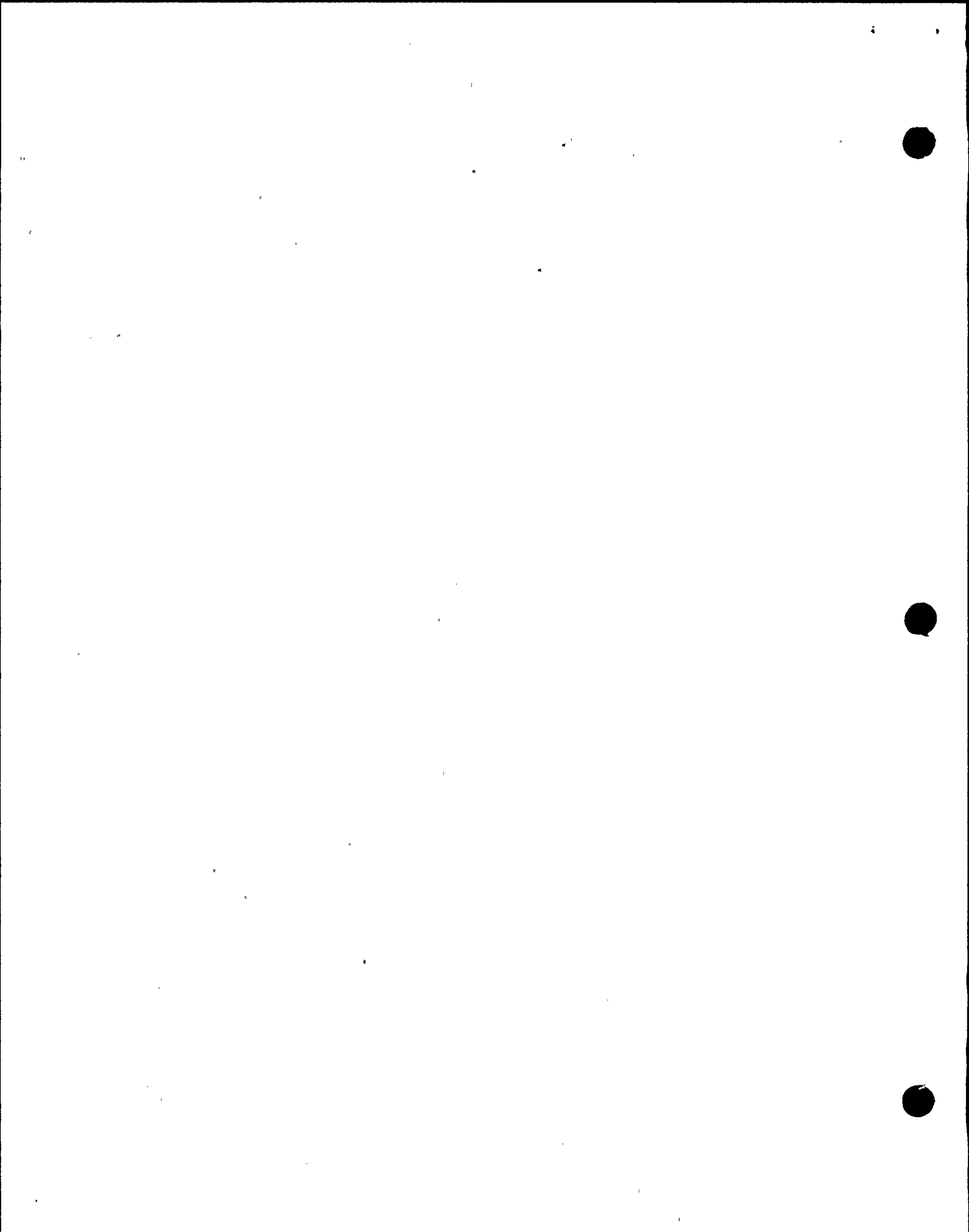
MULTIPLE CHOICE						023	a	b	c	d	___
001	a	b	c	d	___	024	a	b	c	d	___
002	a	b	c	d	___	025	a	b	c	d	___
003	a	b	c	d	___	026	a	b	c	d	___
004	a	b	c	d	___	027	a	b	c	d	___
005	a	b	c	d	___	028	a	b	c	d	___
006	a	b	c	d	___	029	a	b	c	d	___
007	a	b	c	d	___	030	a	b	c	d	___
008	a	b	c	d	___	031	a	b	c	d	___
009	a	b	c	d	___	032	a	b	c	d	___
010	a	b	c	d	___	033	a	b	c	d	___
011	a	b	c	d	___	034	a	b	c	d	___
012	a	b	c	d	___	035	a	b	c	d	___
013	a	b	c	d	___	036	a	b	c	d	___
014	a	b	c	d	___	037	a	b	c	d	___
015	a	b	c	d	___	038	a	b	c	d	___
016	a	b	c	d	___	039	a	b	c	d	___
017	a	b	c	d	___	040	a	b	c	d	___
018	a	b	c	d	___	041	a	b	c	d	___
019	a	b	c	d	___	042	a	b	c	d	___
020	a	b	c	d	___	043	a	b	c	d	___
021	a	b	c	d	___	044	a	b	c	d	___
022	a	b	c	d	___	045	a	b	c	d	___

A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

- | | | | | | | | | | | | |
|-----|---|---|---|---|-----|-----|---|---|---|---|-----|
| 046 | a | b | c | d | ___ | 069 | a | b | c | d | ___ |
| 047 | a | b | c | d | ___ | 070 | a | b | c | d | ___ |
| 048 | a | b | c | d | ___ | 071 | a | b | c | d | ___ |
| 049 | a | b | c | d | ___ | 072 | a | b | c | d | ___ |
| 050 | a | b | c | d | ___ | 073 | a | b | c | d | ___ |
| 051 | a | b | c | d | ___ | 074 | a | b | c | d | ___ |
| 052 | a | b | c | d | ___ | 075 | a | b | c | d | ___ |
| 053 | a | b | c | d | ___ | 076 | a | b | c | d | ___ |
| 054 | a | b | c | d | ___ | 077 | a | b | c | d | ___ |
| 055 | a | b | c | d | ___ | 078 | a | b | c | d | ___ |
| 056 | a | b | c | d | ___ | 079 | a | b | c | d | ___ |
| 057 | a | b | c | d | ___ | 080 | a | b | c | d | ___ |
| 058 | a | b | c | d | ___ | 081 | a | b | c | d | ___ |
| 059 | a | b | c | d | ___ | 082 | a | b | c | d | ___ |
| 060 | a | b | c | d | ___ | 083 | a | b | c | d | ___ |
| 061 | a | b | c | d | ___ | 084 | a | b | c | d | ___ |
| 062 | a | b | c | d | ___ | 085 | a | b | c | d | ___ |
| 063 | a | b | c | d | ___ | 086 | a | b | c | d | ___ |
| 064 | a | b | c | d | ___ | 087 | a | b | c | d | ___ |
| 065 | a | b | c | d | ___ | 088 | a | b | c | d | ___ |
| 066 | a | b | c | d | ___ | 089 | a | b | c | d | ___ |
| 067 | a | b | c | d | ___ | 090 | a | b | c | d | ___ |
| 068 | a | b | c | d | ___ | 091 | a | b | c | d | ___ |



A N S W E R S H E E T

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

- 092 a b c d ____
- 093 a b c d ____
- 094 a b c d ____
- 095 a b c d ____
- 096 a b c d ____
- 097 a b c d ____
- 098 a b c d ____
- 099 a b c d ____
- 100 a b c d ____

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

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 applicant 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 and each answer sheet.
6. Mark your answers on the answer sheet provided. USE ONLY THE PAPER PROVIDED AND DO NOT WRITE ON THE BACK SIDE OF THE PAGE.
7. The point value for each question is indicated in parentheses after the question.
8. If the intent of a question is unclear, ask questions of the examiner only.
9. When turning in your examination, assemble the completed examination with examination questions, examination aids and answer sheets. In addition, turn in all scrap paper.
10. Ensure all information you wish to have evaluated as part of your answer is on your answer sheet. Scrap paper will be disposed of immediately following the examination.
11. To pass the examination, you must achieve a grade of 80% or greater.
12. There is a time limit of four (4) hours for completion of the examination.
13. When you are done and have turned in your examination, leave the examination area (EXAMINER WILL DEFINE THE AREA). If you are found in this area while the examination is still in progress, your license may be denied or revoked.

QUESTION: 001 (1.00)

The following conditions exist:

- | | |
|-------------------------------------|---------------------------|
| - Automatic Depressurization System | - automatically actuated |
| - Reactor water level | - steady at -150 inches |
| - All RHR and CS pumps | - running |
| - 102 second timer | - timed out |
| - 6 ADS valves | - open |
| - Drywell pressure | - 1.5 psig and decreasing |
| - Reactor pressure | - 200 psig |

If timer reset buttons are momentarily depressed, which of the following describes the result on the Automatic Depressurization System?

The SRVs will:

- remain open.
- close and remain closed.
- close and then reopen after 102 seconds.
- close and reopen when the buttons are released.

QUESTION: 002 (1.00)

The following conditions exist:

- All control rods have a charged accumulator.
- One Hydraulic Control Unit has V-102 (scram outlet isolation) closed and V-101 (scram inlet isolation) open.

IDENTIFY the primary effect, if a scram should occur.

- a. Uncontrolled rod drift out will be experienced.
- b. Scram time will decrease to an unacceptable value.
- c. Control rod drive mechanism collet assembly will fail.
- d. Rod motion may be restricted due to bulging of the index tube.

QUESTION: 003 (1.00)

With the APRM Channel meter function switch in the "Count" position, select the MINIMUM reading for an operable APRM.

(Assume the LPRM per level requirements are met.)

- a. 65%
- b. 70%
- c. 75%
- d. 100%

QUESTION: 004 (1.00)

The High Pressure Coolant Injection System automatically initiated due to low RPV level during a station blackout.

Which of the following describes the preferred method of operating HPCI during the blackout?

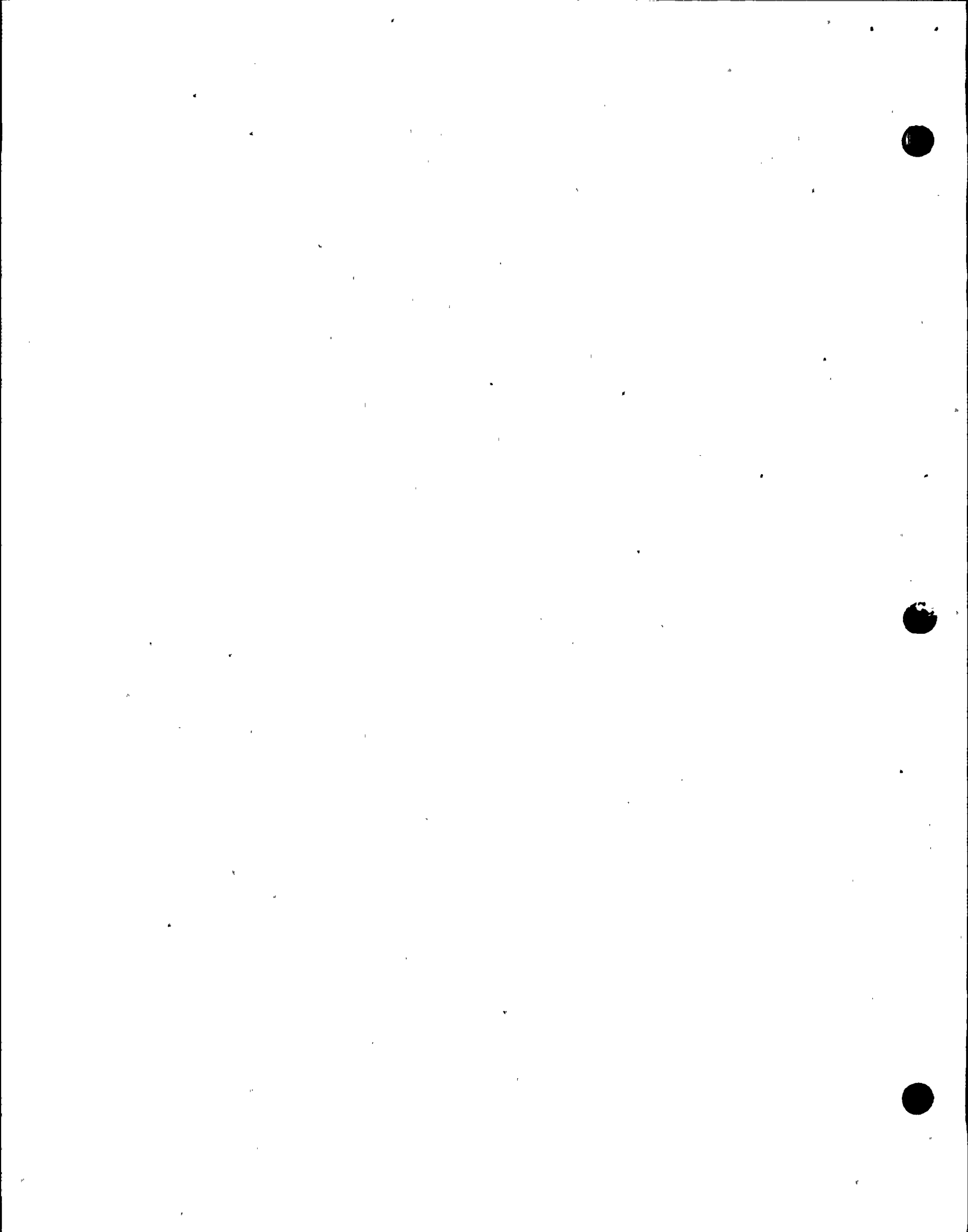
- a. When RPV level is restored between +13 to +54 inches, manually shutdown HPCI.
- b. Manually control HPCI speed as necessary to maintain RPV level between +13 and +54 inches.
- c. Allow HPCI to automatically control level between the high level trip and the low level initiation setpoint.
- d. Alternate between injection mode and CST to CST mode to maintain HPCI in operation.

QUESTION: 005 (1.00)

An ATWS has occurred and the Level/Power Control EOP is being executed. Boron injection is in progress.

Which of the following would allow the SRO to independently make the decision to stop injecting boron?

- a. Injection of hot shutdown weight of boron.
- b. Reactor power level is on the source range with a negative period.
- c. Two control rods are at position 02. All other control rods are fully inserted.
- d. One control rod is at position 04. All other control rods are fully inserted.



QUESTION: 006 (1.00)

Interlocks may be defeated in order to perform which of the following actions in the Emergency Operating Procedure.

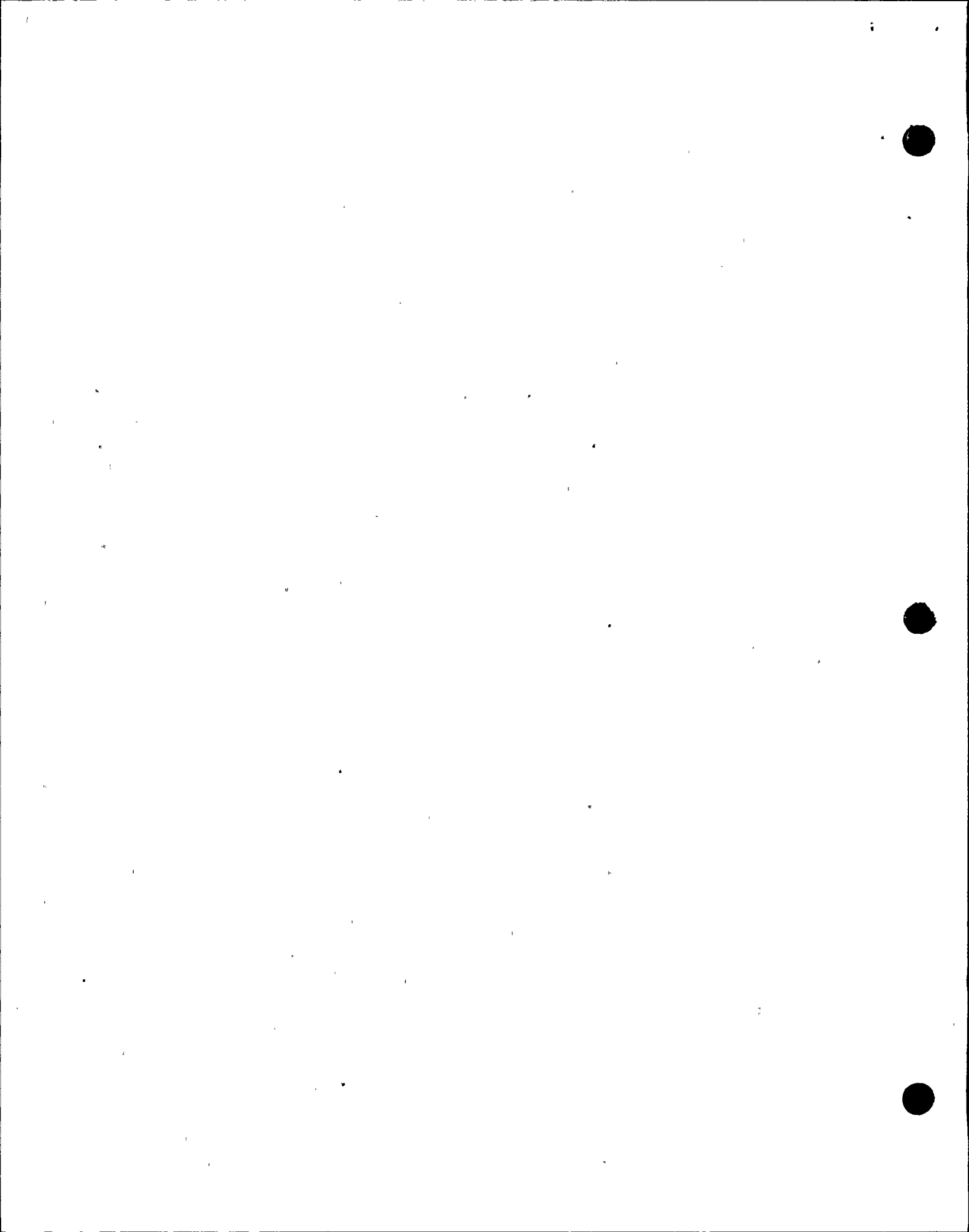
- a. Rapidly depressurize the RPV using bypass valves if Rapid Depressurization is anticipated.
- b. Aligning the suction of HPCI to the CST to augment RPV pressure control.
- c. Aligning the suction of HPCI to the CST for level control.
- d. Opening Main Steam Isolation valves during an ATWS for level control.

QUESTION: 007 (1.00)

A failure of rods to insert on a scram has occurred. Standby Liquid Control was initiated with an initial storage tank level of 4800 gallons. RPV water level is being maintained between -60" and -161" in order to reduce power.

RPV water level restoration may begin when tank level drops to:

- a. 3000 gallons.
- b. 2800 gallons.
- c. 2000 gallons.
- d. 200 gallons.



QUESTION: 008 (1.00)

The following events occurred in the listed order:

- During operation at 92% power all turbine bypass valves failed open.
- At 725 psig the reactor operator manually isolated the Main Steam lines.
- At 675 psig the reactor operator inserted a scram then placed the mode switch to shutdown. All rods inserted.

Select the correct emergency plan classification.

- a. None
- b. Unusual Event
- c. Alert
- d. Site Emergency

QUESTION: 009 (1.00)

An ATWS is in progress and a Main Steam Line Isolation then occurs. RCIC initiated and is maintaining level. SRVs are being opened by the operator to control pressure. Suppression pool water level is decreasing due to a leak in a Core Spray Suction line.

A rapid depressurization is required if suppression pool level drops below 12 feet in order to:

- a. prevent operation at pressure with the RCIC exhaust line uncovered.
- b. prevent operation at pressure with the Drywell-Suppression Pool downcomers uncovered.
- c. allow depressurization to take place prior to uncovering the ECCS suction lines.
- d. allow depressurization to take place prior to uncovering the SRV T-quenchers.

QUESTION: 010 (1.00)

The plant is operating at 100% power when a loss of instrument air occurs.

Which of the following would require a manual reactor scram?

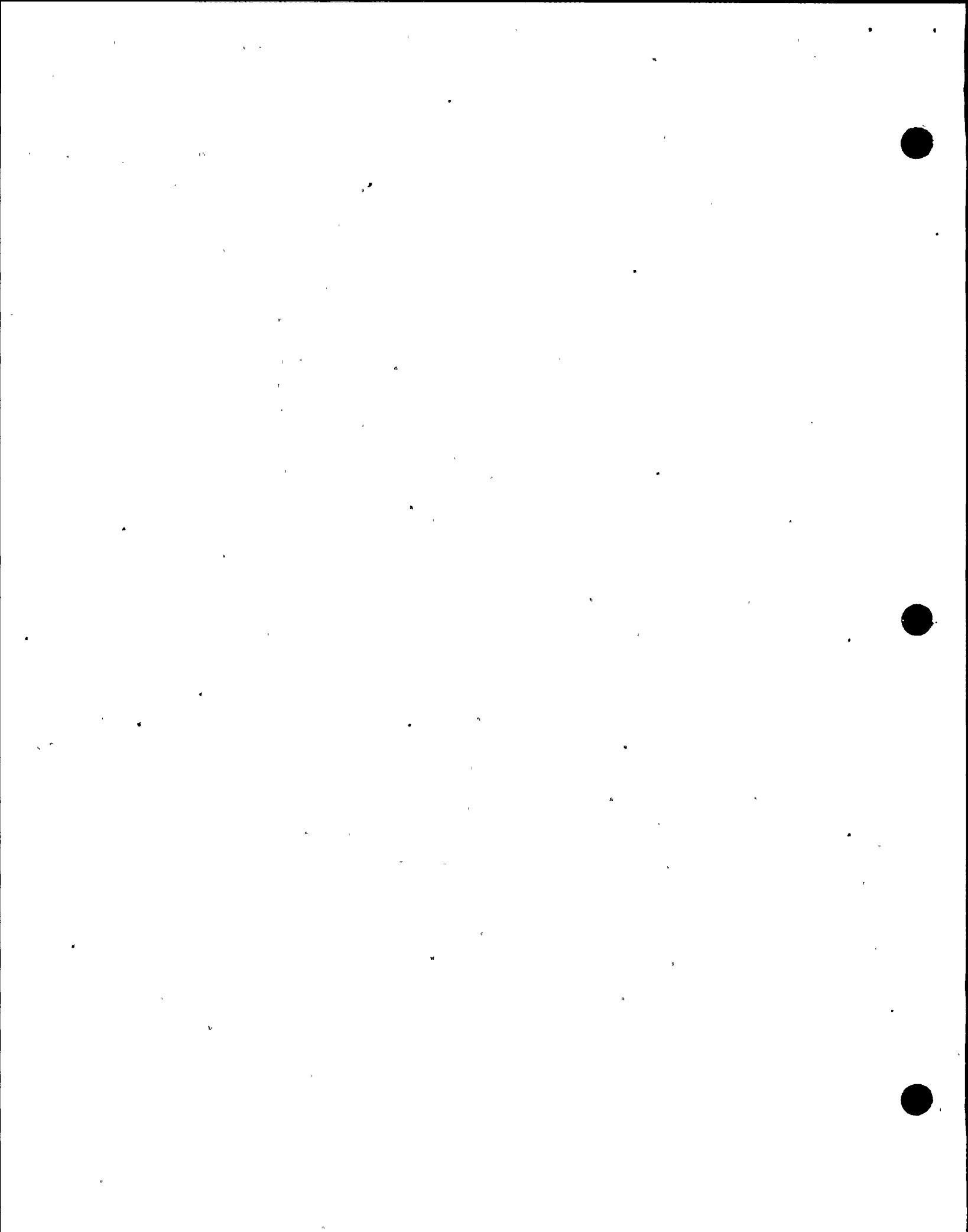
- a. CRD system flow drops below 10 GPM.
- b. Instrument air pressure decreases to 70 psig.
- c. Three rods have drifted from their target position.
- d. A rod block occurs due to scram discharge volume level.

QUESTION: 011 (1.00)

The Reactor Core Isolation Cooling (RCIC) system initiated at -30 inches due to no other injection systems operating. RCIC then raised level to +54 inches.

Identify the response of the RCIC to the high level and subsequent level decrease to -30 inches.

- a. RCIC turbine trips on high level and must be manually reset to allow the turbine to restart at -30 inches.
- b. RCIC Turbine Steam Inlet Valve (F045) will close on high level and the high level seal-in must be manually reset to allow F045 to reopen at -30 inches.
- c. The RCIC turbine governor valve goes shut on high level and the governor valve will automatically reset restarting the turbine at -30 inches.
- d. RCIC Turbine Steam Inlet Valve (F045) will close on high level and will automatically reopen and restart the turbine at -30 inches.



QUESTION: 012 (1.00)

A failure to scram has occurred from 100% power.

Identify why the recirculation pump speed is reduced to minimum prior to tripping the recirculation pumps.

- a. To avoid tripping the turbine due to high RPV water level.
- b. To determine if reducing speed is sufficient to reduce power to less than 5% on the APRMs.
- c. To limit the rapid power reduction transient due to tripping recirculation pumps from high power.
- d. To avoid initiating HPCI and RCIC on low water level.

QUESTION: 013 (1.00)

Given the following plant conditions:

- A failure to scram has occurred.
- Reactor power is 35%.
- Injection has been prevented.
- Reactor water level is -65 inches.

Select the correct actions concerning the Main Steam Isolation Valves.

- a. If the MSIVs are open, bypass all isolation signals.
- b. If the MSIVs are open, bypass only low level isolation signals.
- c. If the MSIVs are closed bypass all signals, then reopen MSIVs.
- d. If the MSIVs are closed bypass all signals except high radiation and high flow, then reopen the MSIVs.

QUESTION: 014 (1.00)

Given the following plant conditions:

- Suppression pool water level is increasing due to a break on the reactor recirculation line.
- The operator has determined that suppression pool level and RPV pressure cannot be maintained below the SRV tail pipe level limit.
- RCIC is aligned to its alternate suction.
- All other injection sources are aligned to their normal suctions.

If adequate core cooling can be assured which of the following systems should be secured?

- a. Core Spray and Condensate
- b. HPCI and Condensate
- c. Low Pressure Coolant Injection and CRD
- d. RCIC and CRD

QUESTION: 015 (1.00)

Core offloading is in progress and a fuel bundle is being raised from the core. Before the grapple actually reaches the normal up position, the "Normal Up" indicating light illuminates and upward motion stops.

Which of the following describes the use of the Hoist Override pushbutton in this situation?

- a. The use of the Hoist Override pushbutton is prohibited when handling irradiated fuel unless specific direction is contained in an OP-ORF procedure.
- b. The Hoist Override pushbutton may be used if a second licensed operator is available to verify actual hoist position.
- c. Only the refuel floor SRO may authorize use of the Hoist Override pushbutton.
- d. The Hoist Override pushbutton is interlocked in a disabled condition when over the core and loaded and thus, cannot be used.

QUESTION: 016 (1.00)

Which of the following will prevent RCIC discharge to the CST through the test line isolation valves F022 and F011?

- a. CST low level and alarm (10,000 gal).
- b. RCIC minimum flow valve is open (F019).
- c. Reactor water level is -55 inches.
- d. The CST suction valve is not full open (F010).

QUESTION: 017 (1.00)

Which of the following will automatically trip the Condenser Mechanical Vacuum Pump?

- a. Condenser suction valve HV-10731 not full open.
- b. Offgas Post Treatment High radiation.
- c. All Main Steam Line RMS INOP.
- d. Mode switch in RUN.

QUESTION: 018 (1.00)

With the Refueling Platform over the core, which of the following, BY ITSELF, will initiate a rod withdraw block for any selected rod?

- a. Grapple not full down.
- b. Mode switch in REFUEL.
- c. Trolley Auxiliary Hoist loaded.
- d. Any single rod not fully inserted.

QUESTION: 019 (1.00)

The following conditions exist:

- RHR shutdown cooling loop A is in operation.
- Reactor water level is 55 inches.

Under these conditions, which of the following has NO protective features or interlocks to prevent draining the reactor vessel?

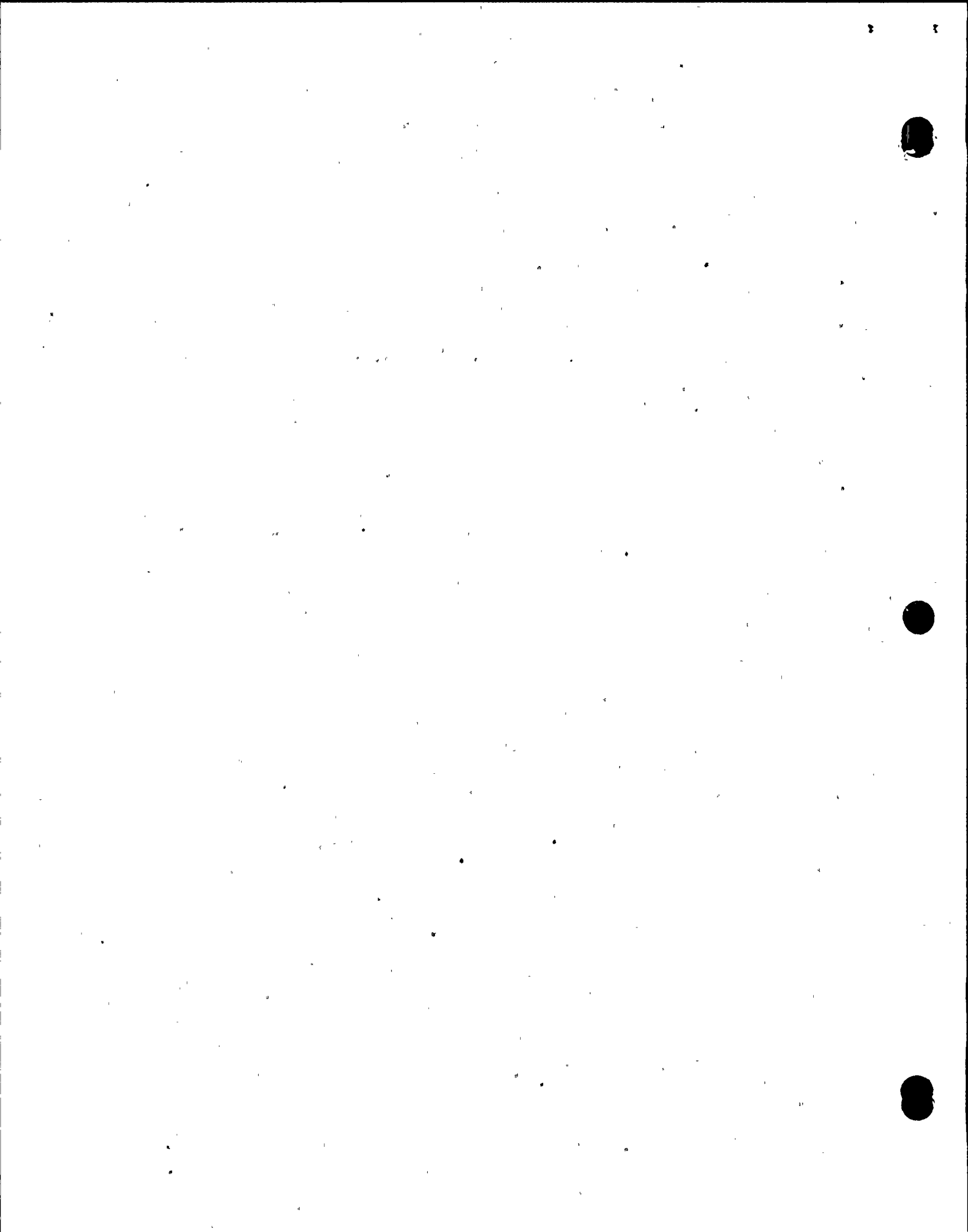
- a. Shutdown Cooling Suction Inboard Valve (F009).
- b. RHR Pump Minimum Flow Valve F007A.
- c. Shutdown Cooling Suction Valve F006A/C.
- d. Injection Isolation Valve F015A.

QUESTION: 020 (1.00)

The scram discharge volume vent and drain valves did not close when a scram occurred.

Which of the following would be the adverse consequence?

- a. The running CRD pump will go into runout and overheat.
- b. There will be a primary leak to secondary containment.
- c. Excess control rod insertion speed will damage the drive mechanism.
- d. Control rod scram times will be longer than normal.



QUESTION: 021 (1.00)

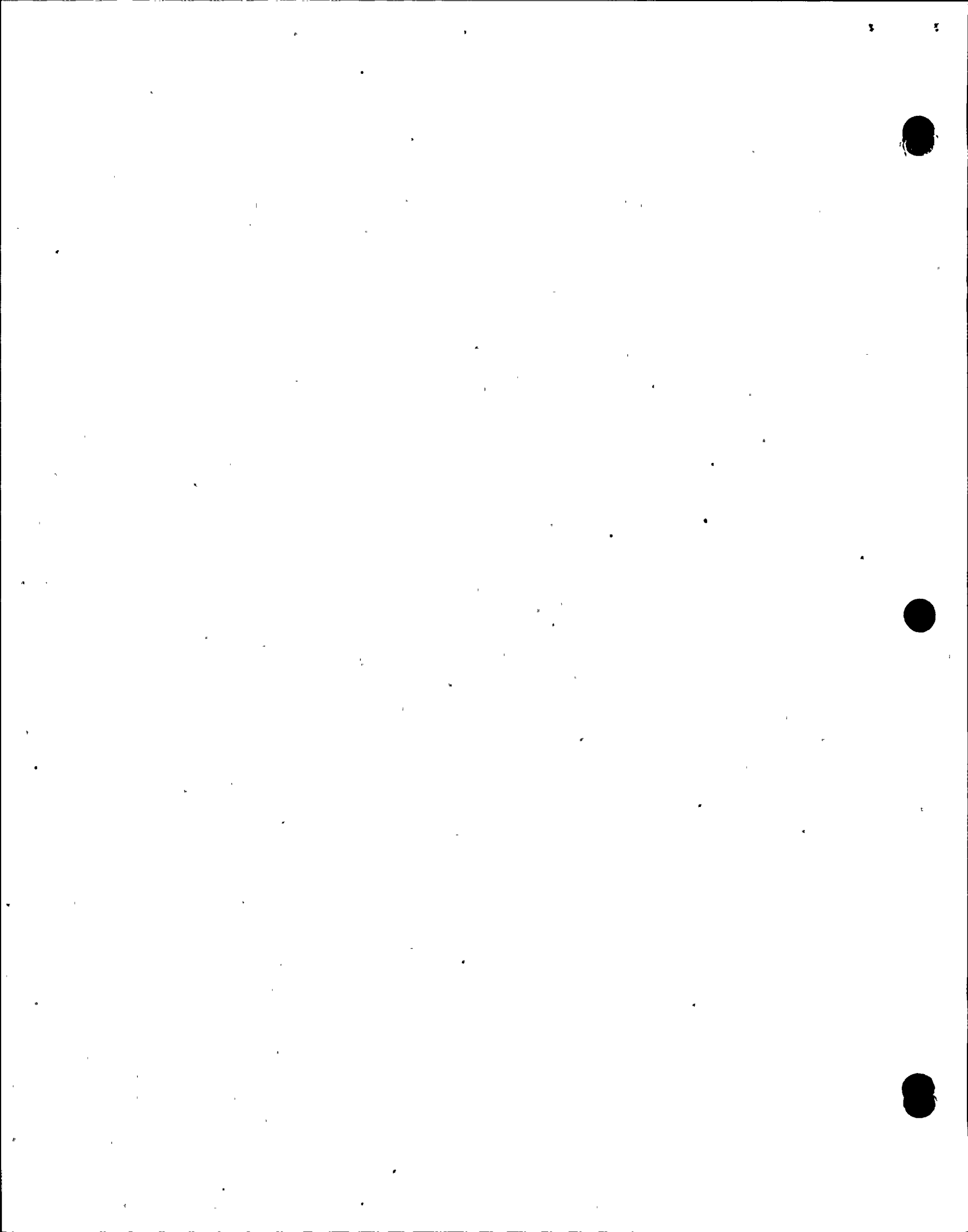
With an initial main condenser vacuum of 28" HgA, and a loss of vacuum in progress, at what decreasing vacuum will the main condenser be lost as a heat sink for decay heat removal using the bypass valves?

- a. 22.9" HgA
- b. 21.7" HgA
- c. 5.1" HgA
- d. 0.0" HgA

QUESTION: 022 (1.00)

An ALERT has been declared, which of the following describes REQUIRED emergency notifications.

- a. State, local agencies, and the NRC must be notified within 15 minutes after declaration of the emergency class not to exceed one hour from start of the event.
- b. The NRC must be notified immediately after state and local agencies are notified, not to exceed one hour after declaration of the emergency class.
- c. State and local agencies must be notified within 15 minutes after declaration of an emergency. The NRC notification may be delayed up to one hour after state and local notifications.
- d. The NRC must be notified within one hour after declaration of an emergency. State and local agencies must be notified immediately thereafter.



QUESTION: 023 (1.00)

Which of the following violates the Maximum Thermal Power (Mwt) level?

Note: Assume the 8 hour average power level is 100%.

- a. Power reaches 3502 Mwt.
- b. Power is 3475 Mwt for 1/2 hour.
- c. Power is 3468 Mwt for 3/4 hour.
- d. Power is 3458 Mwt for one hour.

QUESTION: 024 (1.00)

The following conditions exist:

- While at 100% power, a plant transient has occurred.
- Reactor vessel level was observed to briefly reach 10 inches on all available control room indication.
- Reactor Vessel level is now 28 inches trending to normal.

Select the REQUIRED action?

- a. Immediately initiate an orderly controlled plant shutdown.
- b. No action is required if Reactor Vessel level recovers to normal.
- c. Take manual reactor vessel level control of the feed system.
- d. Immediately initiate a reactor scram.

QUESTION: 025 (1.00)

The Plant Control Operator (PCO) with AT THE CONTROLS responsibility is required to momentarily monitor a back panel.

Which of the following is necessary?

- a. The PCO from the other unit, not assigned AT THE CONTROLS responsibility, must be within view of the control panels.
- b. Any PCO or the Unit Supervisor, assigned to the same unit, must be within view of the control panels.
- c. The Unit Supervisor must temporarily accept AT THE CONTROLS responsibility for that unit.
- d. Another PCO must relieve AT THE CONTROLS responsibility for that unit.

QUESTION: 026 (1.00)

During EOP implementation, which of the following must be performed by referring to the specific procedure for that activity?

- a. Maximizing CRD flow following loss of high pressure feedwater.
- b. Resetting Alternate Rod Insertion (ARI) during an ATWS.
- c. Transferring in-service TBCCW to ESW.
- d. Placing RHR Suppression Pool cooling in service with a LPCI initiation.

QUESTION: 027 (1.00)

It has been discovered that a monthly surveillance test was NOT performed when due and it is now 2 days beyond the VIOLATION date.

Which of the following describes the CURRENT OPERABILITY of this equipment?

- a. Inoperable and action statements of technical specification should be implemented.
- b. Operable until the maximum allowable extension (25%) is reached.
- c. Operable provided that the surveillance test is completed within 24 hours.
- d. Inoperable but action statements of technical specifications can be delayed for 24 hours to allow completion of the surveillance test.

QUESTION: 028 (1.00)

When can a NPO scram control rods using the select rod insert switches?

- a. During an ATWS under direction of a PCO.
- b. Scram time testing in Condition 4.
- c. The control rod is stuck at "02" and should be a "00".
- d. Friction testing in Condition 5.

QUESTION: 029 (1.00)

During "normal" conditions, access to the AT THE CONTROLS area shall be controlled by:

- a. the Shift Supervisor.
- b. the Control Room Coordinator.
- c. a designated senior licensed individual.
- d. the Plant Control Operator or the Unit Supervisor.

QUESTION: 030 (1.00)

Which of the following is the MINIMUM action required when a review of operating logs, one day after a transient, shows that MCPR reached 1.05 during a trip of one recirculation pump?

- a. Place the reactor in Operational Condition 3.
- b. Place the reactor in Operational Condition 4 within 24 hours.
- c. Obtain NRC and Susquehanna Review Committee (SRC) approval to remain at power.
- d. Obtain Operations Management and SRC approval to remain at power.

QUESTION: 031 (1.00)

While at power the MOV Test Switch for the Unit 1 RHRSW Heat Exchanger 'A' Inlet, HV-11210A is in the "Operate" position.

Which of the following applies?

- a. Verify that an active work request exists for the valve.
- b. Place the MOV thermal overload protection in service within 8 hours.
- c. Declare the valve inoperable until the correct switch position is determined.
- d. No action required as this is the normal position of the switch.

QUESTION: 032 (1.00)

Based on operations guidelines, which is NOT an acceptable basis to justify stopping an automatic ECCS actuation?

- a. Directed by the Unit Supervisor while implementing an EOP.
- b. Automatic mis-operation has been confirmed by independent indications.
- c. ECCS equipment damage may result.
- d. Adequate core cooling is assured.

QUESTION: 033 (1.00)

When verifying the position of a locked open manual valve, the operator should:

- a. attempt to move the valve in the open direction as far as the locking device will permit.
- b. move the valve in the closed direction as far as the locking device will permit sufficient to verify valve movement .
- c. remove the locking device, close the valve slightly and restore it to the open position, reinstall the locking device.
- d. remove the locking device and attempt to open the valve. If no movement is felt then reinstall the locking device.

QUESTION: 034 (1.00)

One step of a Unit 1 scheduled surveillance test calls for operating equipment on Unit 2 and is obviously incorrect.

Which of the following is the REQUIRED action for the operator assigned to perform this surveillance?

- a. Have the Unit 1 Supervisor correct the procedure in black pen, initial and date the change.
- b. Place the system in a safe condition, notify Shift Management, and conduct no further steps until a PCAF is approved.
- c. Obtain both the Unit 1 and Unit 2 Supervisor's concurrence and correct the procedure in black pen, initial and date the change.
- d. Obtain the Unit 1 Supervisors concurrence and perform the surveillance by operating the Unit 1 equipment.

QUESTION: 035 (1.00)

During absence of the Shift Supervisor from the control room, while both units are in OPERATIONAL CONDITION 4, which of the following MAY be designated to assume the control room command function in accordance with technical specifications.

- a. Only an individual with a valid Senior Operator license.
- b. An individual with a valid Senior Operator license or Operator license.
- c. Only an individual, excluding the STA, with a valid Senior Operator license.
- d. Only an individual with a valid Senior Operator license who is also qualified as Unit Supervisor.

QUESTION: 036 (1.00)

The shift crew composition may be one person less than the minimum requirements of Technical Specifications (TS) under certain conditions.

Which of the following is a TS violation if you approve decreased shift coverage for that reason?

- a. At two AM, one Plant Control Operator is notified that his spouse was injured in a car accident and he desires to leave.
- b. At shift change one Plant Control Operator is absent due to a car accident while driving to work.
- c. One Unit supervisor has stomach pain and requests to leave immediately.
- d. A Nuclear Plant operator is thought to be intoxicated and you feel he should exit the controlled area.

QUESTION: 037 (1.00)

The following situation exists:

- A licensed individual has just finished drinking one can of beer at home when the Shift Supervisor calls and requests that he/she report for unscheduled overtime in a non-licensed operator position.
- No one else is available.

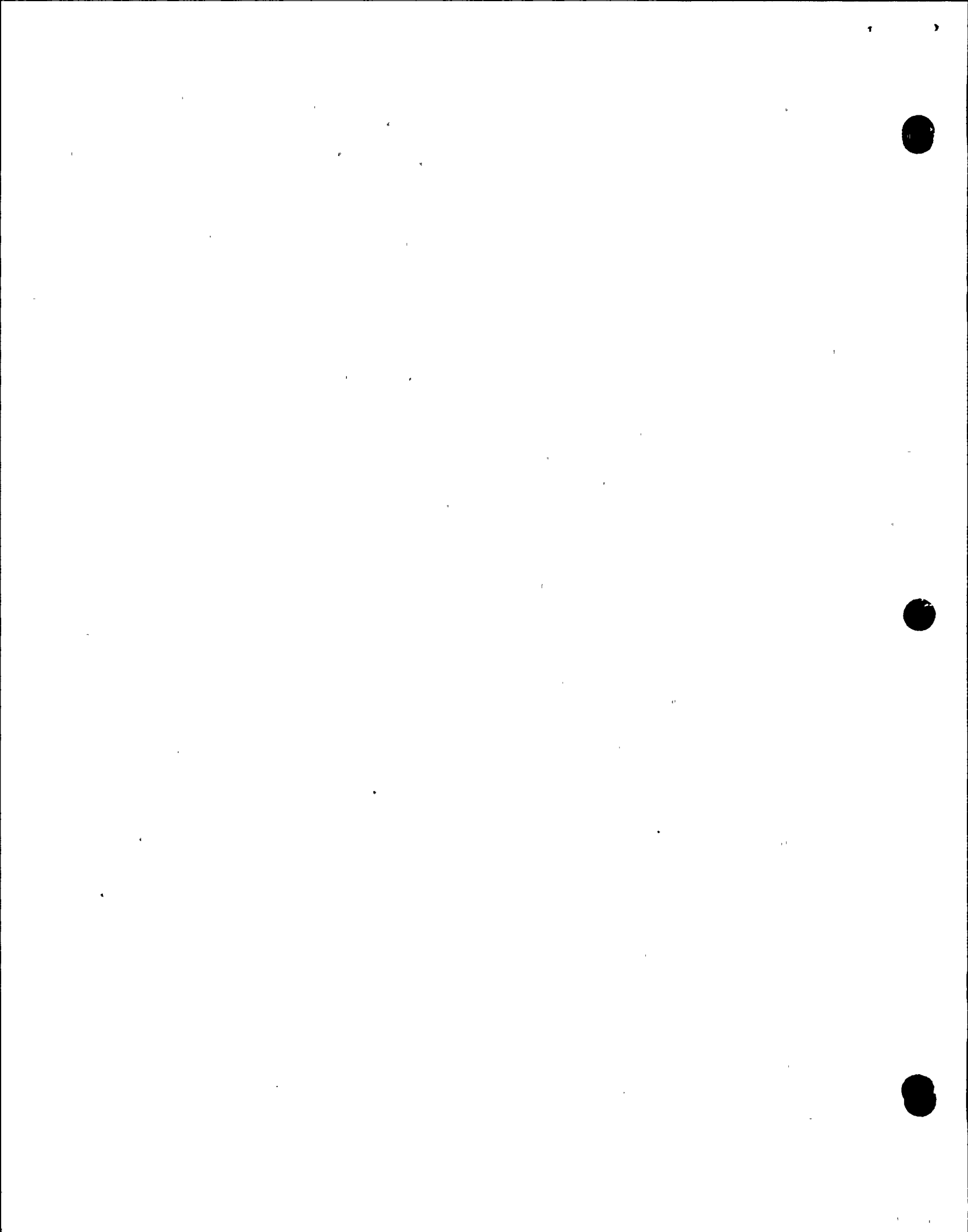
The licensed individual is personally:

- a. required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in but is not required to inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- b. required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in and inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- c. not required to inform the Shift Supervisor that he/she has been drinking alcohol during the call in but is required to inform the Security Shift Supervisor, upon arrival on-site, that he/she had been drinking alcohol.
- d. not required to inform either the Shift Supervisor or the Security Shift Supervisor that he/she had been drinking alcohol.

QUESTION: 038 (1.00)

Which of the following requires that a Limitorque MOV, in a safety related system, be considered inoperable?

- a. Engaging the manual clutch lever.
- b. Cycling open then immediately closing the MOV breaker.
- c. Reinstallation of the control power fuses that were momentarily removed.
- d. Opening the limit switch cover for visual observation during operation of the valve.



QUESTION: 039 (1.00)

Which of the following describes the response of a control rod if the ball check valve in the drive mechanism is stuck closed during a scram?

(Assume normal HCU operation and accumulator pressure.)

The control rod will:

- a. insert until accumulator pressure is less than reactor pressure.
- b. insert until accumulator pressure is less than 400 psig.
- c. fully scram faster than normal.
- d. fully scram slower than normal.

QUESTION: 040 (1.00)

In addition to a ROD OVERTRAVEL annunciator alarm, which of the following is indication of an UNCOUPLED control rod when fully withdrawing a control rod?

- a. Green FULL OUT lights extinguish.
- b. Rod position indication goes blank.
- c. Green FULL OUT lights illuminate.
- d. Green ROD SELECTED light goes out.

QUESTION: 041 (1.00)

Which of the following will bypass ALL rod blocks caused by SRM "A"?

- a. All IRM switches on range 8.
- b. Reactor mode switch in REFUEL.
- c. SRM "A" detector fully withdrawn.
- d. SRM "A" function switch NOT in operate.

QUESTION: 042 (1.00)

Which of the following describes automatic operation of the in service control rod drive Flow Control Valve, immediately after a scram?

The Flow Control Valve will:

- a. open further to maintain flow at the desired setpoint.
- b. remain as is until the scram is reset.
- c. receive a close signal.
- d. receive an open signal.

QUESTION: 043 (1.00)

The following conditions exist:

- A loss of RPS Bus "A" has occurred
- Restoration of power to RPS Bus "A" is complete.
- ONE of the four white scram lights for RPS Bus "A" will not reenergize.
- The light bulb is not burned out.
- All RPS "B" white scram lights are energized.
- The Backup/Group Pilot Scram System Power Failure alarm for RPS "A" has alarmed.

Which of the following describes the current status of the control rods?

- a. 1/4 of control rod scram solenoids fed by RPS "A" are receiving alternate power.
- b. 1/4 of control rod scram solenoids fed by RPS "A" should have scrammed.
- c. 1/4 of all control rods should have scrammed.
- d. 1/4 of all control rods have received a 1/2 scram.

QUESTION: 044 (1.00)

With the reactor initially at 100% power, which of the following would be an indication of an open Safety Relief Valve?

- a. Feedwater temperature decrease.
- b. Total indicated steam flow increase.
- c. Generator power (MWE) increase.
- d. Reactor power decrease.

QUESTION: 045 (1.00)

A Traversing In-Core Probe (TIP) trace is in progress during which a NSSS isolation on high drywell pressure occurs.

What is the expected AUTOMATIC response of the TIP system?

- a. The TIP Probe will withdraw to the shield chamber followed by ball valve closure.
- b. The TIP Probe will withdraw to the shield chamber followed by the shear valve closure.
- c. The TIP Probe will withdraw to the drive mechanism followed by shear valve closure.
- d. The TIP ball valve and shear valve will close, if the detector is in the guide tube.

QUESTION: 046 (1.00)

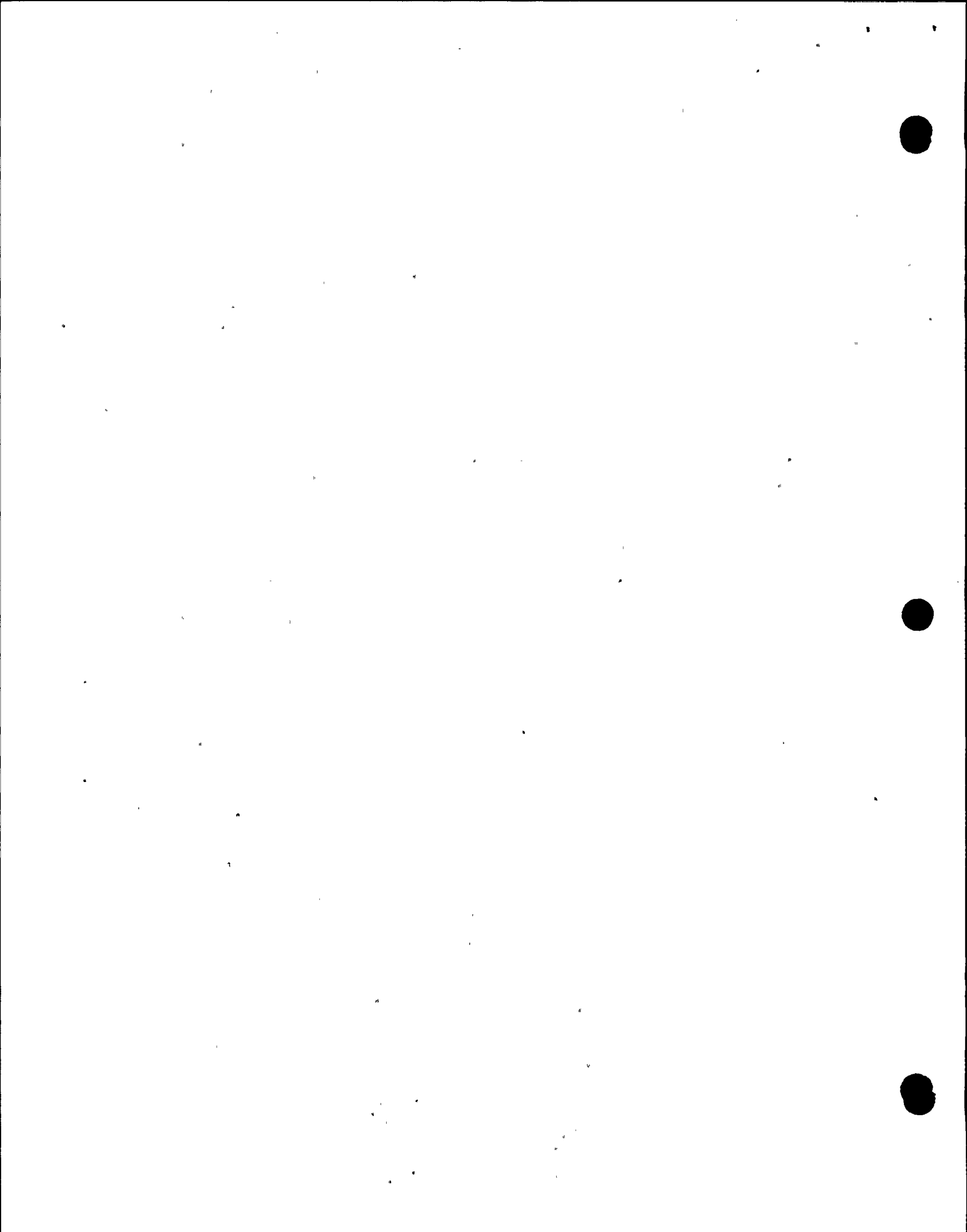
With the keylock in NORMAL, a loss of rod position signal from the selected rod to the Rod Worth Minimizer will cause:

- a. only a "SYSTEM ERROR" display.
- b. only a withdraw block if power is less than the Low Power Set Point.
- c. a withdraw and insert rod block if power is less than the Low Power Set Point.
- d. a withdraw and insert rod block at any power.

QUESTION: 047 (1.00)

Select the Reactor Protection System scram input that is required to be operable in ALL Operational Conditions.

- a. APRM Inoperative.
- b. Mode switch in SHUTDOWN.
- c. Main steam line pressure low.
- d. Scram Discharge Volume Water Level High.



QUESTION: 048 (1.00)

With both recirculation pumps speeds matched at 100% power, which of the following is indication of a reactor recirculation jet pump failure (loss of the nozzle)?

Indicated recirculation loop flow in the loop with the failed jet pump will:

- a. decrease and the failed jet pump D/P indication will be more noisy than others.
- b. decrease and main generator output will decrease.
- c. increase and indicated total core flow will increase.
- d. increase and core thermal power will increase.

QUESTION: 049 (1.00)

The following conditions exist:

- A reactor startup is in progress.
- The mode switch is in STARTUP.
- The main turbine is tripped.
- A valid MSIV isolation has occurred.
- The reactor did not scram (No ATWS condition exists).

Which of the following was the only signal that could have generated the MSIV isolation?

- a. Reactor vessel water level low.
- b. Main steam line pressure low.
- c. Main steam line radiation high.
- d. Main steam line flow high.

QUESTION: 050 (1.00)

Which of the following are DC powered and must energize to operate in order to perform the intended function during a scram?

- a. Scram dump valves (F009 and F182).
- b. Backup Scram valves (110A and 110B).
- c. Scram pilot valve solenoids (117 and 118).
- d. SDV vent and drain valves (F010, 011, 180, 181).

QUESTION: 051 (1.00)

While at 100% power, which of the following describes the effect on the Alternate Rod Insertion (ARI) system of manually actuating ONLY one ARI division?

The ARI system will:

- a. reposition one ARI valve in each vent and supply path.
- b. not reposition any valves unless the other division is also actuated.
- c. vent the air header but not isolate the air supply path.
- d. initiate to cause a reactor scram.

QUESTION: 052 (1.00)

Which of the following will NOT reposition any of its automatic isolation valves until both divisions of their control logic have lost power?

- a. Reactor Core Isolation Cooling valves.
- b. Residual Heat Removal valves.
- c. Main Steam Isolation valves.
- d. Reactor Water Cleanup valves.

QUESTION: 053 (1.00)

An ATWS has occurred and the following conditions exist:

- | | |
|-----------------------------|------------------------------|
| - Reactor power | - 20% on APRMs |
| - Reactor water level | - 30 inches |
| - Drywell pressure | - 1.1 psig |
| - All scram valves | - open |
| - SDV vent and drain valves | - closed |
| - Mode switch | - in SHUTDOWN |
| - SDV water level | - high level scram signal in |

Which of the following describes resetting of the scram to allow draining of the Scram Discharge Volume (SDV) under these conditions?

- The scram can be reset by placing the mode switch in STARTUP and the SDV high water level bypass keylock switch in BYPASS.
- The scram can be reset 10 seconds after the mode switch is placed in SHUTDOWN.
- The scram can be reset by placing the Scram Discharge Volume Bypass switch in BYPASS.
- The scram cannot be reset unless RPS trips are bypassed IAW ES-158-002, when directed by EO-100-113, "Control Rod Insertion".

QUESTION: 054 (1.00)

At the Remote Shutdown Panel (C201), all the Safety Relief Valve (SRV) Control Transfer Switches located on that panel have been placed in "EMERGENCY".

How does this affect the SRV operation if a valid ADS signal is subsequently generated?

- Only three SRVs will open.
- Only the transferred SRVs will open.
- None of the SRVs will open.
- Six SRVs will open.

QUESTION: 055 (1.00)

The following conditions exist:

- The mode switch is in RUN.
- IRM "A" becomes INOP due to High Voltage low.
- IRM "A" is NOT in BYPASS.

Which of the following will subsequently cause a trip of RPS "A"?

- a. Placing IRM "A" in BYPASS.
- b. An IRM "A" downscale signal.
- c. Placing the mode switch in STARTUP.
- d. Placing IRM "A" in BYPASS with APRM channel "A" in BYPASS.

QUESTION: 056 (1.00)

The following conditions exist:

- The plant is in Operational Condition 4.
- Reactor vessel flange and head flange temperatures are slowly increasing.

In order to tension the reactor vessel head bolting studs, the temperature must be verified greater than or equal to:

- a. 70 degrees F each 30 minutes during tensioning until greater than 100 degrees F.
- b. 70 degrees F within 30 minutes prior to tensioning.
- c. 80 degrees F but less than 100 degrees F each 30 minutes during tensioning.
- d. 80 degrees F and less than 100 degrees F within 30 minutes prior to tensioning.

QUESTION: 057 (1.00)

The following conditions exist while at power:

- The High Pressure Coolant Injection (HPCI) system was started up component by component.
- A Nuclear Plant Operator reports that there is a steam leak on the HPCI turbine.
- The Unit Supervisor directs the Plant Control Operator to manually isolate HPCI.

Which of the following would be the expected result if the PCO depresses the "Manual Isolation" pushbutton?

- a. The HPCI system will continue to operate.
- b. A full HPCI system isolation and turbine trip occurs.
- c. Only the Steam Supply valve F001 and Turbine Stop valve HV-15012 will close.
- d. Steam Supply Outboard Isolation valve F003 will close and the HPCI turbine trips.

QUESTION: 058 (1.00)

Which of the following RCIC mechanical and electrical overspeed and HPCI mechanical overspeed trips require local manual reset at the turbine?

- a. Only RCIC mechanical overspeed trip.
- b. RCIC mechanical and electrical overspeed and HPCI mechanical overspeed trips.
- c. RCIC mechanical and electrical overspeed trips.
- d. Only HPCI mechanical overspeed trip.

QUESTION: 059 (1.00)

The following conditions exist during a Station Blackout (no incoming or diesel AC power):

- The Reactor Core Isolation Cooling (RCIC) system was started in response to a valid initiation signal.
- A valid RCIC isolation signal is subsequently generated.

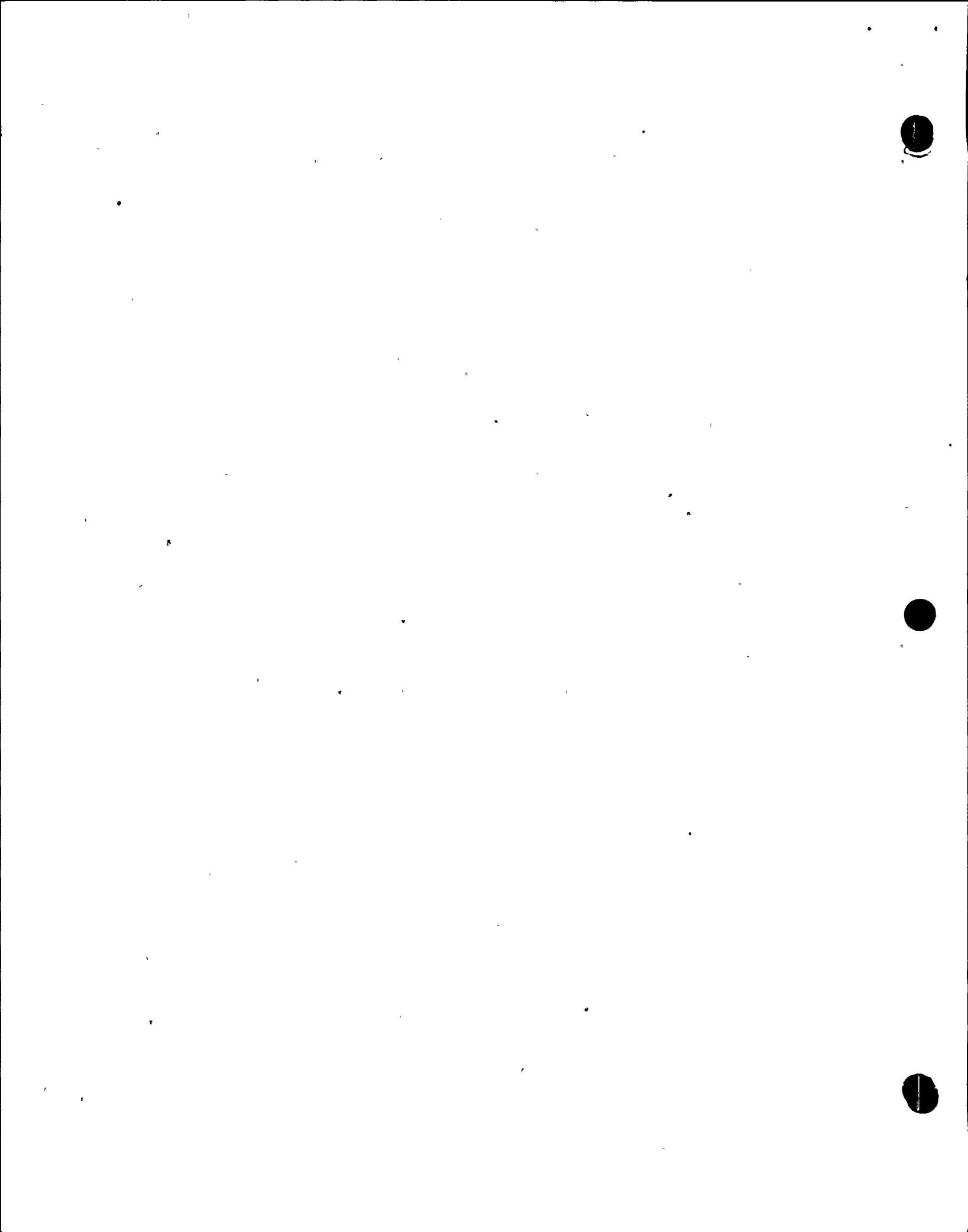
Which of the following would be the expected result?

- a. The RCIC system will continue to operate.
- b. A full RCIC system isolation and turbine trip occurs.
- c. The Steam Supply Inboard Isolation valve F007 will close and turbine trip occurs.
- d. The Steam Supply Outboard Isolation valve F008 will close and turbine trip occurs.

QUESTION: 060 (1.00)

IDENTIFY the Process Radiation Monitor System (PRM) that WILL cause an isolation when excess radioactivity is detected, but does NOT prevent a radioactive release.

- a. Railroad Shaft Access Exhaust PRM
- b. Control Room Emergency Air PRM.
- c. Refuel Floor Wall Exhaust PRM.
- d. RHR Service Water PRM.



QUESTION: 061 (1.00)

The following conditions exist:

- The reactor is in Operational Condition 5 with all fuel loaded.
- All control rods are at position 00.
- One Control Rod Drive (CRD) mechanism is to be removed.
- Both trains of the Standby Gas Treatment System (SGTS) are inoperable.

Which of the following applies?

The CRD mechanism removal:

- a. must be delayed until at least one train of SGTS is operable.
- b. can proceed but must be completed within 7 days.
- c. can proceed but without control rod removal.
- d. can NOT be performed.

QUESTION: 062 (1.00)

The following conditions exist:

- The reactor has scrammed.
- Level Setpoint Setdown has actuated.
- Reactor water level has stabilized at +18 inches.
- No operator actions have been taken regarding the feedwater level control system.
- The operator then depresses the "SETPOINT SETDOWN" reset button for five seconds and then releases it.

What is the expected plant response?

- a. The Level Setdown will clear and level will stabilize at +18 inches.
- b. The Level Setdown will not clear and level will remain at +18 inches throughout the evolution.
- c. The Level Setdown will clear and Reactor Feed Pump speed will increase to raise reactor water level to +35 inches.
- d. The Level Setdown will not clear and level will stabilize at +18 inches, but while the button is depressed Reactor Feed Pump speed will increase to attempt to raise level to +35 inches.

QUESTION: 063 (1.00)

The following conditions exist:

- Both plants are operating at power.
- The Standby Gas Treatment System (SGTS) is in the standby lineup.
- A valid SGTS system initiation signal is received from Unit 2 high drywell pressure.

SELECT the location from which the SGTS will automatically take suction.

- a. Unit 2 Drywell and Suppression Chamber.
- b. Both units Drywell and Suppression Chambers.
- c. Reactor Building Recirculation Supply Plenum.
- d. Unit 2 Drywell and Unit 2 HPCI Barometric Condenser.

QUESTION: 064 (1.00)

The following conditions exist:

- Reactor power - 100% and steady
- Reactor water level - 30 inches
- Reactor pressure - 1030 psig
- Mode switch - in RUN
- APRMs/IRMs/SRMs bypassed - None

Both divisions of the 24 VDC power system (D670 and D680) become deenergized.

In accordance with Technical Specifications, which of the following applies to reactor power operation?

- a. Continued operation at power is permissible indefinitely.
- b. Be in STARTUP within 6 hours and HOT SHUTDOWN within the next 6 hours.
- c. Make operable at least 3 SRMs within 4 hours or be in HOT SHUTDOWN in at least 12 hours.
- d. Intentional entry into the Intermediate or Source Range is prohibited.

QUESTION: 065 (1.00)

While at power, if both seals on one reactor recirculation pump experience gross failure, the MAXIMUM increase in leak rate to the containment (equipment sump) could reach approximately:

- a. 0.75 gpm.
- b. 2.0 gpm.
- c. 20 gpm.
- d. 40 gpm.

QUESTION: 066 (1.00)

Which of the following describes the effect on Reactor Recirculation Pump operation when the Alternate Rod Insertion (ARI) system is manually initiated instead of automatically initiated?

- a. The recirculation pumps trip immediately.
- b. The recirculation pumps do not automatically trip.
- c. Only the generator field breakers receive a direct trip.
- d. The recirculation pumps trip after a 15 second time delay.

QUESTION: 067 (1.00)

Select the set of conditions for which ALL reactor water level indicators should be considered invalid.

INSTRUMENT RUN/DRYWELL TEMPERATURE - RPV PRESSURE

- a. 200 degrees F, 30 psig
- b. 325 degrees F, 90 psig
- c. 350 degrees F, 100 psig
- d. 400 degrees F, 250 psig

QUESTION: 068 (1.00)

A Safety Relief Valve (SRV) tailpiece vacuum breaker has failed in the open position during SRV operation.

Which of the following will result?

- a. Steam bypassing the quenchers with a direct discharge path into the suppression pool water.
- b. Direct pressurization of the drywell air space each time the SRV is opened.
- c. Suppression pool water being drawn up into the SRV tailpiece line after the SRV is closed.
- d. Incorrect relief mode setpoints for this SRV due to reduced back pressure.

QUESTION: 069 (1.00)

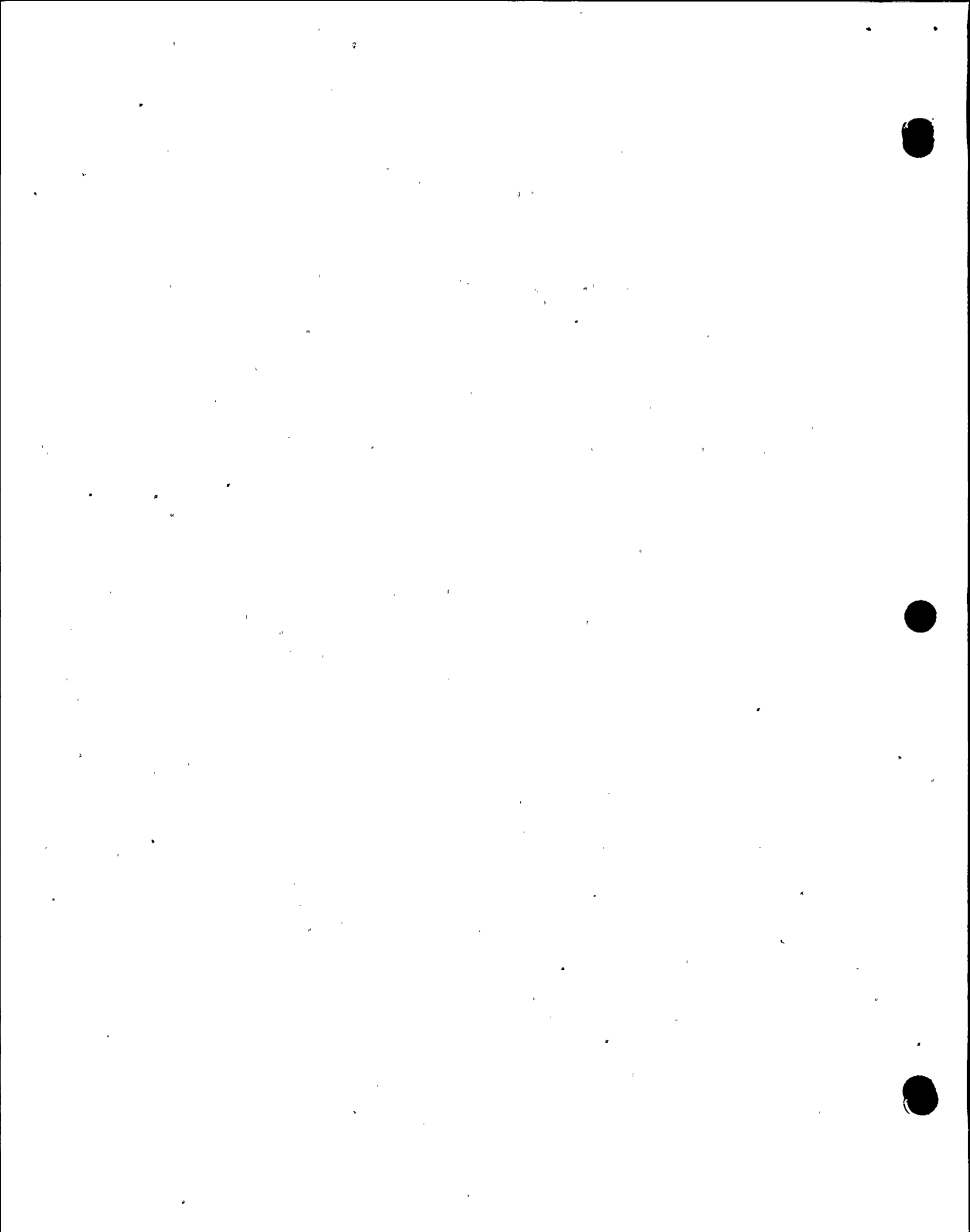
Given the following conditions:

- Plant is at power with reactor pressure at 1000 psig
- Suppression pool temperature is 82 degrees F
- At 0800 one SRV spuriously opens

After attempting to close the SRV by taking its control switch to OFF, a check of SRV tailpipe temperature indicates approximately 295 degrees F and stable.

Under these conditions the reactor is allowed to stay at power:

- a. until 0802.
- b. indefinitely.
- c. until suppression pool temperature reaches 110 degrees F.
- d. indefinitely if the safety function of 12 other SRVs are operable.



QUESTION: 070 (1.00)

The plant is operating at 90% power when the following events occur in the order given:

- FW LOOP B PANEL 1C102 TROUBLE alarm
- APRM UPSCALE alarm
- ROD OUT BLOCK alarm
- Feedwater temperature is observed on a downward trend.

Recirculation flow is required to be reduced until:

- a. core flow reaches 55 MLBS/hour without regard to reactor power level.
- b. reactor power decreases by 20% OR the restricted region of the Power/Flow map is reached.
- c. core flow reaches 55 MLBS/hour OR reactor power decreases by 20%.
- d. reactor power decreases by 20% without regard to core flow decrease.

QUESTION: 071 (1.00)

The plant is in Condition 4 with Primary and Secondary Containment established when a loss of shutdown cooling occurs. It is desired to use non-ADS SRVs to maintain reactor pressure and cool the core.

In order to use the SRVs in this manner, reactor pressure must be at least 19 psig because:

- a. the SRVs will not open below 19 psig.
- b. the heat transfer rate below 19 psig will be insufficient to adequately cool the core under worst case power history.
- c. below 19 psig the differential pressure will be insufficient to clear the column of water from the SRV downcomers.
- d. below 19 psig flow through the SRV will be insufficient to determine valve position by acoustic monitor.

QUESTION: 072 (1.00)

Unit 1 has experienced an unplanned reduction in Recirculation System flow and is in Region II of the Power/Flow Map.

(Unit 1 Power/Flow Map is provided.)

An immediate scram is required if:

- a. any APRM HI alarm comes in and clears on a 1-10 second period.
- b. any LPRM upscale alarm comes in and clears on a 1-10 second period.
- c. APRM peak to peak oscillations trend toward 5%.
- d. LPRM peak to peak oscillations trend toward 10 watts/cm².

QUESTION: 073 (1.00)

A Control Room evacuation is required. All immediate actions were performed prior to evacuation. While you are enroute to the Remote Shutdown Panel, excessive reactor pressure will initially be prevented:

- a. by turbine bypass valves.
- b. by HPCI which was left running in the pressure control mode.
- c. by SRVs in the relief mode.
- d. by SRVs in the safety mode.

QUESTION: 074 (1.00)

With the plant at 20% power, condenser vacuum is gradually being lost and is currently 21 inches Hg Vacuum.

Which of the following automatic actions should have occurred at this point?

- a. Reactor Scram and Main Turbine Trip.
- b. Main Turbine Trip, Reactor Scram and Reactor Feed Pump Turbine Trip.
- c. Main Turbine Trip only.
- d. Reactor Scram only.

QUESTION: 075 (1.00)

Given the following plant conditions:

- Unit 2 was operating at 100% power for the previous 100 days.
- At 0800 an ATWS occurs with no rod motion.
- RPV Level is lowered to -95 inches and RPV pressure is 1050 psig. These values will remain constant.
- At 0900 1800 gallons of boron have been injected and completely mixed. No additional boron is injected.

Which of the following describes the reactor criticality at 0900 and at 1700.

- a. The reactor should be shutdown at 0900 and be more subcritical at 1700.
- b. The reactor should be shutdown at 0900, but should have returned to criticality before 1700.
- c. The reactor should NOT be shutdown at 0900, but will be shutdown before 1700.
- d. The reactor should NOT be shutdown at 0900 and will be at a higher power level at 1700.

QUESTION: 076 (1.00)

During an ATWS RPV level is being controlled between -60 inches and -161 inches with a target band of -80 inches to -110 inches.

Which of the following describes the consequences of operating outside the target band?

If RPV level was allowed to go:

- a. above -80 inches core power would be more responsive to RPV pressure fluctuations.
- b. above -80 inches level control would become more difficult.
- c. below -110 inches adequate core flow to carry liquid poison into the core could be lost.
- d. below -110 inches Wide Range level indication must be assumed lost.

QUESTION: 077 (1.00)

The preferred method to determine control rod positions following a reactor scram is by:

- a. observing full core display.
- b. observing RSCS core display.
- c. demanding an new OD-7 scan.
- d. verifying no withdraw error exists on the Rod Worth Minimizer.

QUESTION: 078 (1.00)

During a LOCA level falls below -145 inches on the Wide Range Level instrument. The Wide Range Level instrument is determined UNUSABLE per ON-145-004, RPV Water Level Anomaly. The Fuel Zone Level indicator is then used as the primary level indicator.

The Fuel Zone Level indicator should be used as the primary indicator until level is restored to:

- a. -145 inches.
- b. -130 inches.
- c. -125 inches.
- d. -110 inches.

QUESTION: 079 (1.00)

Given the following conditions:

- A small LOCA has occurred.
- Reactor pressure is 950 psig and slowly decreasing. No SRVs are currently open.
- Reactor water level is -150 inches and slowly decreasing.
- LPCI Loop A is the only system available for injection.
- Maintenance has checked the status of all other injection sources and has reported that no system can be returned within 8 hours.

Which of the following describes the required action?

- a. Stop at step RC/L-19 of RPV Control until level drops to -161 inches. Then go to Rapid Depressurization.
- b. Open all Bypass Valves until a cooldown of 100 degrees has been achieved. Then wait for level to reach -161 inches and perform Rapid Depressurization.
- c. Open all Bypass Valves. Ignore cooldown rate limits. At -161 inches close bypass valves and perform Rapid Depressurization.
- d. Open all Bypass Valves. Ignore cooldown rate limits. At -161 inches leave bypass valves open and perform Rapid Depressurization.

QUESTION: 080 (1.00)

Given the following plant conditions:

- The plant is at 100% power
- An unisolable RWCU system leak occurs in the RWCU Pump Room.
- A Class A fire is then discovered on the 779 elevation of the Reactor Building. Area temperature is reported to be 175 degrees F. Water is being used to combat the fire.

Select the required action:

- a. Isolate the water suppression discharging into secondary containment, enter RPV control prior to exceeding 212 degrees F in the RWCU pump room.
- b. Continue fighting the fire with water suppression, wait until RWCU pump room exceeds 212 degrees F, then commence reactor shutdown.
- c. Continue fighting the fire with water suppression, when temperature exceeds 212 degrees F in RWCU pump room, enter RPV control, then transition immediately to RPV flooding
- d. Continue fighting the fire with water suppression, before temperature exceeds 212 degrees F in RWCU pump room, enter RPV control. When RWCU pump room temperature exceeds 212 degrees F, enter Rapid Depressurization.

QUESTION: 081 (1.00)

Given the following plant conditions:

- The plant is at 100% power.
- The HPCI Equipment Area High Level Alarm has just been reached.
- HPCI Equipment Area Water Level is increasing.

Prior to the HPCI Equipment Area Level reaching the Max Safe Value, entry to RPV Control is required if a system:

- a. containing radioactive water is discharging into Secondary Containment.
- b. without automatic isolation capability is discharging into Secondary Containment.
- c. with a leak rate greater than sump pump capability is discharging into Secondary Containment.
- d. with a leak rate that is dependent on RPV pressure is discharging into Secondary Containment.

QUESTION: 082 (1.00)

Given the following conditions:

- Plant startup is in progress.
- Main generator has been synchronized to the grid and loaded to 100 Mwe.
- The EXCITER FIELD BKR TRIP alarm comes up on panel 1C651.
- Generator load drops to Zero.
- A check of main turbine speed shows that it is remaining constant.
- The main trubine was manually tripped.

Select the required action.

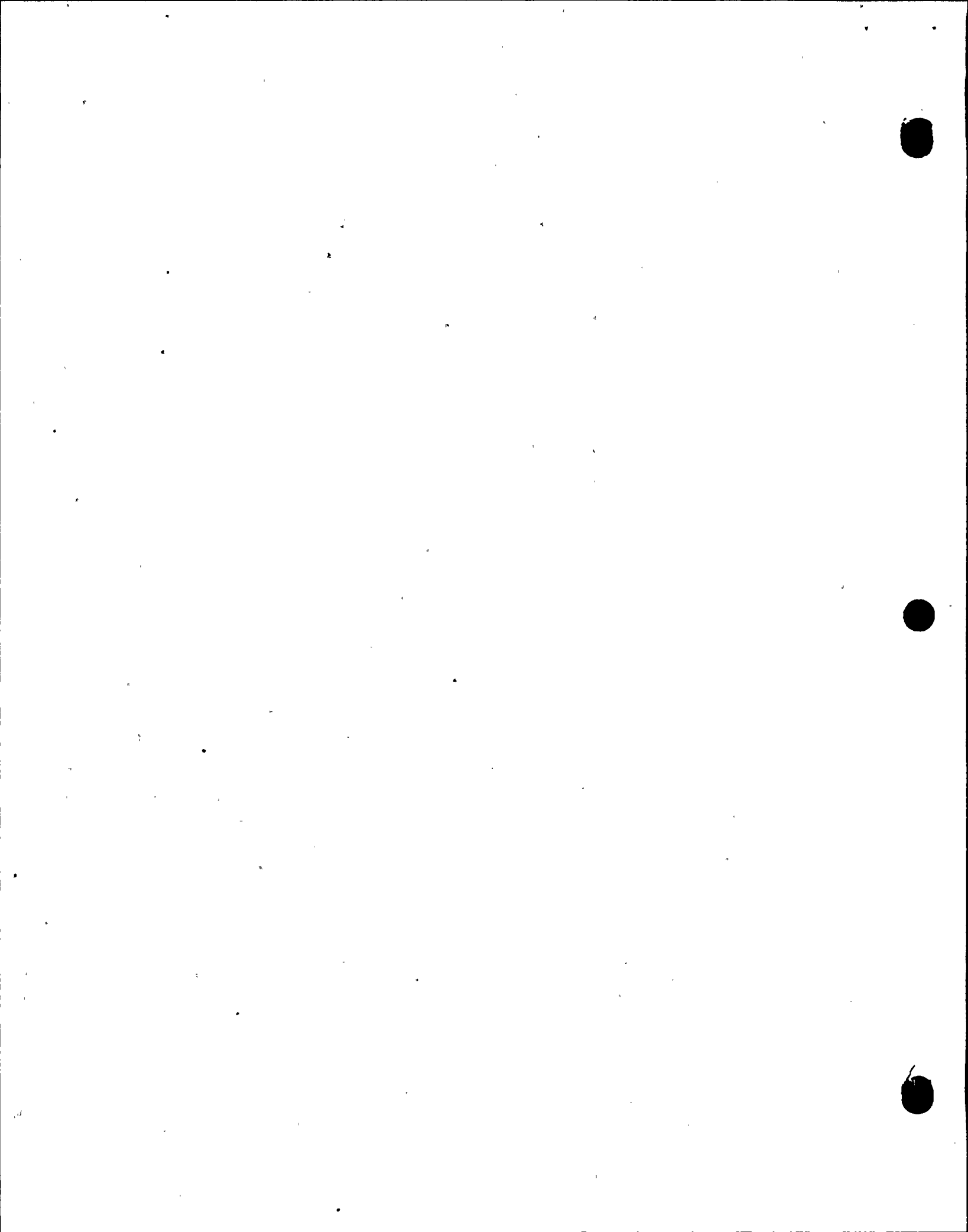
- a. Start turning gear oil pump (TGOP) and motor suction oil pump (MSOP).
- b. Close all MSIVs.
- c. Open bypass valves as necessary to lower pressure and close turbine control valves.
- d. Break Main Condenser vacuum using the Condenser Vacuum breakers.

QUESTION: 083 (1.00)

With an increasing primary containment pressure, emergency operating procedures require the initiation of suppression chamber sprays.

In order to initiate suppression chamber sprays, suppression pool level must be less than 49 feet in order to prevent:

- a. submergence of the vacuum breaker valves.
- b. exceeding the SRV Tail Pipe Level limit.
- c. submergence of the suppression chamber spray nozzles.
- d. exceeding the Primary Containment Pressure limit.



QUESTION: 084 (1.00)

Given the following conditions:

- The plant is operating at 100% power when a small break LOCA occurs and results in a reactor scram.
- HPCI system is being used to control level between +13 and +54 inches.
- Drywell and Suppression Chamber pressures have risen rapidly and stabilized at approximately 24.5 psig.
- Average drywell temperature is 300 degrees F.

Drywell sprays must:

- a. be secured if currently in use to prevent exceeding the drywell-suppression chamber differential pressure limits.
- b. be placed in service immediately and be secured if drywell temperature reaches 350 degrees F to prevent dropping below the drywell high pressure scram setpoint.
- c. NOT be placed in service if not currently in use to prevent dropping below the drywell high pressure scram setpoint. If in use, drywell sprays may remain in use.
- d. NOT be placed in service if not currently in use to prevent exceeding the drywell suppression chamber differential pressure limits. If in use, drywell sprays may remain in use.

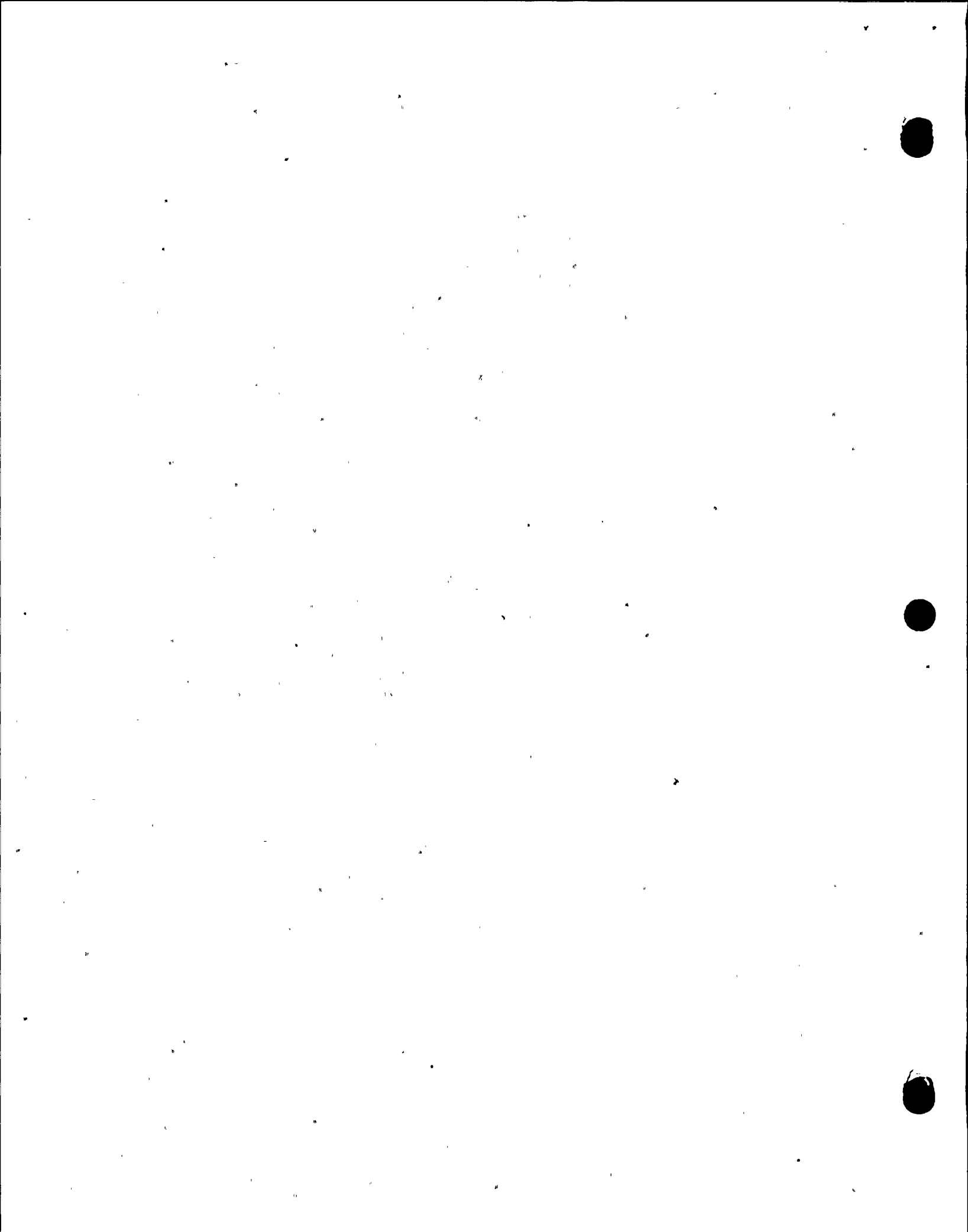
QUESTION: 085 (1.00)

Given the following plant conditions:

- Plant is operating at 100% power.
- RCIC has been inoperable for two days.
- The 'A' RHR pump has been inoperable for two hours.
- The 'A' ESW pump has been inoperable for two days.
- The 'C' ESW pump has just been declared inoperable.
- All other systems are operable.

Select the required action.

- a. Within one hour initiate action to place the plant in Startup within the next 6 hours, Hot Shutdown within the following 6 hours and Cold Shutdown within the subsequent 24 hours.
- b. Restore the RHR 'A' pump to operability within 7 days or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours.
- c. Restore either the 'A' or 'C' ESW pump to operable status within 72 hours or be in at least Hot Shutdown within the next 12 hours and in Cold Shutdown within the following 24 hours.
- d. Restore RCIC to operable status within the next 12 days or be in hot shutdown within the next 12 hours and reduce reactor pressure to less than 150 psig within the following 24 hours.



QUESTION: 086 (1:00)

Given the following conditions on Unit 1:

- The plant is at 100% power on the 100% rod line.
- The Total Feedwater Flow Instrument failed downscale.
- APRM/LPRM readings are not oscillating.

(Unit 1 Power/Flow Map is provided.)

Select the required actions.

- a. Ensure Reactor Recirculation pumps run back to 30% speed.
Increase Core Flow to <55 Mlbm/hr.
- b. Ensure Reactor Recirculation pumps run back to 45% speed.
Increase Core Flow to <55 Mlbm/hr.
- c. Ensure Reactor Recirculation pumps run back to 30% speed.
Insert control rods until below 80% rod line.
- d. Ensure Reactor Recirculation pumps run back to 45% speed.
Insert control rods until below 80% rod line.

QUESTION: 087 (1:00)

Identify the reason injection is prevented until level is less than -60 inches during an ATWS with reactor power greater than 5%.

- a. Lowering level below the moisture separator removes the flowpath to the annulus which minimizes flow through the core.
- b. Lowering level increases the differential pressure between outside the shroud and inside the core which minimizes flow through the core.
- c. Lowering level decreases core voiding which minimizes power oscillations.
- d. Lowering level decreases inlet subcooling which minimizes power oscillations.

QUESTION: 088 (1.00)

Given the following conditions:

- A plant startup is in progress.
- The running CRD pump trips.
- The standby CRD pump cannot immediately be started.
- An NPO is investigating.
- The following control rod positions exist:

Rod 18-43	Position 00
Rod 42-19	Position 00
Rod 42-43	Position 24
Rod 18-19	Position 48

Which of the following conditions would require a manual reactor scram?

- a. Rod 18-19 accumulator alarm comes in.
- b. Rod 42-43 accumulator alarm comes in.
- c. Rod 18-43 and Rod 42-19 accumulator alarms come in.
- d. Rod 42-43 and Rod 18-19 accumulator alarms come in.

QUESTION: 089 (1.00)

With the plant at 100% power, a spurious main steam isolation occurred which resulted in a reactor scram. Reactor water level dipped to Zero inches and is slowly being recovered to +30 inches.

In this condition reactor pressure should be maintained below 1087 in order to:

- a. allow pressure to be in the normal band.
- b. allow resetting the scram.
- c. prevent lifting the lowest set SRV.
- d. allow resetting ARI.

QUESTION: 090 (1.00)

A fire occurred in the control room requiring evacuation before any control room actions could be performed.

Select the method used for inserting control rods from outside the control room.

- a. Opening breakers in RPS power distribution panels.
- b. Removing RPS fuses in accordance with ES-158-001.
- c. Opening RPS EPA breakers.
- d. Venting the scram air header.

QUESTION: 091 (1.00)

Unit 1 is at 100% power when a loss of ESS Channel 'A' 125 VDC Distribution Panel 1D614 occurs. This results in loss of close position indication on RPT breakers 3A and 3B and inoperable EOC-RPT and ATWS-RPT Div 1 trip logic.

Select the expected response of the Reactor Recirculation System.

- a. Pump 1A trips and Pump 1B continues to run.
- b. Pumps 1A and Pump 1B both trip.
- c. Pump 1A continues to run and Pump 1B trips.
- d. Pumps 1A and 1B both continue to run.

QUESTION: 092 (1.00)

During an ATWS, level has been lowered to -62 inches and Table 15 systems are being used to maintain level between -60 inches and -161 inches.

In this condition, which of the following systems would be PREFERRED for controlling level?

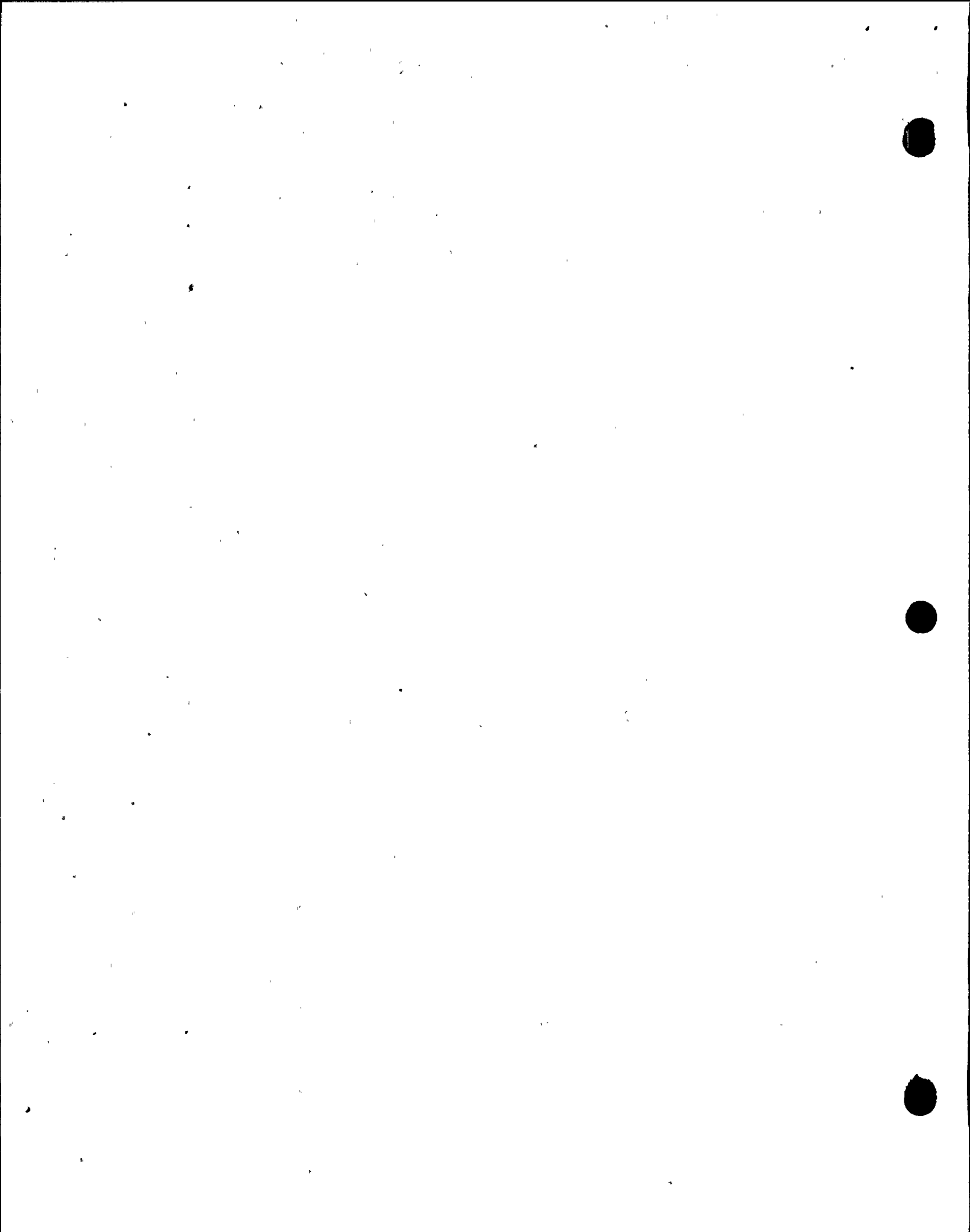
- a. HPCI and RCIC with each taking suction from CST.
- b. HPCI taking suction from CST and LPCI with injection through Heat Exchanger.
- c. RCIC taking suction from CST and CRD maximized as necessary.
- d. RCIC taking suction from CST and LPCI with injection through Heat Exchanger.

QUESTION: 093 (1.00)

EOP 114, RPV Flooding is being performed. Which of the following conditions would allow injection to be terminated in order to determine if water level indication was restored?

(Assume that level indication has been evaluated and is determined to be available and temperature near the reference leg instrument runs is 190 degrees F.)

	Number of Open SRVs	RPV Pressure	Sup Chamber Pressure	Flooding Interval
a.	7	65 psig	10 psig	30 minutes
b.	6	90 psig	8 psig	25 minutes
c.	5	70 psig	5 psig	45 minutes
d.	4	90 psig	3 psig	90 minutes



QUESTION: 094 (1.00)

Given the following conditions:

- An APRM Hi Flux scram occurs. All rods insert fully.
- A trip of both Reactor Recirculation pumps subsequently occurs.
- ON-100-101, Scram, is being executed.
- RPV Steam Dome temperature is 525 degrees F.
- RPV Bottom Head Drain temperature is 375 degrees F.

Under these conditions, ON-100-101, Scram, directs the operator to maintain reactor water level:

- a. below +13 inches in order to hinder natural circulation.
- b. below +30 inches in order to hinder natural circulation.
- c. above +45 inches in order to promote natural circulation.
- d. above +54 inches in order to promote natural circulation.

QUESTION: 095 (1.00)

A loss of Unit 1 RPS Bus 'B' has occurred. Which of the following automatic actions would result?

- a. Containment Isolation Division 2 only.
Channel 'B' Half Scram.
- b. Containment Isolation Division 2 only.
Failure of Auto Start Capability of SBT.
- c. Containment Isolation Divisions 1 and 2.
Channel 'B' Half Scram.
- d. Containment Isolation Divisions 1 and 2.
Failure of Auto Start Capability of SBT.

QUESTION: 096 (1.00)

Given the following conditions:

- Reactor power is 100%.
- Testing is in progress by the Instrument Maintenance Department.
- It is determined at 0800 that neither MSIV in the 'A' main steam line will close on a Low Low Low water level signal.
- At 0900 an attempt is made to manually isolate the main steam line and is unsuccessful.

Select the action REQUIRED by plant Technical Specifications?

- a. Place the plant in at least Hot Shutdown by 2000 today and Cold Shutdown by 2000 tomorrow.
- b. Place the plant in at least Hot Shutdown by 2100 today and Cold Shutdown by 2100 tomorrow.
- c. Place the plant in at least Startup by 1400 today, Hot Shutdown by 2000 today and Cold Shutdown by 2000 tomorrow.
- d. Place the plant in at least Startup by 1500 today, Hot Shutdown by 2100 today and Cold Shutdown by 2100 tomorrow.

QUESTION: 097 (1.00)

Given the following conditions:

- A LOCA occurred resulting in entry to EOP 103, PC Control and EOP 102, RPV Control on high drywell pressure.
- Suppression Chamber Spray was initiated at 10 psig Suppression Chamber pressure. Suppression Chamber pressure and Drywell Pressure continued to rise and are both currently 20 psig.
- Drywell sprays cannot be initiated due to being outside the Drywell Spray Initiation Limit.
- The Containment Post Accident Monitor on panel 1C601 reads 1980 R/hr.

Select the MINIMUM emergency classification.

- a. Unusual Event
- b. Alert
- c. Site Area Emergency
- d. General Emergency

QUESTION: 098 (1.00)

The following equipment is disabled by explosions of unknown origin:

- Transformers 10 and 20.
- All Emergency Diesel Generator Output Breakers

Which of the following would result in emergency classification at the Site Area Emergency level?

(Consider only the conditions listed. Make no assumption about plant status beyond what is stated.)

- a. None of the above equipment can be restored within 10 minutes.
- b. The Shift Supervisor/Emergency Director determines that one redundant train of equipment required to maintain the plant is cold shutdown is damaged.
- c. The Shift Supervisor/Emergency Director determines that disabled equipment will result in a failure of functions needed for public protection.
- d. The Security Shift Supervisor determines that a loss of control of a vital areas have occurred.

QUESTION: 099 (1.00)

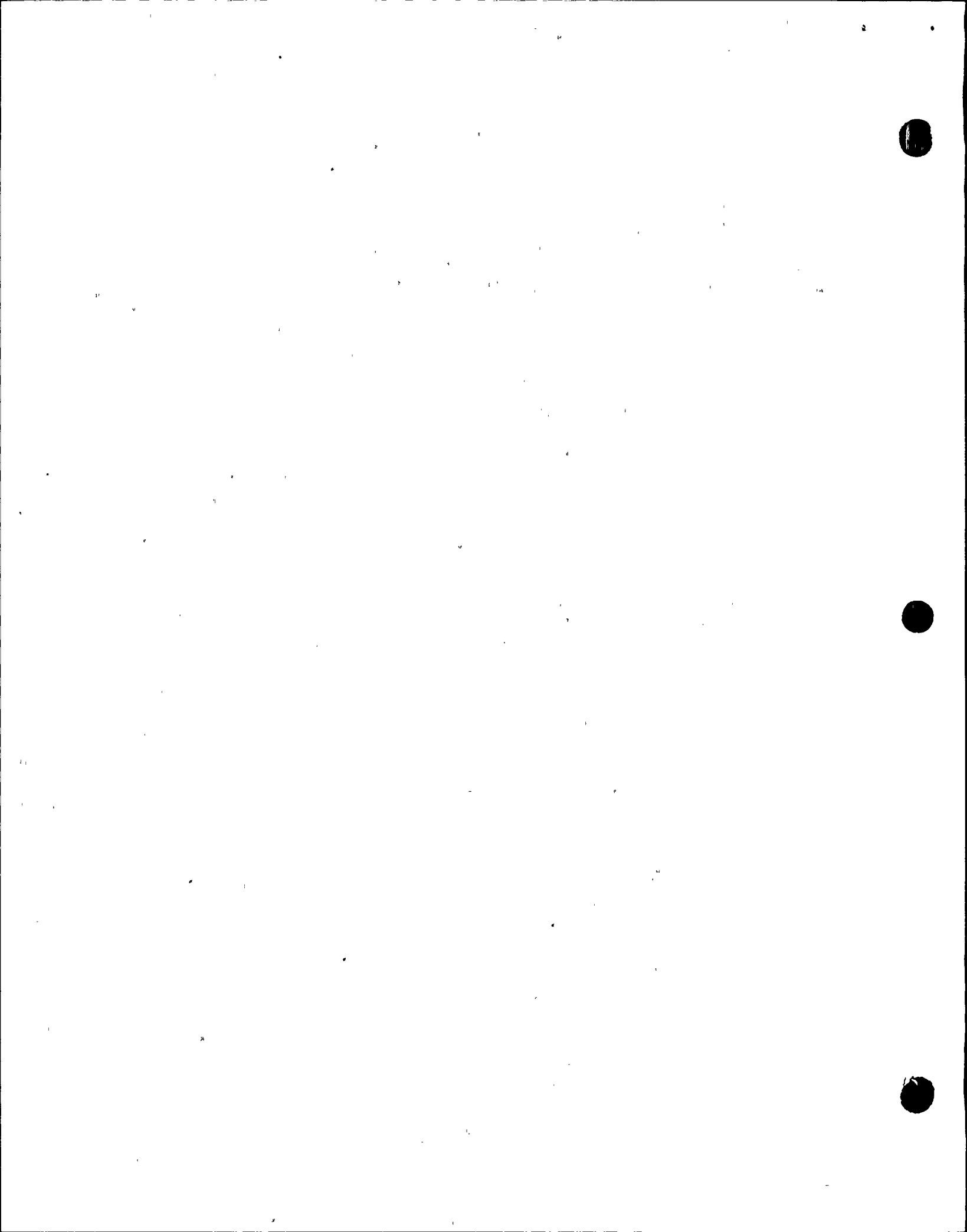
The following conditions exists:

- A LOCA has occurred.
- Reactor water level is below 0" and is continuing to drop.

As level drops, which of the following would first require Site Evacuation of non-essential personnel?

Water level drops below:

- a. -129 inches on panel 1C651.
- b. TAF on Fuel Zone Level Indicator.
- c. TAF on Fuel Zone Level Indicator for 3 minutes.
- d. TAF on Fuel Zone Level Indicator for 20 minutes.



QUESTION: 100 (1.00)

Given the following conditions:

- The plant has experienced a LOCA which resulted in fuel damage.
- Drywell spray cannot be initiated due to one drywell spray valve in each loop being stuck in the closed position.
- The Emergency Director has determined that drywell spray must be initiated immediately in order to reduce containment pressure and limit the escape of radioactive effluents.
- An operator has been designated to enter the reactor building and manually open the drywell spray valves.
- Reactor building radiation levels in the area of the drywell are approximately 50 Rem/hr.

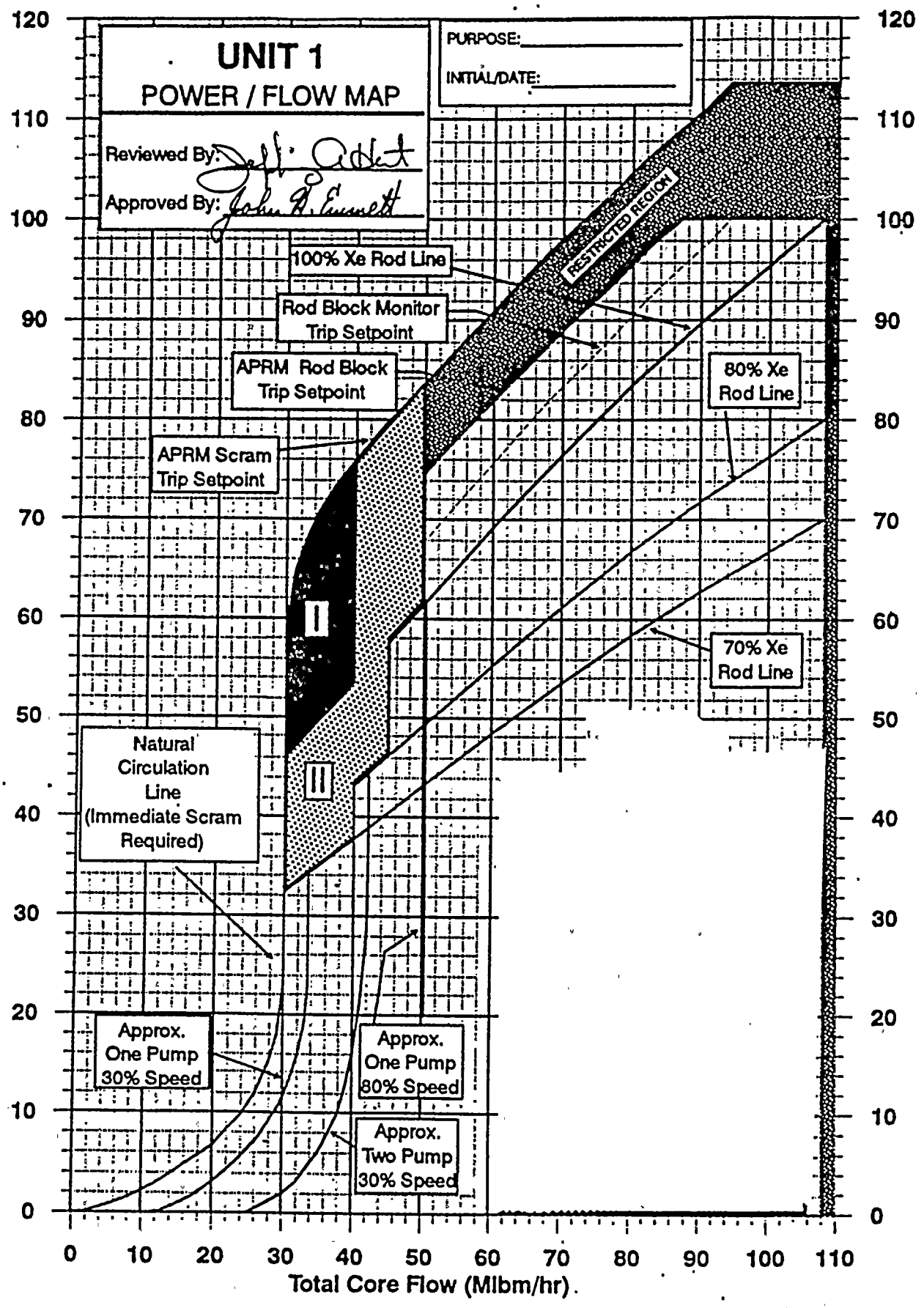
With proper approval, the Total Effective Dose Equivalent for this operator may be extended to a MAXIMUM of:

- a. 5 Rem.
- b. 10 Rem.
- c. 25 Rem.
- d. 50 Rem.

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

UNIT ONE, POWER vs. FLOW MAP

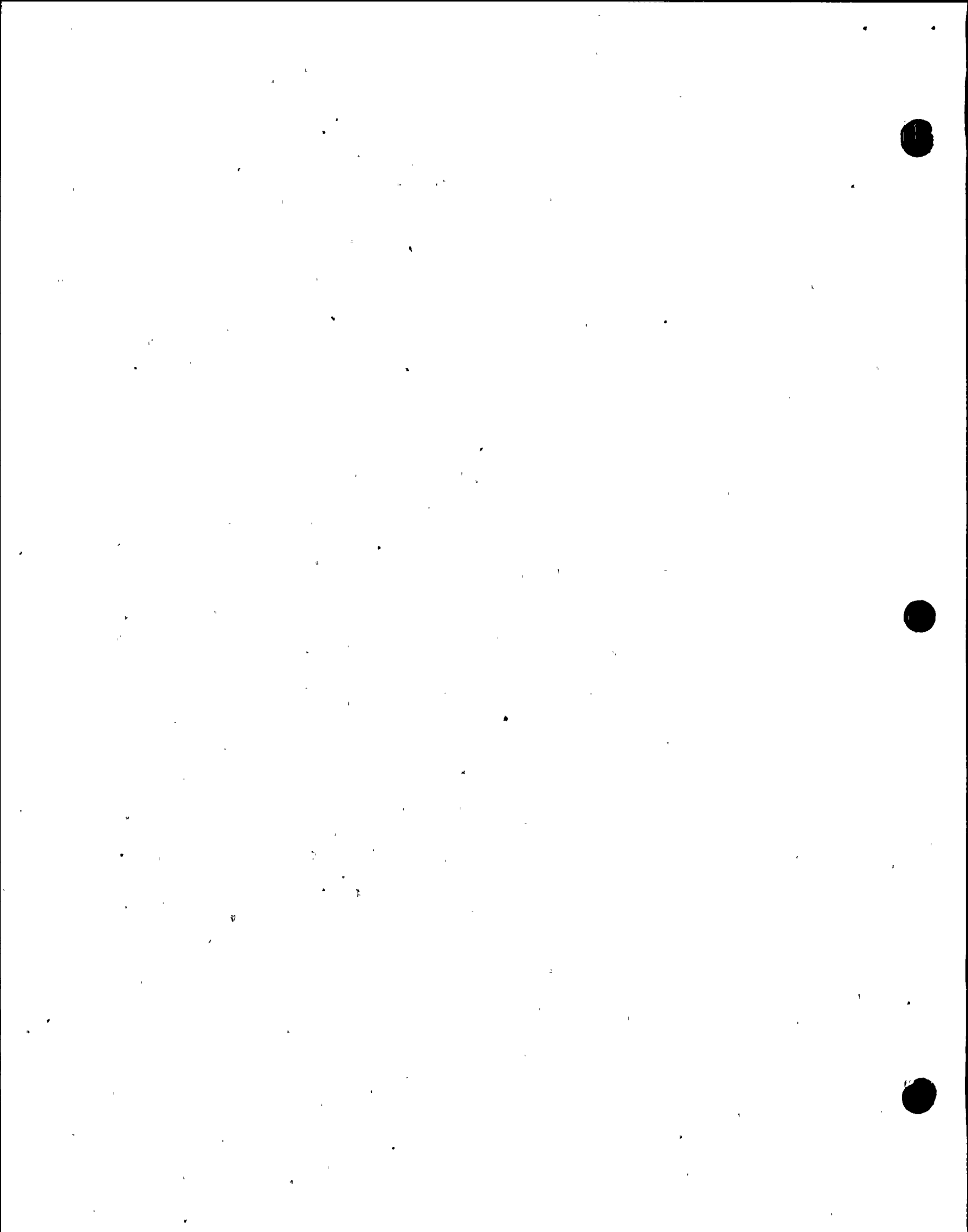
Thermal Power (% RATED)



7
-
5
P
4
P

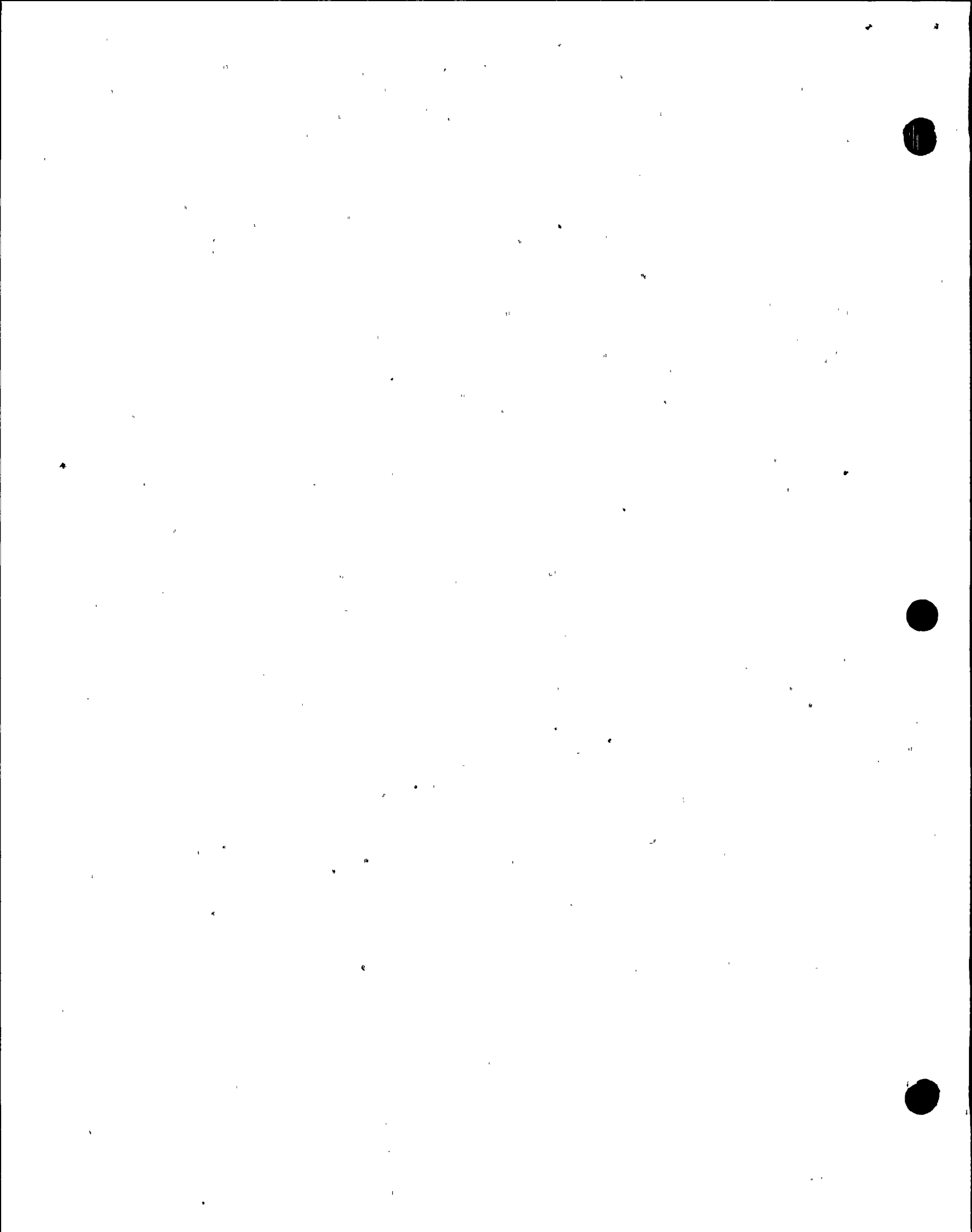
A N S W E R K E Y

MULTIPLE CHOICE			
001	c	023	c
002	d	024	a
003	b	025	b
004	d	026	d
005	d	027	d
006	c	028	a
007	b	029	d
008	c	030	a
009	d	031	d
010	c	032	c
011	d	033	c
012	a	034	b
013	b	035	b
014	b	036	b
015	a	037	a
016	c	038	a
017	c	039	d
018	c	040	b
019	b	041	a
020	b	042	c
021	a/b	043	d
022	b	044	a
		045	a



ANSWER KEY

046	c	069	a
047	b	070	c
048	c	071	c
049	d	072	d
050	b	073	c
051	a	074	c
052	c	075	a
053	d	076	c
054	d	077	a
055	c	078	d
056	b	079	a
057	a	080	d
058	a	081	d
059	d	082	b
060	b	083	c
061	d	084	d
062	c	085	a
063	c	086	c
064	a	087	d
065	d	088	d
066	b	089	b
067	c	090	a
068	b	091	b



A N S W E R K E Y

092 a

093 d

094 b

095 c

096 a

097 d

098 c

099 c

100 b

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



ATTACHMENT 3
FACILITY COMMENTS ON WRITTEN EXAMINATIONS



April 18, 1996

Mr. Don Florek
US Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Susquehanna Training Center
SRO/RO Written Examination
PLA 4449 File A14-13D

Dear Mr. Florek:

Enclosed are the comments concerning the Senior Reactor Operator and Reactor Operator written examination administered at Susquehanna on Monday, April 15, 1996. The Operations Training Staff reviewed the examination and provide the following:

Question #19 RO/# 21 SRO

This question solicits knowledge of the response of Main Turbine Bypass Valves during a loss of vacuum event. We believe that the wording of the question stem is such that choice "b" is not incorrect because of the pressure listed, the MSIVs would have auto closed and the "heat sink " would not be available. (Ref. ON-143-001, Loss of Condenser Vacuum, attached)

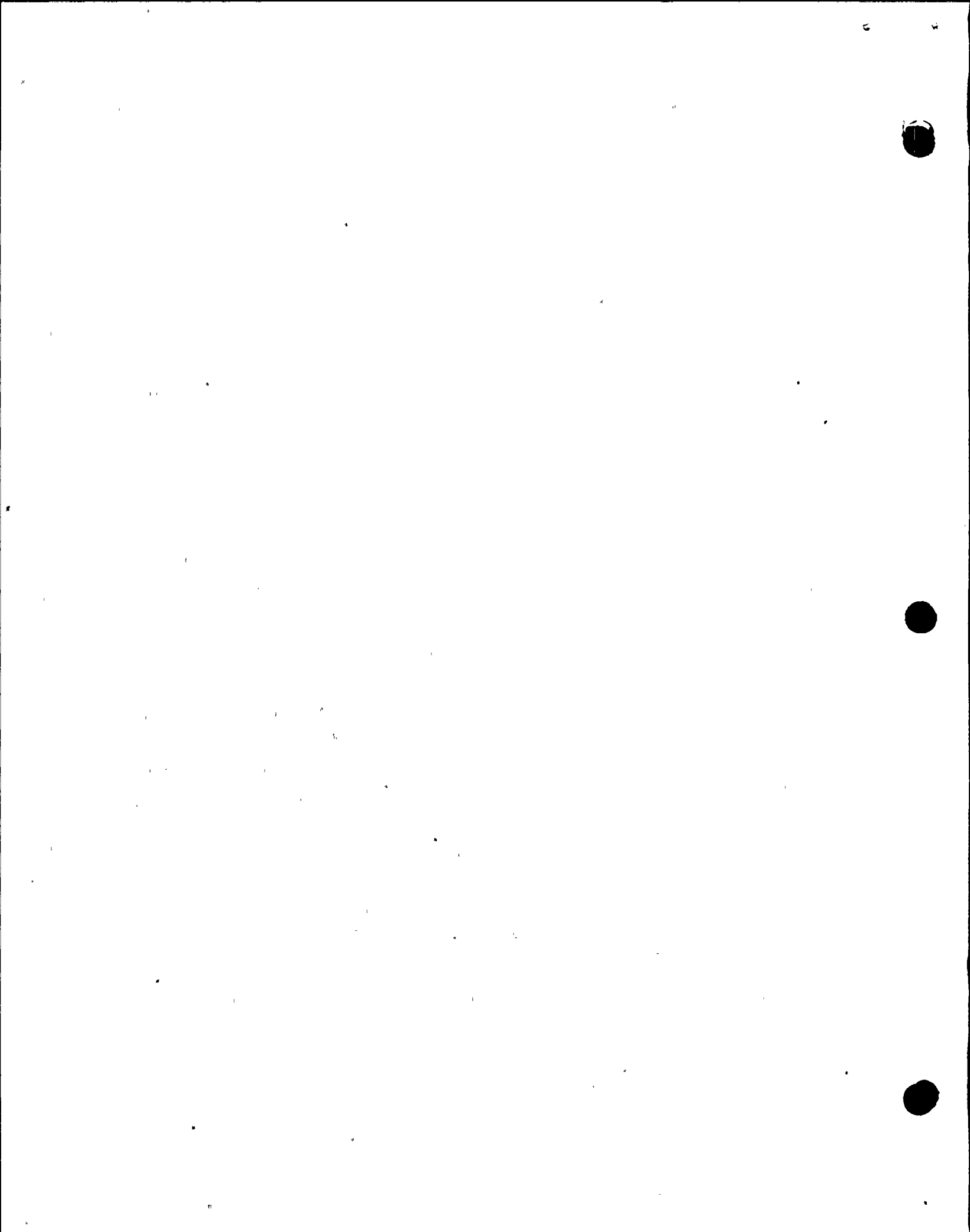
Recommend accepting answers "a" and "b" as correct.

Question #31 RO

This question solicits the operators response to fitness for duty requirements. We believe that choice "b" is not incorrect as it offers the correct answer plus additional information that is acceptable. (Ref. FFD Program Manual, Section 10.0 Call-Out Situations, attached).

Recommend accepting answers "a" and "b". as correct.





Question #48 RO/#48 SRO

This question solicits knowledge about indications and plant response to a Jet Pump failure. We believe that wording in the stem can result in choice "b" or "c" being correct based on interpretation of the phrase "Indicated recirculation loop flow in the loop with the failed jet pump." If the candidate interprets loop flow as drive flow, then choice "b" is not an incorrect choice. (Ref. SSES "Hot Box" required reading for operators, attached).

Recommend accepting answers "b" and "c" as correct.

Question #56 RO

This question solicits knowledge of minimum reactor vessel temperatures. Based on SSES procedure for Shutdown Cooling, choice "a" is not an incorrect choice. The procedure identifies two instances of minimum temperature; they are 80 degrees with fuel in the vessel and 70 degrees with the vessel defueled, therefore, "at all times" you are required to be greater than 70 degrees. Based on SSES Technical Specifications requirement of 70 degrees whenever the head bolts are under tension choice "b" is not incorrect. (Ref. OP-149-002, RHR Operation in Shutdown Cooling Mode, attached).

Recommend accepting answers "a" and "b" as correct.

Question #100 RO/#100 SRO

This question solicits knowledge of emergency dose levels during plant emergencies. The stem asks for the maximum allowed dose to prevent the escape of radioactive effluents. Depending on the interpretation of the severity of the stated conditions, choice "c" is not incorrect. 25 Rem is the "Maximum" allowable dose that an operator would be allowed to receive to perform actions to protect large populations. (Ref. PP&L Emergency Personnel Dose Assessment and Protective Action Recommendation, attached).

Recommend accepting answers "b" and "c" as correct.

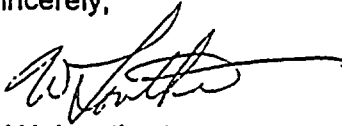
April 17, 1996

Page 3

PLA 4449
File A14-13D

We appreciate your consideration of these comments and look forward to information concerning their disposition.

Sincerely,



W.H. Lowthert
Manager Nuclear Training

Response: Yes

cc: C. Fedako
A. S. Fitch
NTG File
Nuc Records-Site

asf1496

WHL/ASF/vah

ATTACHMENT 4

NRC RESOLUTION OF FACILITY COMMENTS ON WRITTEN EXAMINATION

- SRO-21/RO-19 Facility comment accepted. The answer key was revised to accept a and b as correct answers.
- RO-31 Facility comment accepted. The answer key was revised to accept both a and b as correct answers.
- SRO-48/RO-48 Facility comment not accepted. The reference provided supported that indicated recirculation loop flow will increase not decrease if the applicant correctly assumed indicated recirculation loop flow was drive flow.
- RO-56 Facility comment accepted. The answer key was revised to accept a and b as correct answers
- SRO-100/RO-100 Facility comment not accepted. The question clearly described the situation was "to prevent the escape of radioactive effluents" not to perform actions to protect large populations.



ATTACHMENT 5

SIMULATION FACILITY REPORT

Facility License: NPF-14

Facility Docket No: 50-387

Operating Test Administration: April 15-19, 1996

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

ITEM

DESCRIPTION

None

187

