

07.212.91

NINE MILE POINT NUCLEAR STATION UNIT #2  
OPERATING PROCEDURE  
PROCEDURE NO. N2-OP-36B  
REDUNDANT REACTIVITY CONTROL SYSTEM

<u>APPROVALS</u>	<u>SIGNATURES</u>	<u>DATE AND INITIALS</u>		
		<u>REVISION 0</u>	<u>REVISION 1</u>	<u>REVISION 2</u>
Superintendent Operations NMP Unit #2 M.D. Jones	<u>M.D. Jones</u>	4/25/86 <u>MT</u>	8/7/86 <u>MT</u>	
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General Superintendent Nuclear Generation T.J. Perkins	<u>T.J. Perkins</u>	4/25/86 <u>TJP</u>	8/18/86 <u>TJP</u>	

FOR INFORMATION ONLY

Summary of Pages (Continued on Cover Sheet #2)

Revision 1 (Effective 8/8/86 )

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2	September 1989 (Publication Change)
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Periodic Review, (8/21/90), No Changes	

This procedure supersedes N2-IOP-36B, Rev. 1

NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE USED  
AFTER AUGUST 1992  
SUBJECT TO PERIODIC REVIEW.

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NINE MILE POINT NUCLEAR STATION UNIT #2

OPERATING PROCEDURE

PROCEDURE NO. N2-OP-36B

REDUNDANT REACTIVITY CONTROL SYSTEM

Coversheet Continuation (Page 2)

Summary of Pages (Cont'd)

<u>Pages</u>	<u>Date</u>
i,5-8,9-21,24-26	January 1991 (TCN-16)
3	April 1991 (Publication Change *4)
8a,8b,8c,22,23	June 1991 (TCN-17)

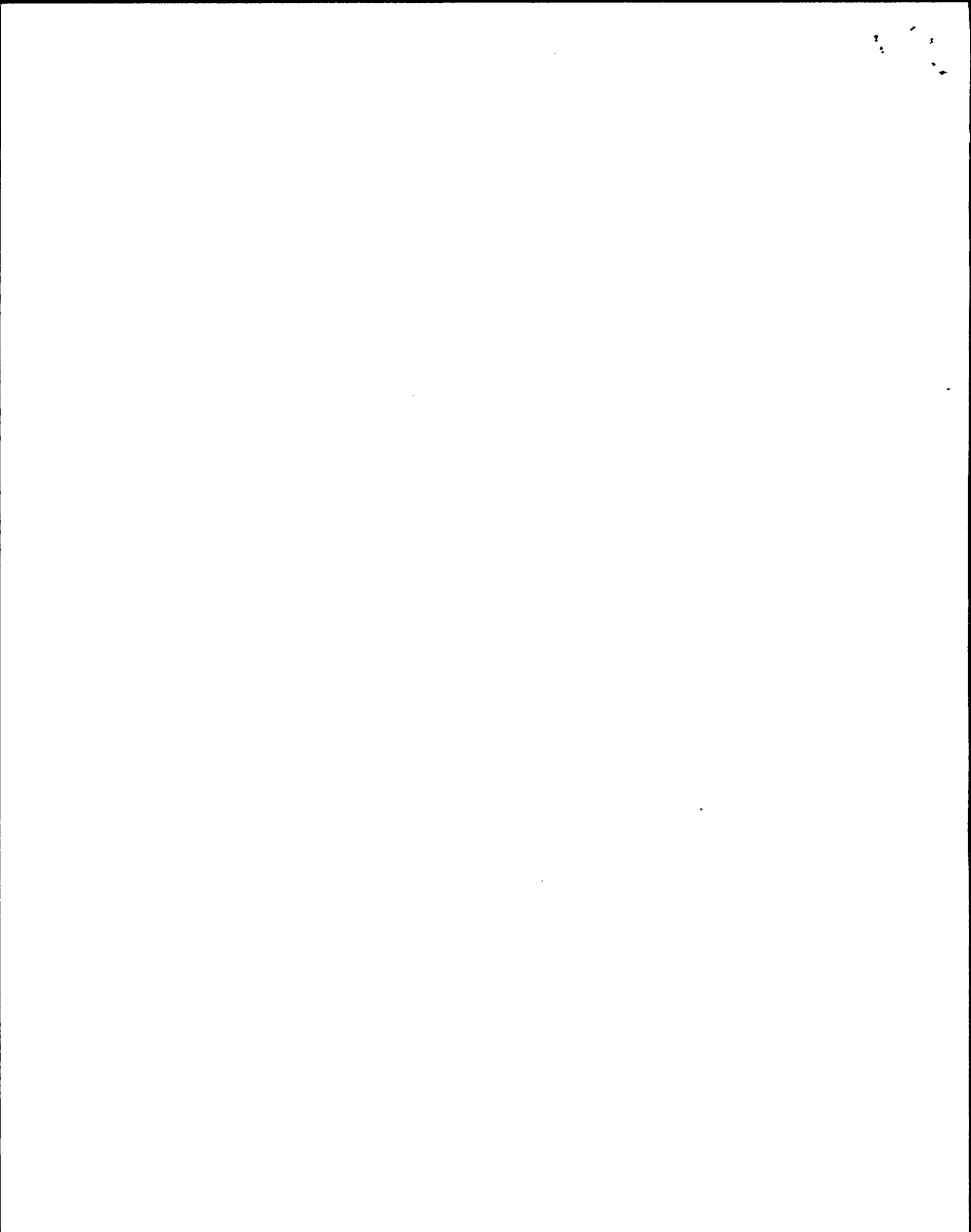


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REFERENCES

1.0	FSAR	
	Section 7.6	
2.0	Flow Diagrams	
	NONE	
3.0	Electrical Diagrams	
	GE 944E309TY sheets 1-41 Redundant Reactivity Control System	

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REDUNDANT REACTIVITY CONTROL SYSTEM

A: TECHNICAL SPECIFICATIONS

Technical Specification 3.3.4.1 (ATWS-RPT)  
Technical Specification 3.1.5 (Standby Liquid Control)

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B. SYSTEM DESCRIPTION

The redundant reactivity control system (RRCS) is designed to mitigate the potential consequences of an anticipated transient without scram (ATWS) event.

The RRCS consists of vessel pressure and level sensors, solid state logic, control room cabinets and indications, and interfaces with several systems which may be actuated to mitigate an ATWS event. The solid state logic is divided into Divisions 1 and 2, each of which is subdivided into two channels. The logic is energized to trip, and both channels of either division must be tripped in order to initiate the RRCS protective actions. The system can be manually initiated by depressing two pushbuttons (tripping both channels) in the same division. This manual initiation function is designed so that no single operator action can result in an inadvertent initiation. The pushbutton's collar is rotated to arm the switch and depressing will trip the logic. The manual initiation pushbuttons are located in the control room near the Reactor Protection System (RPS) manual scram pushbuttons. There are four manual initiation pushbuttons for RRCS.

The RRCS logic monitors reactor dome pressure and water level. High pressure or low water level (Level 2) or RRCS manual initiation will cause the alternate rod insertion (ARI) valves to scram the reactor independently of the reactor protection system.

Low water level alone will, in addition to an ARI scram, cause an immediate recirculation pump trip (RPT) by tripping the 60 Hz circuit breakers (in the normal supply lines to the recirculation pump motors), and the 15 Hz circuit breakers (in the LFMG supply to the pump motors). After 98 sec of continued low water level, and if the APRM channels are not downscale or are inoperative (INOP), the RRCS initiates Standby Liquid Control (SLS) and isolates the reactor water cleanup (WCS) system

High reactor pressure alone will, in addition to an ARI scram, immediately trip the 60 Hz circuit breakers and initiate transfer of the recirculation pumps to LFMG (low speed) operation. After 25 sec of continued high pressure, and if the Average Power Range Monitor (APRM) channels are not downscale or are INOP, the RRCS trips the 15 Hz circuit breakers to complete the RPT and also initiates feedwater runback and feedwater min flow valves fail open, both sealed in for 25 seconds. After an additional 73 sec of continued high pressure and with the APRM channels still not downscale or are INOP, the RRCS initiates SLS and isolates WCS.

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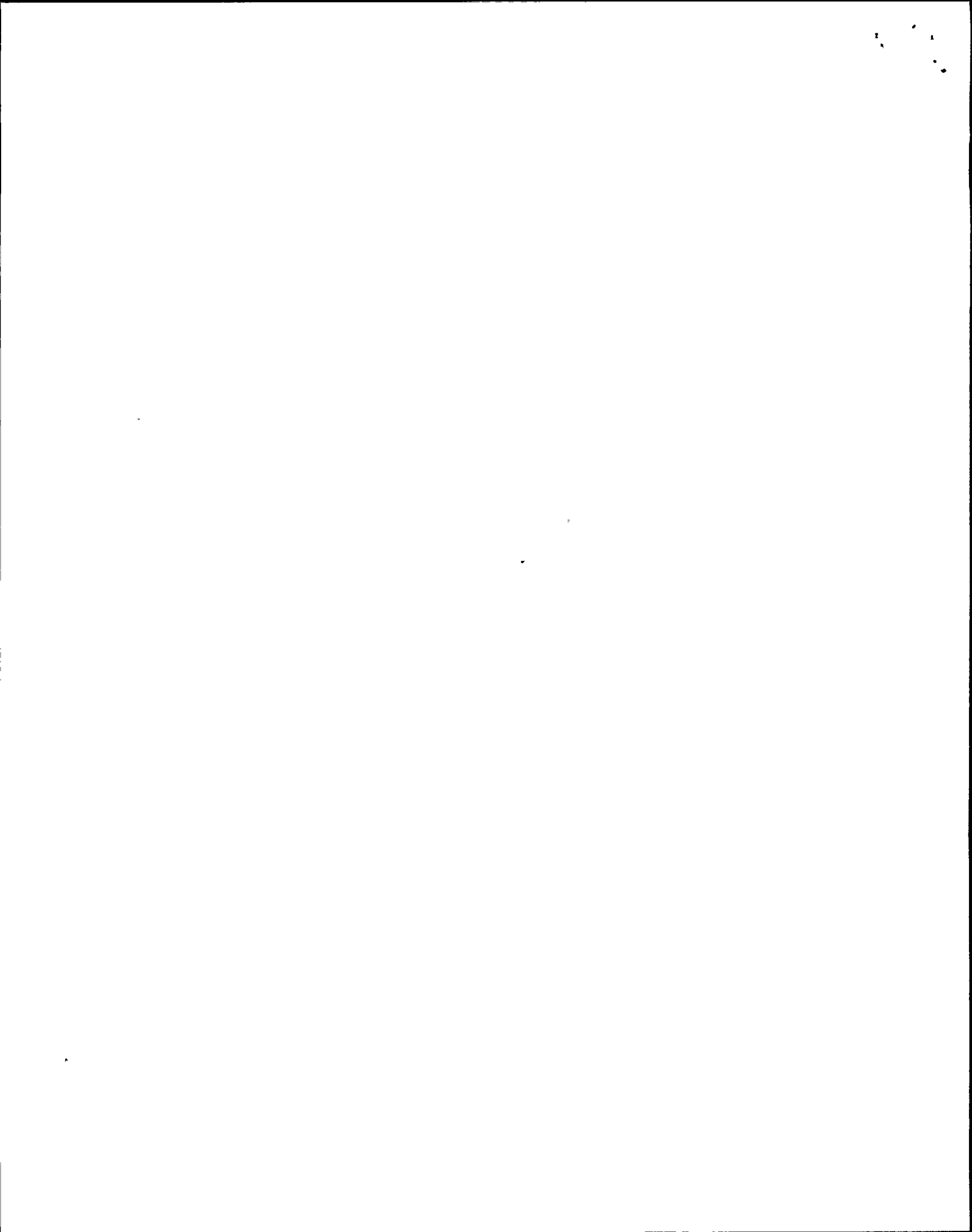
Manual initiation alone causes an immediate ARI scram. After 98 sec, if the APRM channels are not downscale or are INOP, the RRCS initiates SLS and isolates WCS. Manual initiation does not cause an RPT or feedwater runback.

The APRMs provide downscale trip signals to the RRCS permissive logic. These signals are Class 1E and contain all available channels of input. APRM signals from (NMS) Divisions 1 and 2 are routed to RRCS Division 1 through isolators, and APRM signals from NMS Division 3 and 4 are sent to RRCS Division 2 through isolators. Loss of power to an APRM channel or an APRM INOP condition will result in an RRCS permissive signal. Bypassing an APRM channel will prevent the bypassed APRMs "not downscale" or INOP signals from supplying a permissive.

Approximately 10 minutes and 98 seconds after RRCS initiation, the RRCS logic (except for ARI initiation) can be reset by means of four manual reset pushbuttons (one for each channel) if the reactor level is above Level 2 and reactor pressure is below the setpoint. Operator control of the feedwater system can be regained 25 sec after initiation of the RRCS feedwater runback, independent of APRM power. The RRCS ARI function is reset by the RRCS ARI reset pushbuttons. This second set of four pushbuttons (one for each channel) allow reset of the ARI logic 30 sec after initiation of ARI provided that initiating signals have cleared. This 30-sec time delay before the ARI reset permissive appears ensures that the RRCS ARI scram goes to completion. \*

The RRCS is continuously checked by a solid state microprocessor-based self-test system. This system checks RRCS sensors, logic, and protective devices.

The RRCS provides the operator with pertinent information as to its condition via status lights and annunciators. This includes indication of the various stages of the RRCS logic actuation such as ARI scram initiation, recirculation pump transfer to LFMG, recirculation pump trip, feedwater runback, SLS initiation, WCS isolation, and both potential and confirmed ATWS. An RRCS trouble annunciator is provided to signal a test fault, Analogue Trip Module (ATM) in calibration or gross failure, or any of several RRCS logic state changes. Loss of power to RRCS is signaled by the RRCS out-of-service annunciators.



C. PLANT OPERATING REQUIREMENTS

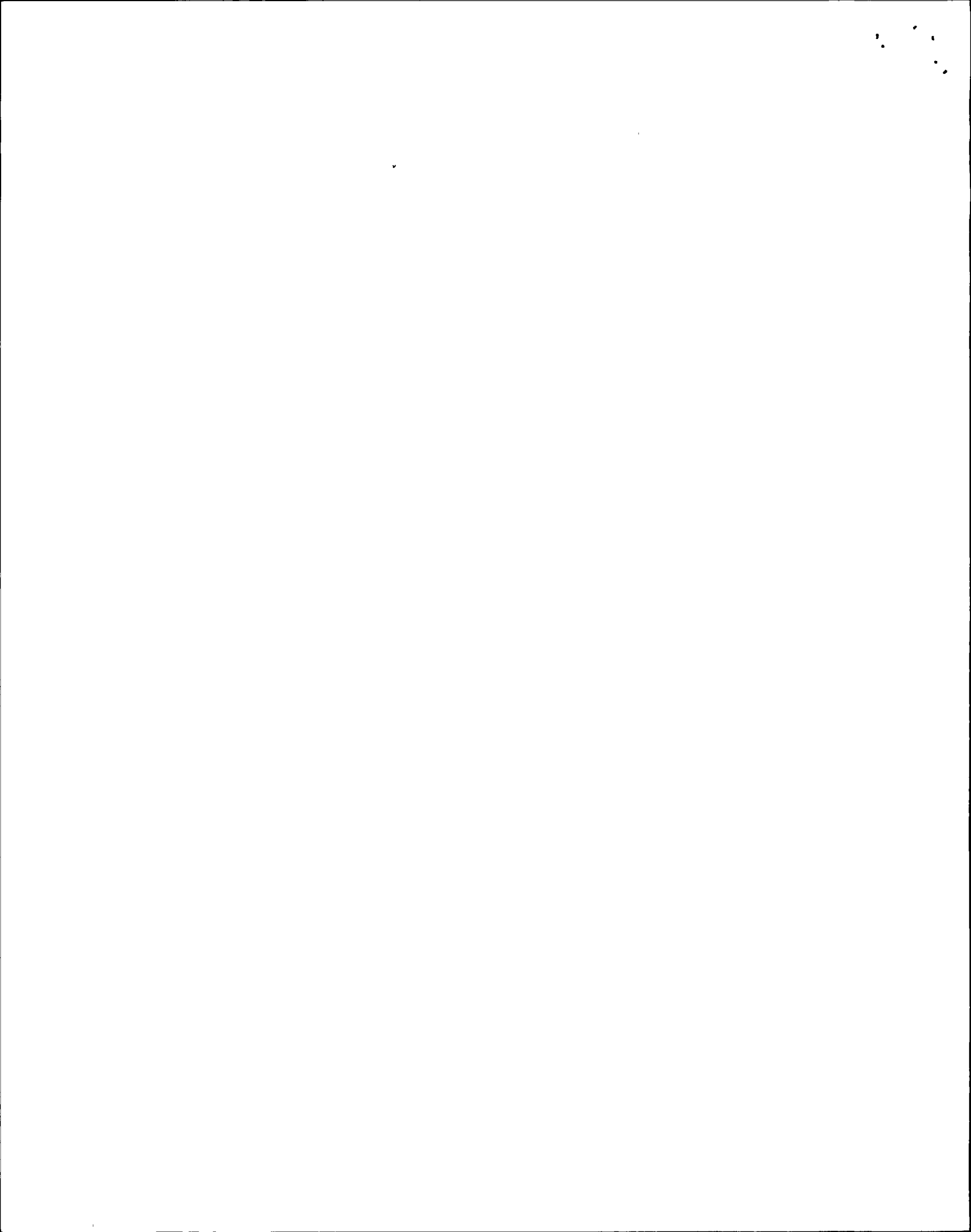
1.0	<u>Systems</u>	
1.1	Standby and Emergency AC Distribution	N2-OP-72
1.2	Normal DC Distribution	N2-OP-73A
1.3	24V DC Distribution	N2-OP-73B
1.4	Emergency DC Distribution	N2-OP-74
1.5	Neutron Monitoring	N2-OP-92
1.6	Standby Liquid Control	N2-OP-36A
1.7	Nuclear Boiler Instrumentation/ADS	N2-OP-34
1.8	Condensate and Feedwater	N2-OP-3

D. PRECAUTIONS/LIMITATIONS

1. If Standby Liquid Control is inadvertently initiated, initiation can be terminated by taking both Standby Liquid Pump PlA and PlB Keylock control switches momentarily to the STOP position at P601.
2. Division I consists of Channel A and Channel B, and Division II consists of Channel A and Channel B. Both Channels must be reset/energized to reset/initiate that Division.
3. "The RRCS FW Runback Disable" switch (C33A-S6) should be used to inhibit the RRCS Auto FW runback signal during surveillance testing of the RRCS System, when spurious ATWS trip signals may occur.
4. If RRCS becomes inoperable due to a loss of power, the SLS Tank Low Level Pump Start Interlocks will open and prevent SLS injection. Refer to N2-OP-36A Section H.6.0 to jumper out SLS tank low level pump interlock. \* 4

E. STARTUP PROCEDURE

- 1.0 Startup From Inoperable Status
- 1.1 Verify the following at P603:
  - a. RPV Water Level greater than 108.8 inches.
  - b. RPV Pressure less than 1050 psig.
- 1.2 Perform Major Component Power Supply lineup per Table II.
- 1.3 Depress Division I and II ARI RESET pushbuttons at P603.
- 1.4 Depress Division I and II RRCS RESET pushbuttons at P603.



F. NORMAL OPERATION

1.0 Standby Condition Status Checks

1.1 Verify the following:

- a. Section E.1.0 complete, per this procedure.
- b. No abnormal system condition status lights on at Relay Room local panels C22-P001 and P002.
- c. Switch C33A-S6, on panel 2CEC\*PNL603 is in the "OFF" position.

G. SHUTDOWN

1.0 Division I (II) Shutdown To Inoperable Status

CAUTION:

THIS WILL DISABLE ATWS-RPT CRKTY, SEE TECHNICAL SPECIFICATION 3.3.4.1.

THIS WILL ALSO DISABLE DIVISION I (II) STANDBY LIQUID CONTROL BY SEALING IN A PUMP 1A(B) LOW STORAGE TANK LEVEL TRIP SIGNAL WHEN RRCS LOGIC POWER IS TURNED OFF. REFER TO TECHNICAL SPECIFICATIONS.

- 1.1 Place Division I (II) power supply switches to OFF per Table II of this procedure.

2.0 Initiation Reset

- 2.1 To reset RRCS ARI initiation signal, perform the following at P603:

CAUTION:

PRIOR TO RESETTING ARI, REFER TO N2-OP-101C SECTION H.2 POST SCRAM RECOVERY.

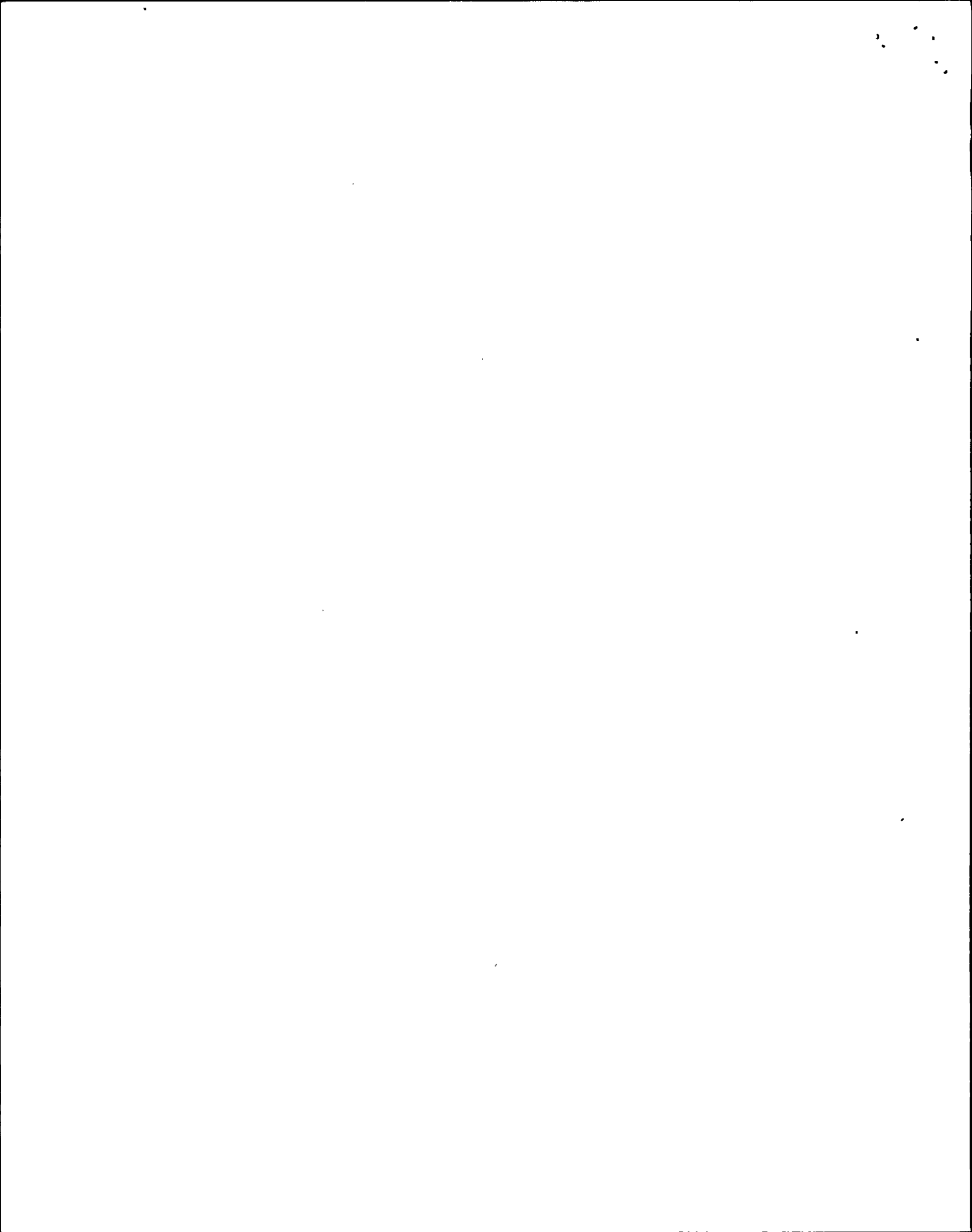
NOTE: This logic is sealed in for 30 seconds after initiation.

- a. Verify Division I RRCS ARI READY FOR RESET amber light on.
- b. Verify Division II RRCS ARI READY FOR RESET amber light on.
- c. Depress Division I and II ARI RESET pushbuttons.

- 2.2 To reset RRCS initiation signal, perform the following:

NOTE: This logic is sealed in for 10 minutes and 98 seconds after initiation. Resetting this logic resets SLC, RCS Pump Trip, and FWS Transfer to manual logic.

- a. Verify Division I RRCS READY FOR RESET amber lights on, at P603.
- b. Verify Division II RRCS READY FOR RESET amber lights on, at P603.

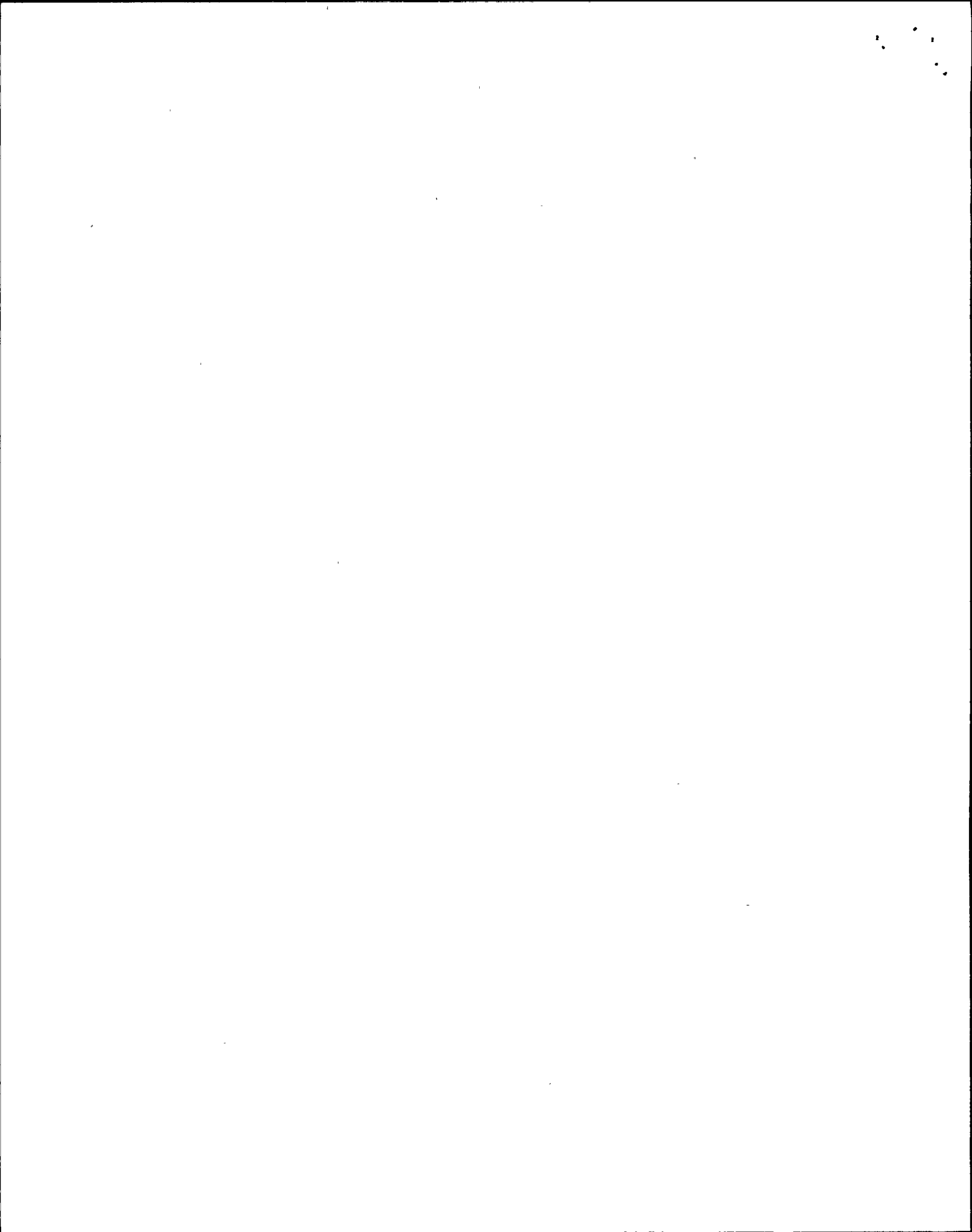


- c. Depress Division I and II RRCS RESET pushbuttons.
- d. Shutdown Standby Liquid Control System, as required, per N2-OP-36A.

H. OFF NORMAL PROCEDURES

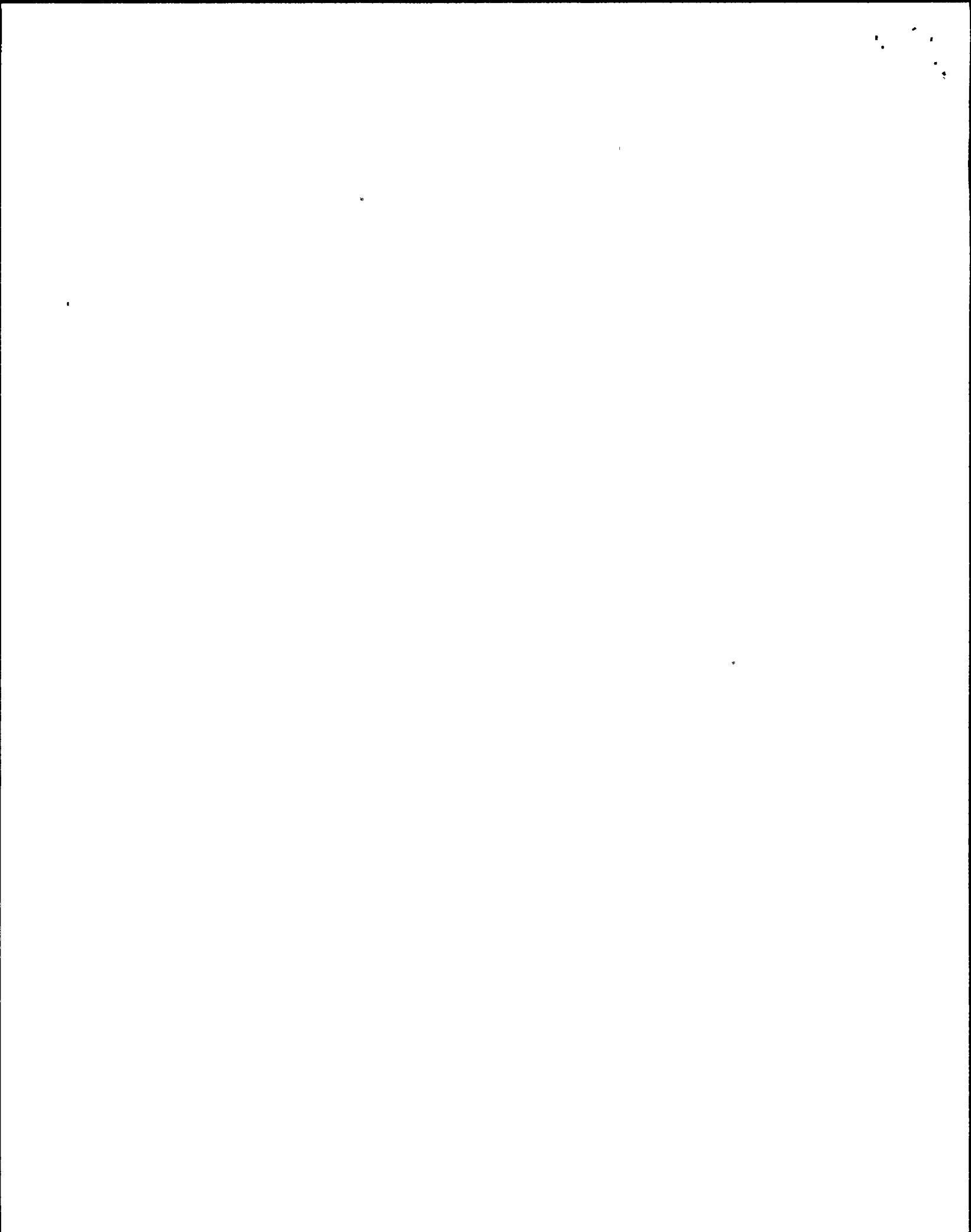
- 1.0 This step has been deleted.
- 2.0 This step has been deleted.
- 3.0 RPV High Pressure Auto Initiation
- 3.1 Verify RPV pressure greater than 1050 psig.
- 3.2 Verify the following occurs immediately upon receipt of initiation signal:
  - a. A Reactor Scram occurs.
  - b. Reactor Recirculation Pumps transfer to LFMG power supply.
  - c. Division I and II RRCS ARI INITIATE amber light on at P603.
- 3.3 Verify the following occurs 25 seconds after receipt of initiation signal, concurrent with APRM's not downscale (or INOP):
  - a. Reactor Recirculation Pumps LFMG power supply trips.
  - b. Feedwater flow control runback initiates and feedwater min flow valves fail open. (Sealed in for 25 seconds).
- 3.4 Verify the following occurs 98 seconds after receipt of initiation signal, concurrent with APRM's not downscale (or INOP):
  - a. Reactor Water Cleanup System isolates.
  - b. Standby Liquid Control System initiates.
- 3.5 Reset initiation signal, as required per G.2.0 of this procedure.
- 4.0 RPV Low Water Level Auto Initiation
- 4.1 Verify RPV water level less than 108.8 inches (Level 2).
- 4.2 Verify the following occurs immediately upon receipt of initiation signal:
  - a. A Reactor Scram occurs.
  - b. Reactor Recirculation Pumps trip.
  - c. Division I and II RRCS ARI INITIATE amber light on at P603.

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- 4.3 Verify the following occurs 98 seconds after receipt of initiation signal, concurrent with APRM's not downscale (or INOP):
- a. Reactor Water Cleanup System isolates.
  - b. Standby Liquid Control System initiates, per N2-OP-36A.
- 4.4 Reset initiation signal, as required, per G.2.0 of this procedure.
- 5.0 To Deenergize One Division of RRCS
- NOTE: All steps to be done in exact sequence specified in Sections 5.2 and/or 5.3.
- NOTE: Refer to Technical Specification 3.3.4.1 (ATWS-RPT), see Section G for other inoperabilities.
- 5.1 Obtain SSS and CSO permission to deenergize one division of RRCS (specify which division is to be deenergized) and document the permission in the SSS Log.
- 5.2
- a. To deenergize Division I of RRCS (logic power only) proceed to panel C22-P001 in the Relay Room, and open rear door of the center bay.
  - b. Place switches S1A and S2A on upper power supply board to OFF.
  - c. Place switches S1A and S2A on lower power supply board to OFF.
  - d. Close center bay rear door, and open center bay lower front door.
  - e. Carefully remove fuse F267 (also labeled F5A) and fuse F268 (also labeled F6A) to be controlled by a holdout issued to the SSS. This deactivates the ARI function.
  - f. Division I of RRCS (logic power only) is now deenergized.
- 5.2.1 Refer to N2-OP-36A Section H.6.0 as required to defeat SLS Tank Low Level Interlocks to maintain SLS "A" operability.
- 5.3
- a. To deenergize Division II of RRCS (logic power only) proceed to panel C22-P002 in the Relay Room, and open rear door of the center bay.
  - b. Place switches S1A and S2A on upper power supply board to OFF.
  - c. Place switches S1A and S2A on lower power supply board to OFF.
  - d. Close center bay rear door, and open center bay lower front door.



5.3 (Cont)

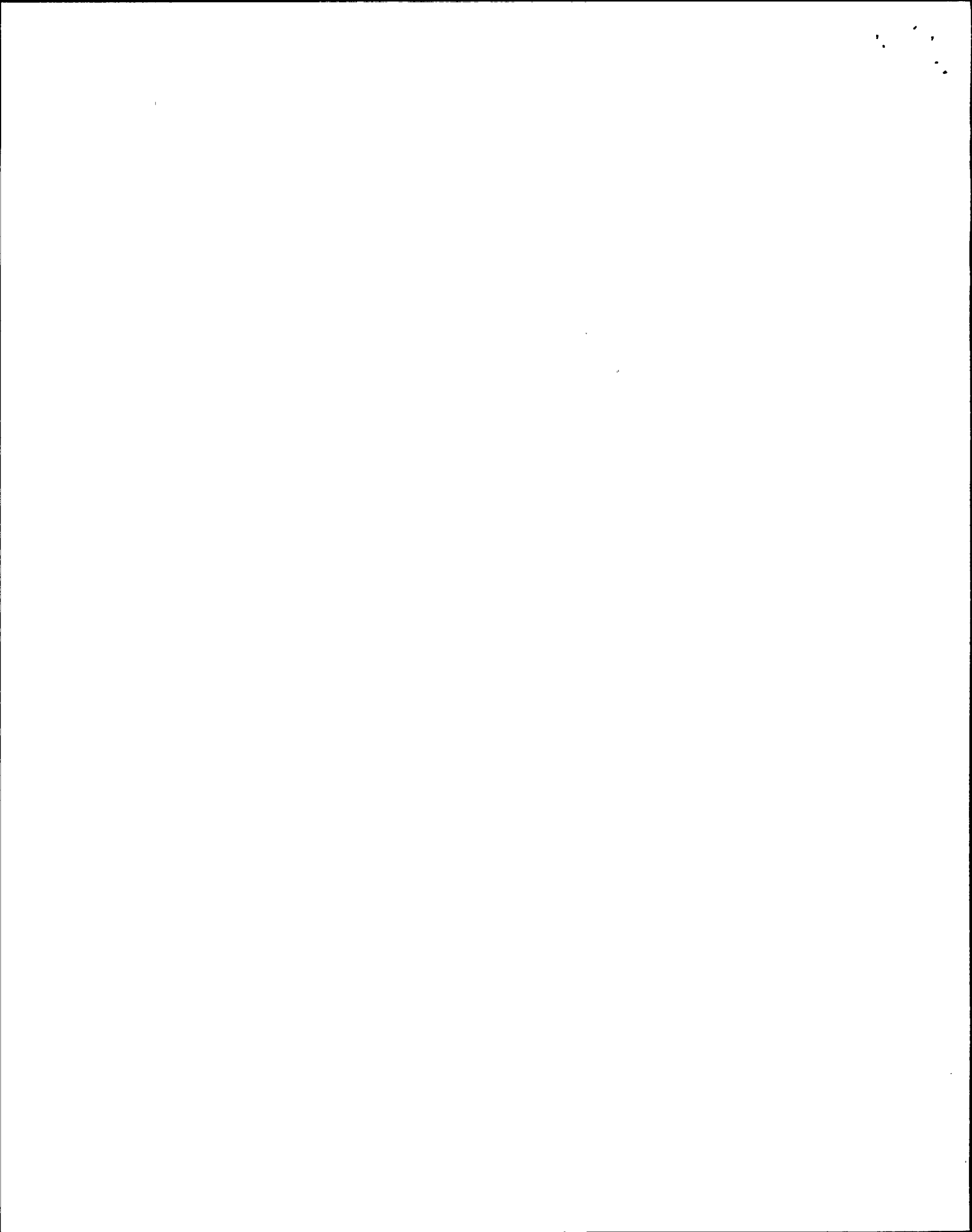
- e. Carefully remove fuse F267 (also labeled F5B) and fuse F268 (also labeled F6B) to be controlled by a holdout issued to the SSS. This deactivates this ARI function.
  - f. Division II of RRCS (logic power only) is now deenergized.
- 5.3.1 Refer to N2-OP-36A Section H.6.0 as required to defeat SLS Tank Low Level Interlocks to maintain SLS "B" operability.

6.0 To Reenergize One Division of RRCS

WARNING:

WHEN RRCS IS REENERGIZED, IT IS POSSIBLE THAT VOLTAGE SPIKES COULD CAUSE ACTIVATION OF THE FOLLOWING: ATWS RECIRC PUMP TRIP; ATWS RECIRC PUMP DOWNSHIFT TO 15 HZ; FEEDWATER FLOW CONTROL VALVE RUNBACK (TO SHUT); STANDBY LIQUID CONTROL SYSTEM INJECTION; WCS ISOLATION.

- 6.1 Obtain SSS and CSO permission to reenergize one division of RRCS (specify which division is to be reenergized) and document the permission in the SSS Log.
- 6.1.1 If N2-OP-36A Section H.6.0 was used to defeat the SLS Tank Low Level Interlocks, remove jumpers as directed in N2-OP-36A Section H.6.0.
- 6.2 Station an operator at Panel 601 at the SLS Control Station. This operator's duty is to terminate SLS injection immediately, if it occurs.
- 6.3 Station an operator at Panel P603 to monitor feedwater. This operator will monitor and control reactor water level as necessary.
- 6.4 Station personnel in the Relay Room at the RRCS panel being reenergized. Establish direct communication via headsets with the operator at Panel P603 and the RRCS panel being reenergized.
- 6.5
  - a. Reenergize Division I of the RRCS (logic power only) as follows:
  - b. At center bay in back of Panel C22-P001, place switches S1A and S2A on lower power supply board to ON.
  - c. Place switches S1A and S2A on upper power supply board to ON.
  - d. If any RRCS functions were initiated, immediately place switches S1A and S2A on upper and lower power supply boards to OFF, notify the CSO and SSS, and take appropriate corrective actions.



6.5 (Cont)

- e. If no RRCS functions were initiated, carefully replace fuse F267 (also labeled F5A) and F268 (also labeled F6A) to restore the ARI function. The system is reenergized.
- f. If an ARI function initiates when fuses are replaced, leave fuses in and take action as directed by SSS.
- g. Document Division I RRCS reenergization in the SSS Log.

6.6

- a. Reenergize Division II of the RRCS (logic power only) as follows:
  - b. At center bay in back of Panel C22-P002, place switches S1A and S2A on lower power supply board to ON.
  - c. Place switches S1A and S2A on upper power supply board to ON.
  - d. If any RRCS functions were initiated, immediately place switches S1A and S2A on upper and lower power supply boards to OFF, notify the CSO and SSS, and take appropriate corrective actions.
  - e. If no RRCS functions were initiated, carefully replace fuse F267 (also labeled F5B) and fuse F268 (also labeled F6B) to restore the ARI function. The system is now reenergized.
  - f. If an ARI function initiates when fuses are replaced, leave fuses in and take action as directed by the SSS.
  - g. Document Division II RRCS reenergization in the SSS Log.

7.0 RRCS Feedwater Runback Disable

7.1 Place RRCS FW Auto Runback Disabled Switch in the "ON" position. Verify that the following occurs:

- a. No feedwater runback occurs.
- b. Annunciator window 603430 is in alarm.
- c. Computer point RRBC17 is in alarm.
- d. RRCS Feedwater Runback Bypassed light is illuminated.

7.2 Place RRCS FW Auto Runback Disabled Switch in the "OFF" position, verify that the following occurs:

- a. Annunciator window 603430 is clear.
- b. Computer point RRBC17 is clear.
- c. RRCS Feedwater Runback Bypassed light is extinguished.

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8.0 Re-Establishment of Self-Test on an Operable Division of RRCS with a "Test Fault" on the Opposite Division

**NOTE:** A "Test Fault" on either division of RRCS terminates the "Self Test" functions on both divisions. If a subsequent fault occurred on the operable division no alarms will be generated. To re-establish "Self Test" on the operable division, perform the following steps.

**CAUTION:**

IN RARE CIRCUMSTANCES THE FAULT MAY INDICATE THAT THE OPPOSITE PANEL IS NOT OPERATING PROPERLY REFER TO SECTION I.9.3.

8.1 Gain access to the technician keyboard and display using the RRCS panel key (key 17), for the operable division.

8.2 Press the ON/OFF key on the top keyboard.

8.3 Press the STS key. The display should now show the following:

1=INTERDIV      2=CARD      3=SYSTEM  
4=SELF TEST      5=OTHER

8.4 Press 5 on the lower keyboard. The display should now show the following:

1=STATUS      2=GET DATA  
3=RESET ATM

8.5 Press 1 on the lower keyboard. The display should now show the following:

(Note that the following may vary slightly depending on the state the machine was in at the time the fault came in.)

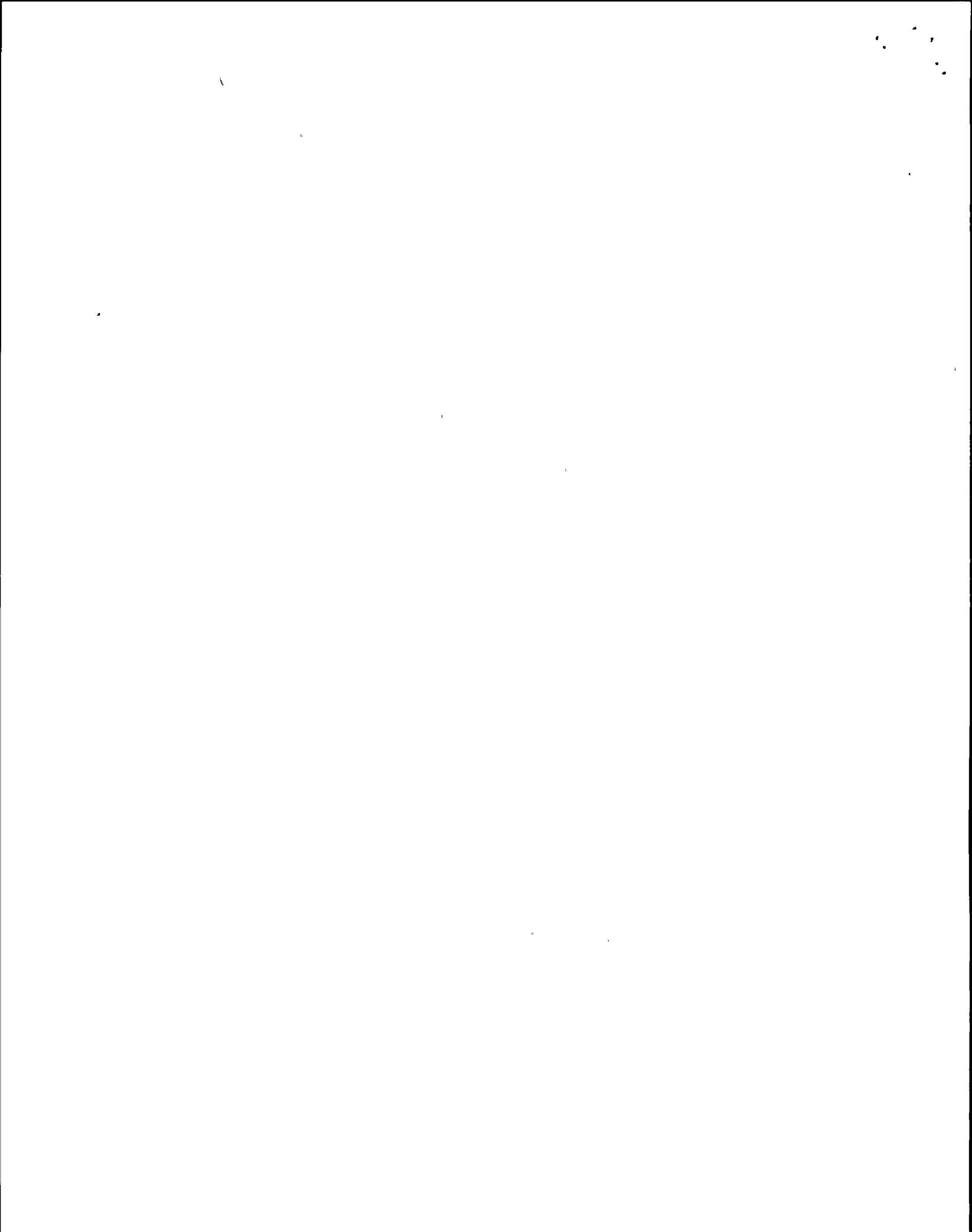
CONFIG:      SLAVE      OFF-LINE 1.UP2.UP  
CYCLE CNTR=13,123

8.6 Press the cur key on the lower keyboard.

8.7 Press the cur key on the lower keyboard. The display should show the following:

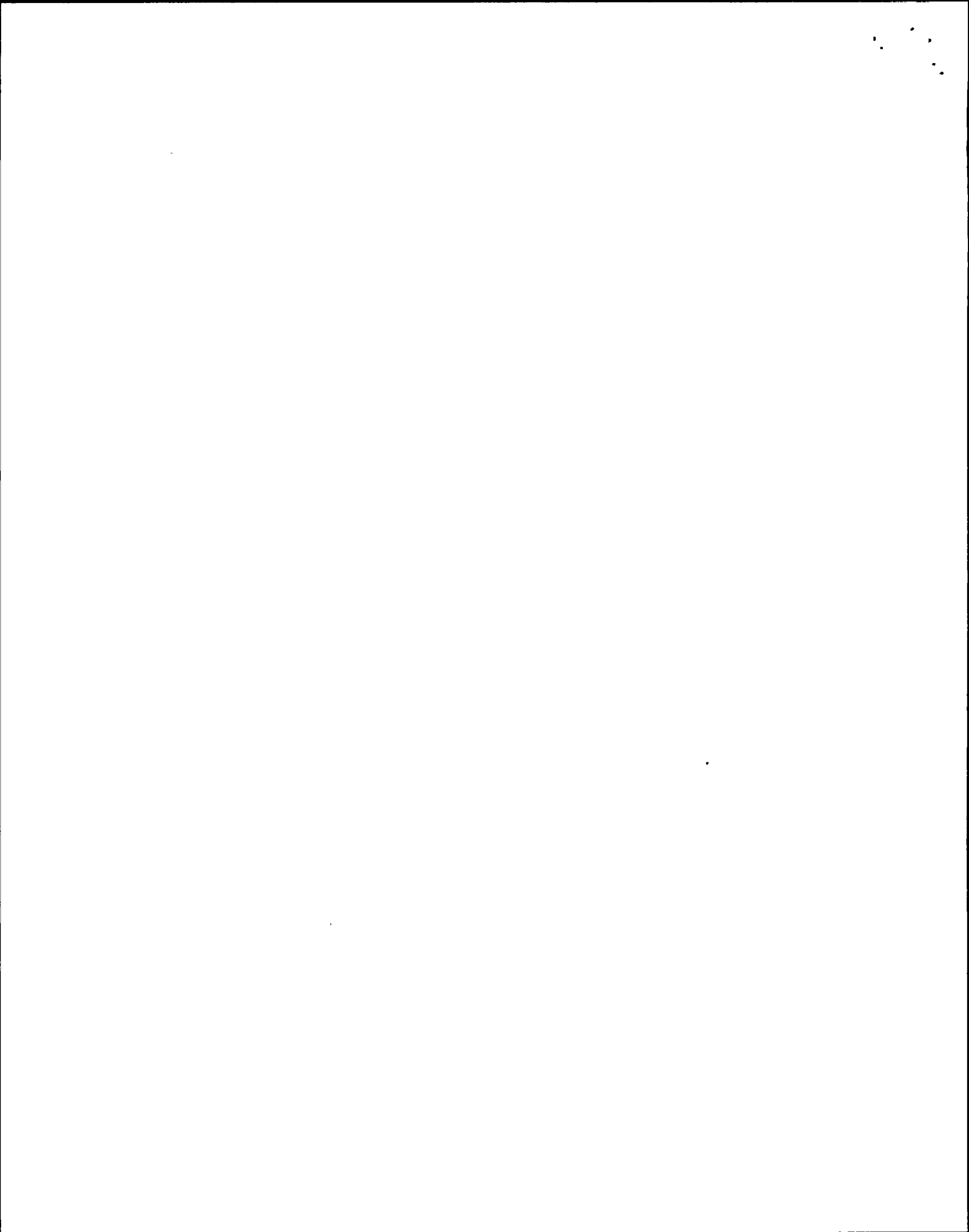
1=MASTER      2=SLAVE      3=ONLINE      4=OFFLINE  
5=UP OD      6=DN OD      7=AUTO START

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8.13 Press the ON/OFF key on the top keyboard.

CAUTION:

IF EITHER OF THE NEXT STEPS FAILS TO OCCUR, NOTIFY THE I&C DEPARTMENT IMMEDIATELY.

8.14 Verify that the test fault light on the RRCS panel is clear for the Operable Division.

8.15 Wait approximately five (5) minutes, verify that the test fault does not come in or return.

8.16 If the test fault comes in, notify I&C Department immediately.

8.17 Notify I&C to restore self-test once inoperable division is repaired.

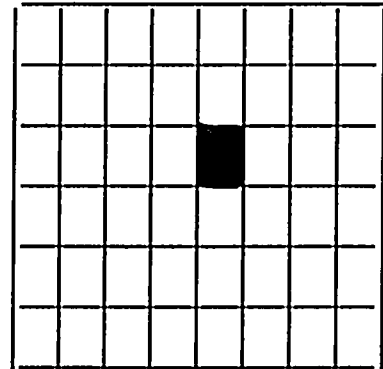
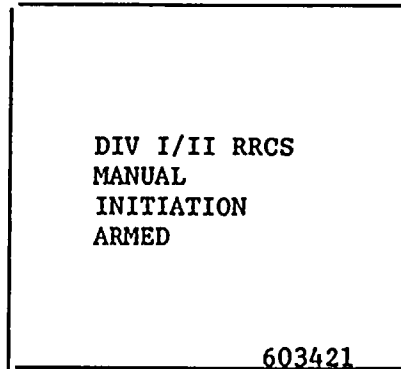
TCN-17.

11

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

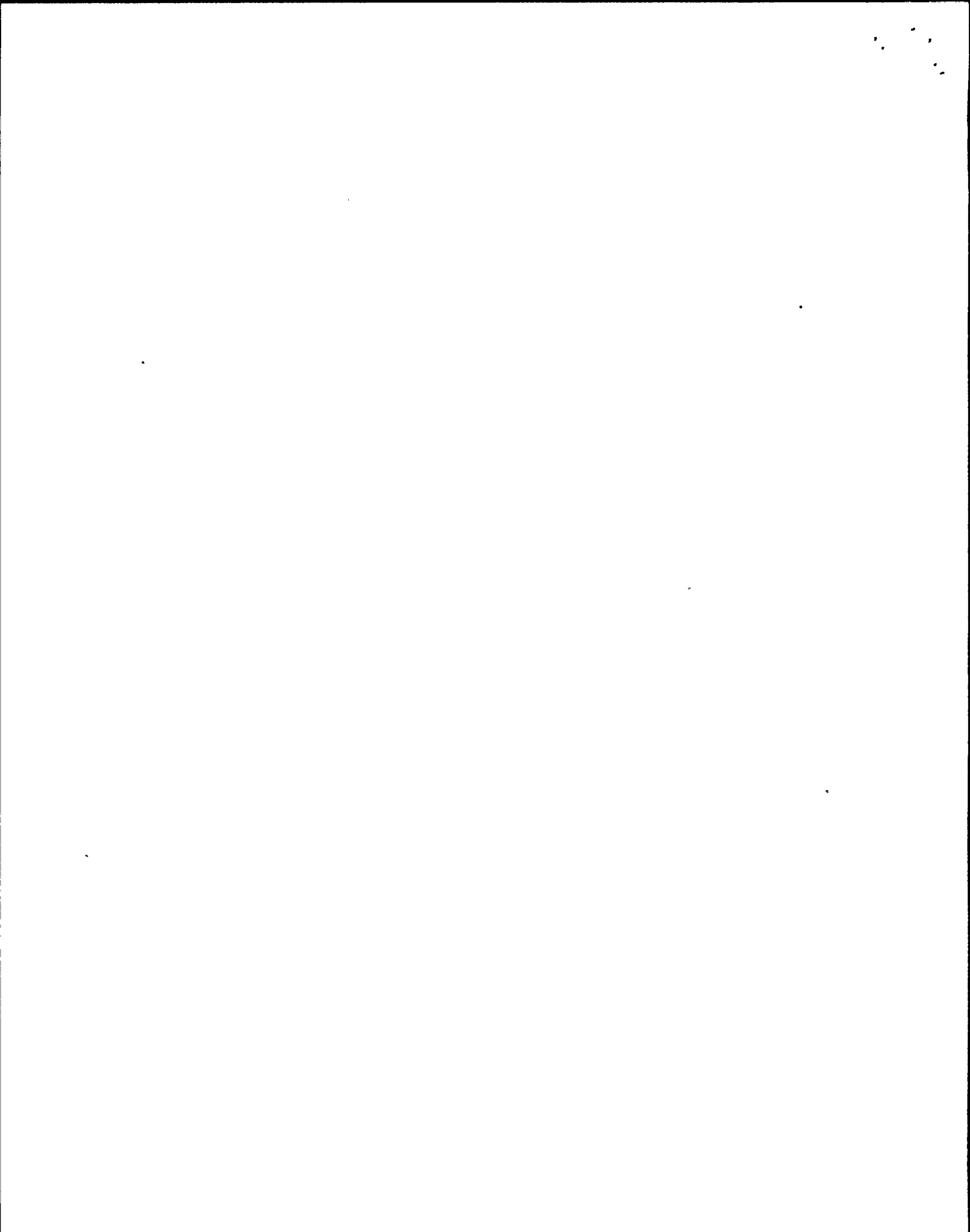
1.0 603421 Division I/II RRCS Manual Initiation Armed

Refresh: Yes



603421

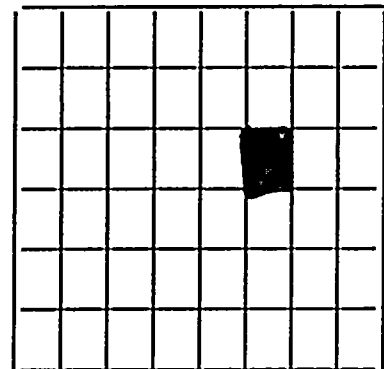
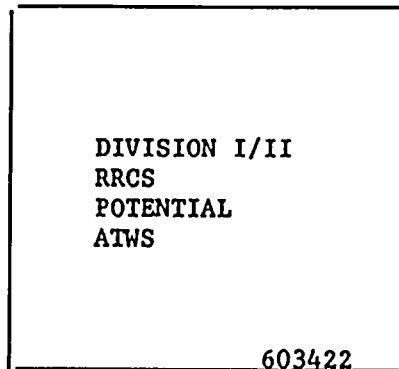
- | 1.1 | <u>Computer Point</u>   | <u>Computer Printout</u>     | <u>Source</u>  |
|-----|---|------------------------------|--|
| a.  | RRSBC01   | DIV 1 RRCS MAN<br>INIT ARMED | One or both Division I<br>RRCS Manual Initiation<br>switch collars rotated<br>to ARMED.  |
| b.  | RRSBC02   | DIV 2 RRCS MAN<br>INIT ARMED | One or both Division II<br>RRCS Manual Initiation<br>switch collars rotated<br>to ARMED. |
| 1.2 | <u>Automatic Response</u>   |                              |  |
|     | NONE  |                              |  |
| 1.3 | <u>Corrective Action</u>  |                              |  |
| a.  | Restore Division I and II RRCS Manual Initiation switch collars to DISARMED, as required. |                              |  |



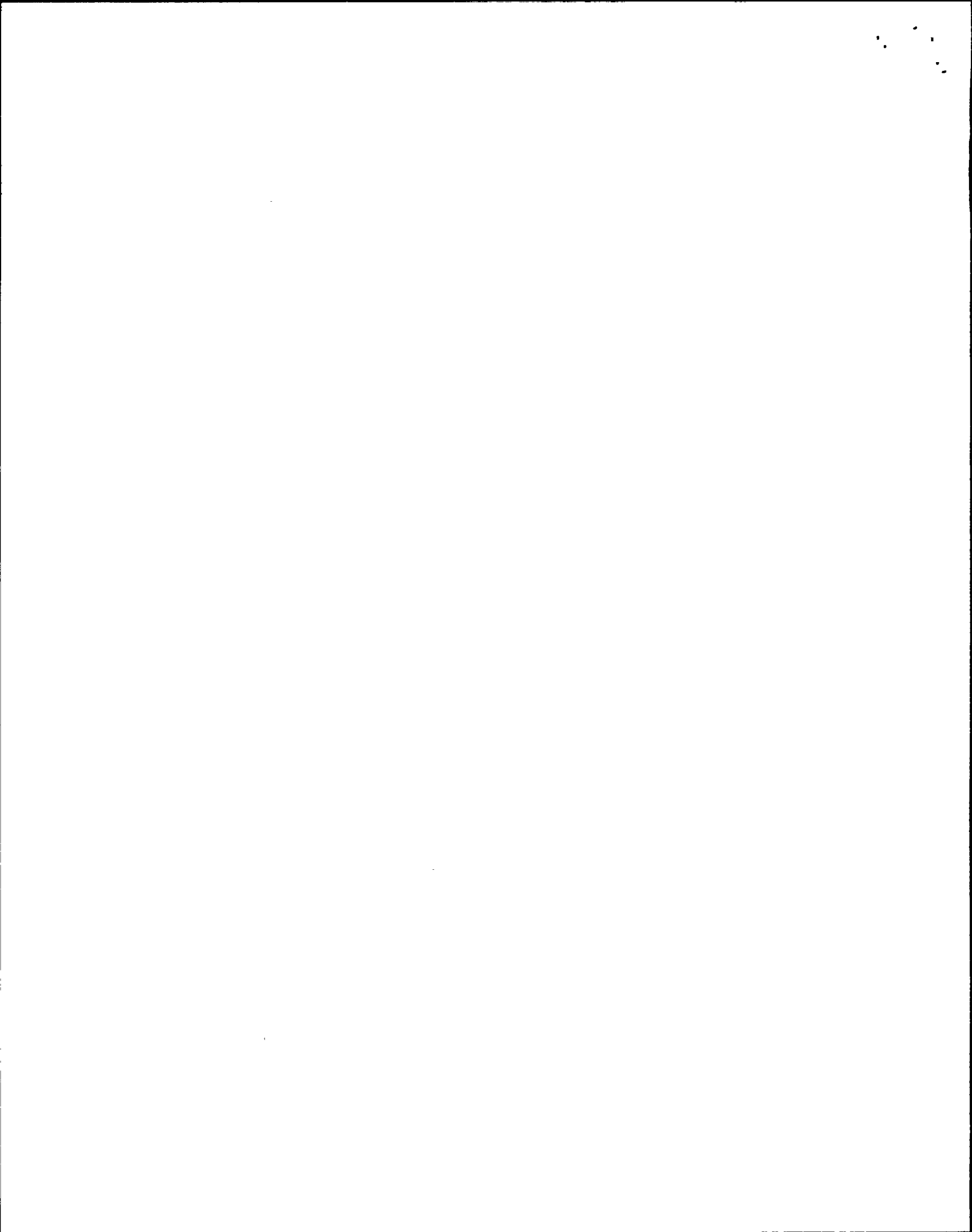
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

2.0 603422 Division I/II Redundant Reactivity Control System  
Potential Anticipated Transient Without Scram

Refresh: Yes



2.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSBC03	DIV 1 RRCS POTENTIAL ATWS	<ol style="list-style-type: none"> <li>1. RPV level less than 108.8 inches (level 2)</li> <li>2. RPV pressure greater than 1050 psig</li> <li>3. One or both Division I RRCS Manual Initiation switches armed and depressed.</li> </ol>
b.	RRSBC04	DIV 2 RRCS POTENTIAL ATWS	<ol style="list-style-type: none"> <li>1. RPV level less than 108.8 inches (level 2)</li> <li>2. RPV pressure greater than 1050 psig</li> <li>3. One or both Division II RRCS Manual Initiation switches armed and depressed.</li> </ol>



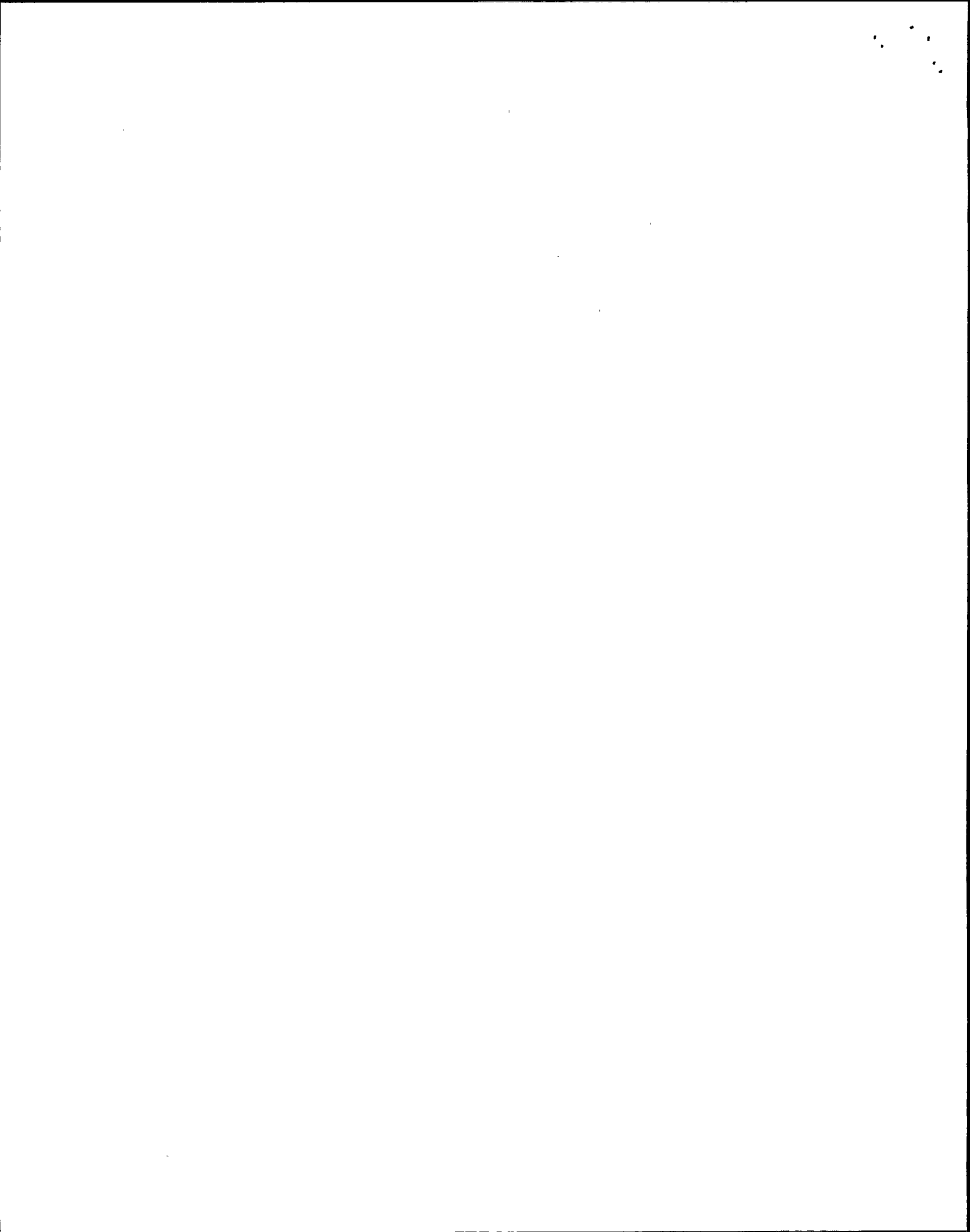


2.2 Automatic Response

- a. If both subchannels of Division I or II energize, the following occurs:
  - 1. Alternate Rod Insertion initiates.
  - 2. After a 98 second time delay concurrent with APRMS not downscale or INOP, the following occurs:
    - a. Reactor Water Cleanup System isolates.
    - b. Standby Liquid Control System initiates.

2.3 Corrective Action

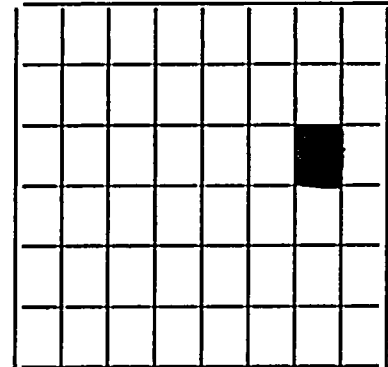
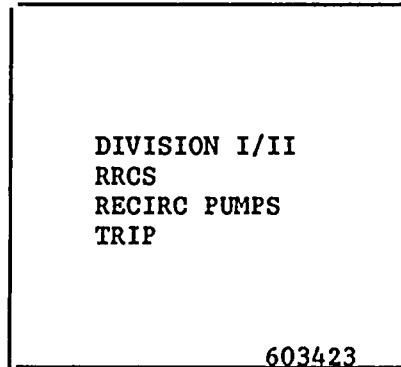
- a. Verify RRCS initiation per Section H of this procedure, if required.
- b. Refer to N2-EOP's.



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

3.0 603423 Division I/II Redundant Reactivity Control System  
Recirculation Pumps Trip

Refresh: Yes \_\_\_\_\_



3.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSUC01	DIV 1 RRCS RECIRC PMP TR	<ol style="list-style-type: none"> <li>1. RPV level less than 108.8 inches (level 2). As sensed by 2ISC*LT8A or B.</li> <li>2. RPV pressure greater than 1050 psig. As sensed by 2ISC*PT2A or B.</li> </ol>
b.	RRSUC02	DIV 2 RRCS RECIRC PMP TR	<ol style="list-style-type: none"> <li>1. RPV level less than 108.8 inches (Level 2). As sensed by 2ISC*LT8C or D.</li> <li>2. RPV pressure greater than 1050 psig. As sensed by 2ISC*PT2C or D.</li> </ol>

3.2 Automatic Response

- a. If both pressure transmitters in Division I or II sense high pressure, the following occurs:
  1. Reactor Recirculation Pumps transfer to LFMG.
  2. Alternate Rod Insertion initiates.

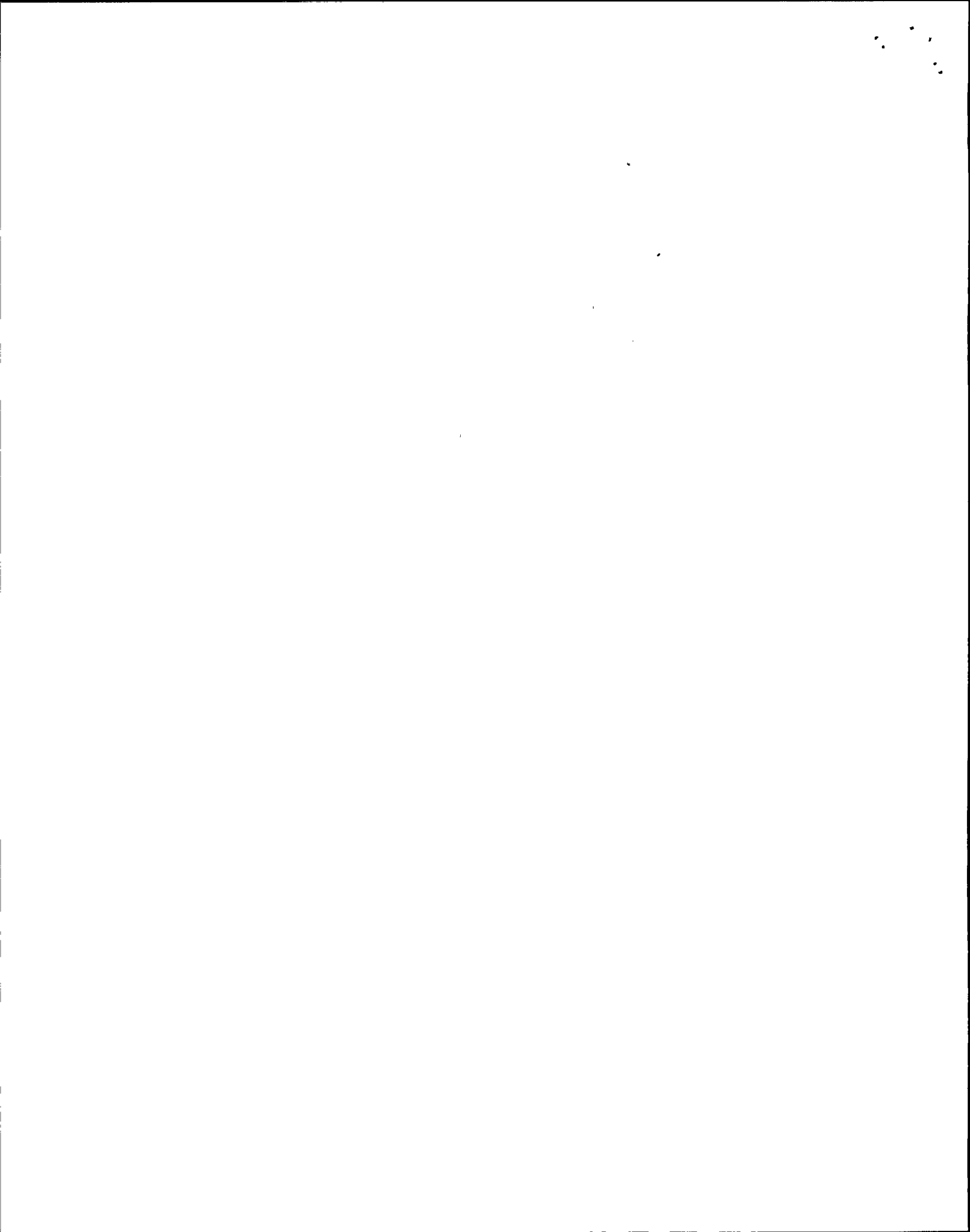
11

3. After a 25 second time delay concurrent with APRM's not downscale or INOP, the following occurs:
  - a. Reactor Recirculation Pumps LFMG power supply trips.
  - b. Feedwater runback initiates and feedwater min flow valves fail open. (Sealed in for 25 seconds).
4. After a 98 second time delay concurrent with APRM's not downscale or INOP, the following occurs:
  - a. Reactor Water Cleanup System isolates.
  - b. Standby Liquid Control System initiates.
- b. If both level transmitters in Division I or II sense low level, the following occurs:
  1. Reactor Recirculation Pumps trip.
  2. After a 98 second time delay concurrent with APRM's not downscale or INOP, the following occurs:
    - a. Reactor Water Cleanup System isolates.
    - b. Standby Liquid Control System initiates.

3.3

Corrective Action

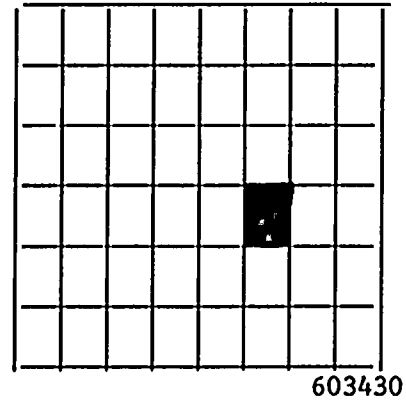
- a. Verify automatic response occurs.
- b. Verify RRCS initiation per Section H of this procedure.
- c. Refer to N2-EOP's.



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

4.0 603430 RRCS FW Auto Init Runback Disabled.

Refresh: No



- | 4.1 | <u>Computer Point</u> | <u>Computer Printout</u>   | <u>Source</u>   |
|-----|-----------------------|----------------------------|---|
| a.  | RRSBC17               | RRCS FW AUTO RUNB<br>DSABL | RRCS FW Auto Init Runback<br>Disabled switch placed in<br>the "ON" position |
- 4.2 Automatic Response
- a. If RRCS FW Auto Init Runback Disabled switch is placed in the "ON" position, no feedwater system runback will occur.
  - b. RRCS Feedwater Runback Bypassed Light on 2CEC\*PNL603 will be lit.
- 4.3 Corrective Action
- a. Verify automatic response occurs.

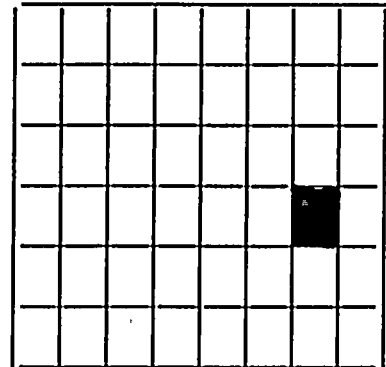
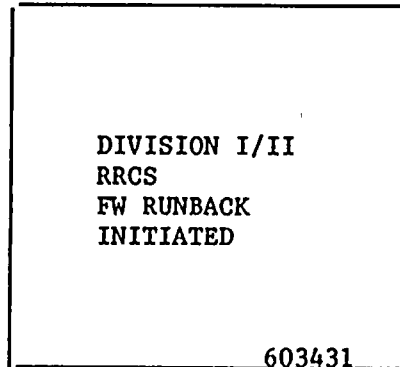
11



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

5.0 603431 Division I/II Redundant Reactivity Control System  
Feedwater Runback Initiated.

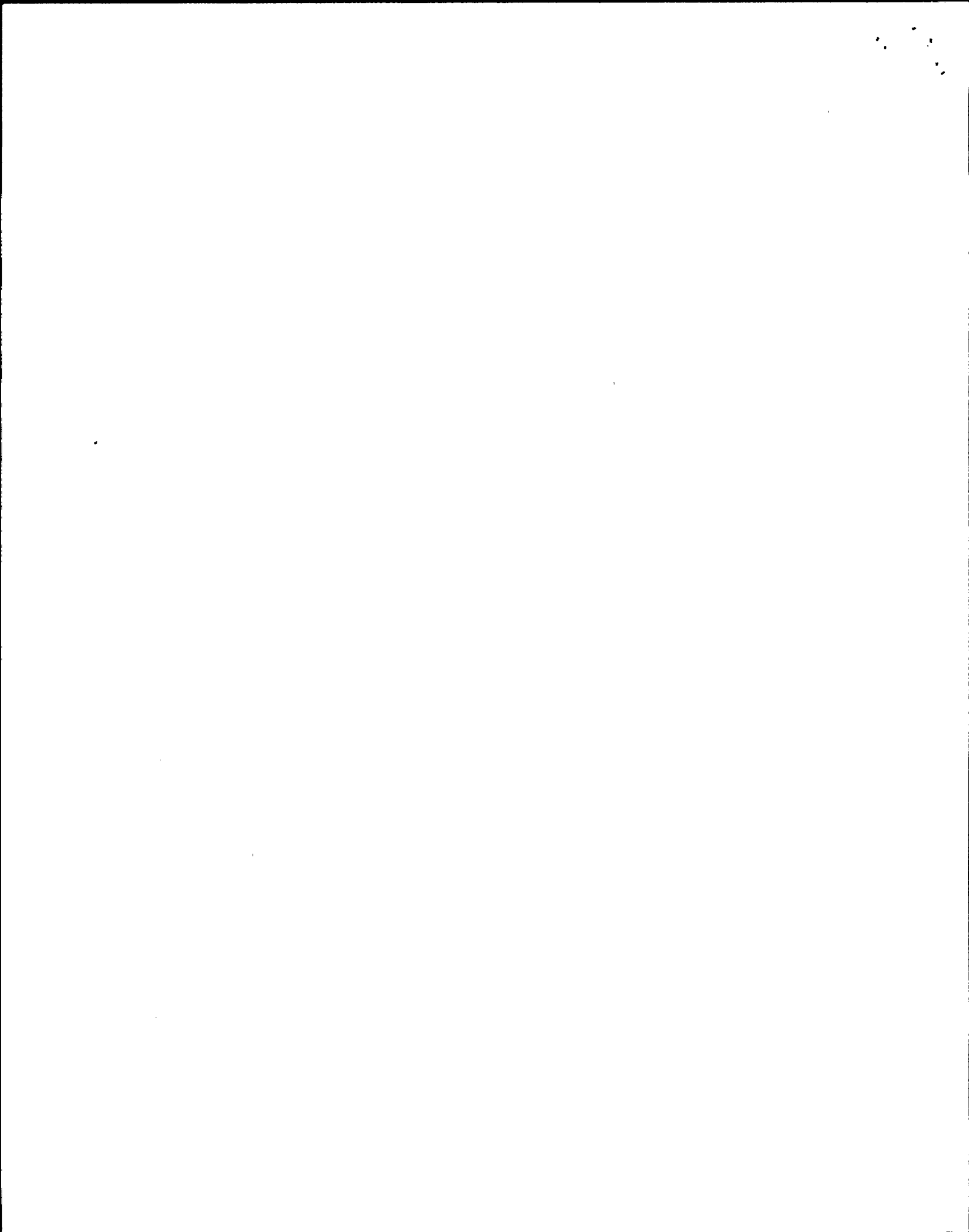
Refresh: Yes



5.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSBC05	DIV 1 RRCS FW RUNBK INIT	1. RPV pressure greater than 1050 psig concurrent with APRM's not downscale (25 second time delay). As sensed by 2ISC*PT2A or B.
b.	RRSBC06	DIV 2 RRCS FW RUNBK INIT	2. RPV pressure greater than 1050 psig concurrent with APRM's not downscale (25 second time delay). As sensed by 2ISC*PT2C or D.

5.2 Automatic Response

- a. If both pressure transmitters in Division I or II sense high pressure, the following occurs:
1. Feedwater System runback initiates and feedwater min flow valves fail open. (Sealed in for 25 seconds).
  2. Reactor Recirculation Pumps LFMG power supply trips.

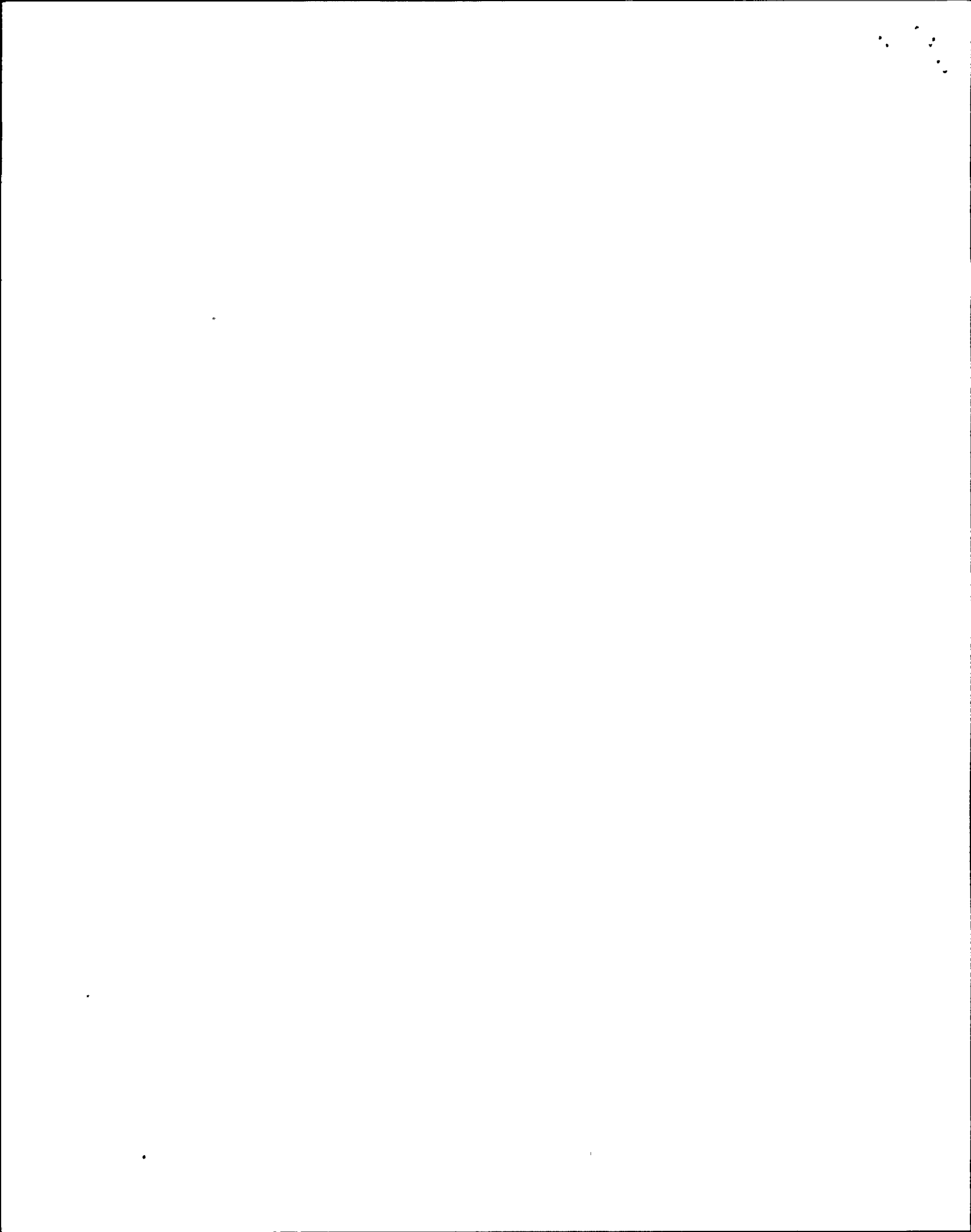


3. After a 73 second time delay concurrent with APRM's not  
downscale or INOP, the following occurs:

- a. Reactor Water Cleanup System isolates.
- b. Standby Liquid Control System initiates.

5.3 Corrective Action

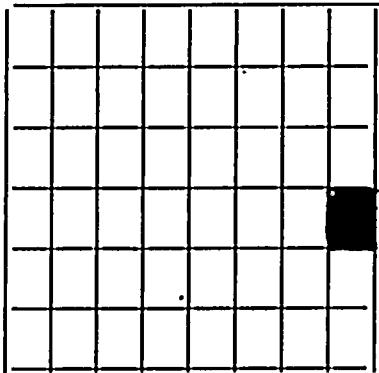
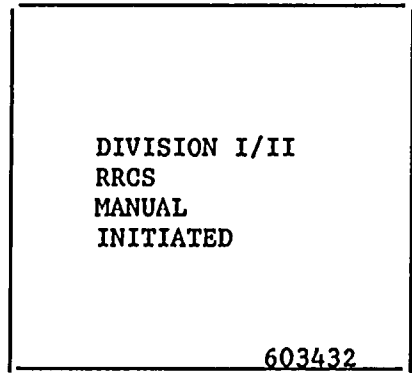
- a. Verify automatic response occurs.
- b. Verify RRCS initiation per Section H as required.
- c. Refer to N2-EOP's.



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

6.0        603432    Division I/II Redundant Reactivity Control System  
Manual Initiated

Refresh: Yes \_\_\_\_\_



- | 6.1 | <u>Computer Point</u> | <u>Computer Printout</u>   | <u>Source</u>  |
|-----|-----------------------|----------------------------|--|
| a.  | RRSBC13               | DIV1 RRCS MAN<br>INITIATED | Division I RRCS Manual<br>Initiation switches<br>armed and depressed.  |
| b.  | RRSBC14               | DIV2 RRCS MAN<br>INITIATED | Division II RRCS Manual<br>Initiation switches<br>armed and depressed. |
- 6.2        Automatic Response
- a.    If both Division I or II RRCS Manual Initiation switches are armed and depressed, RRCS initiates.
- 6.3        Corrective Action
- a.    Verify RRCS initiation per Section H of this procedure.
- b.    Refer to N2-EOP's.

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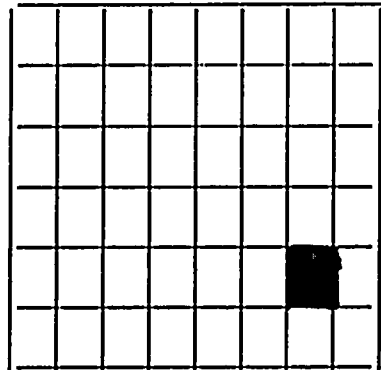
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

7.0      603439      Division I/II Redundant Reactivity Control System  
Confirmed Anticipated Transient Without Scram

Refresh: Yes \_\_\_\_\_

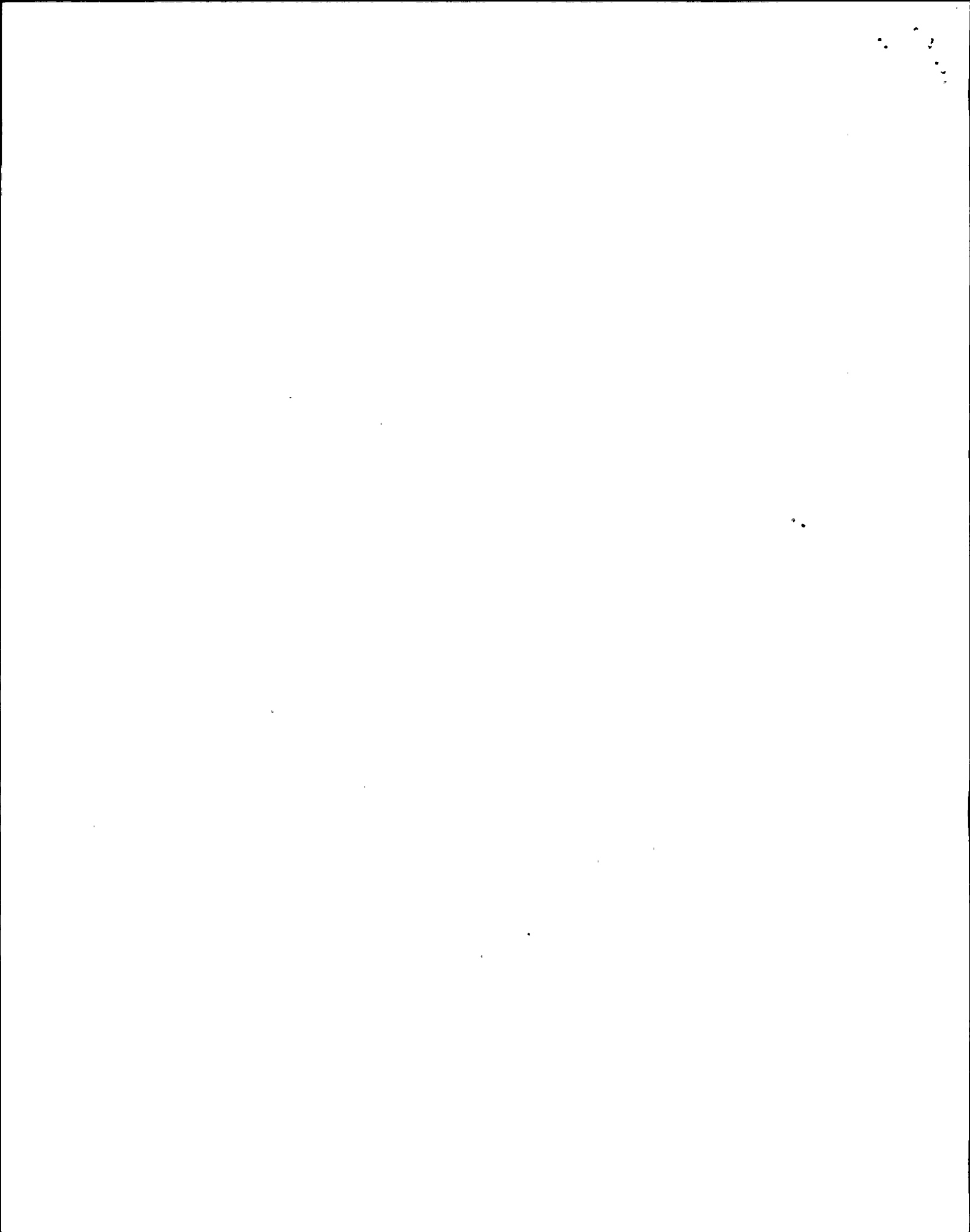
DIVISION I/II  
RRCS  
CONFIRMED  
ATWS

603439



603439

7.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSBC09	DIV 1 RRCS CONFIRMED ATWS	<p>One or more of the following conditions exist concurrent with APRM's not downscale or INOP</p> <ol style="list-style-type: none"> <li>1. RPV water level less than 108.8 inches (Level 2). As sensed by 2ISC*LT8A or B.</li> <li>2. RRCS pressure greater than 1050 psig as sensed by 2ISC*PT2A or B</li> <li>3. One or both Division I RRCS Manual Initiation switches armed and depressed</li> </ol>





7.1  
(Cont.)

Computer Point

Computer Printout

Source

b. RRSBC10

DIV 2 RRCS  
CONFIRMED ATWS

One or more of  
the following  
conditions exist  
concurrent with  
APRM not downscale  
or INOP

1. RPV water level less than 108.8 inches (level 2). As sensed by 2ISC\*LT8C or D.
2. RPV pressure greater than 1050 psig. As sensed by 2ISC\*PT2C or D
3. One or both Division II RRCS Manual Initiation switches armed and depressed.

7.2

Automatic Response

- a. If both subchannels of Division I or II are energized, RRCS initiates.

7.3

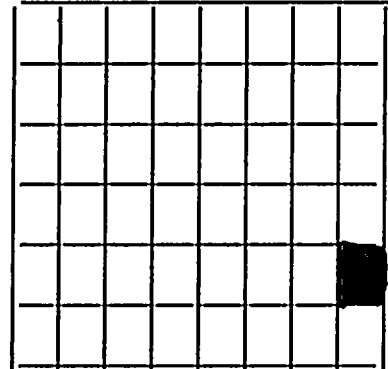
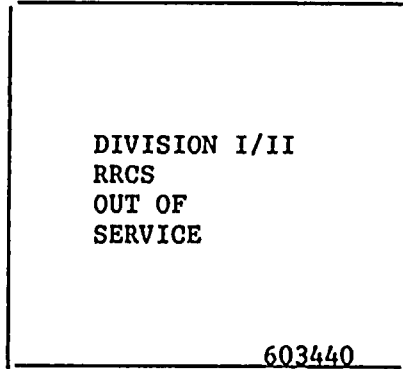
Corrective Action

- a. Verify RRCS initiation per Section H of this procedure.
- b. Refer to N2-EOP's.



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

8.0 603440 Division I/II Redundant Reactivity Control System Out of Service



Refresh: Yes

8.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSBC11	DIV 1 RRCS OUT OF SERVICE	1. Standby Liquid Storage Tank level less than 0 gallons. As sensed by 2SLS*LT6A or C  2. Loss of 125 VDC power supply to Channel A or B logic
b.	RRSBC12	DIV 2 RRCS OUT OF SERVICE	1. Standby Liquid Storage Tank Level less than 0 gallons. As sensed by 2SLS*LT6B or D.  2. Loss of 125 VDC power supply to Channel A or B logic

8.2 Automatic Response

a. If both level transmitters in Division I(II) sense low Storage Tank level, Standby Liquid Pump 1A(B) trips.

8.3 Corrective Action

**NOTE:** Refer to Technical Specifications 3.3.4.1 (ATWS-RPT); 3.1.5 (SLS).

a. For a SLC Storage Tank low level, refer to N2-OP-36A.

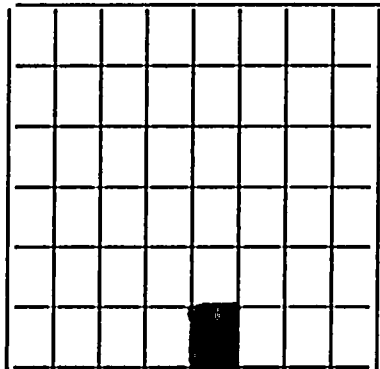
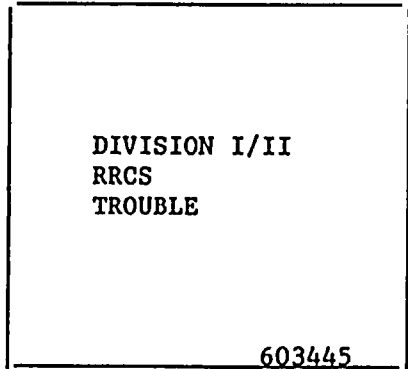
b. Verify power supply lineup per Table II of this procedure.  
N2-OP-36B -20 January 1991



I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

9.0 603445 Division I/II Redundant Reactivity Control System  
Trouble

Refresh: No



9.1	<u>Computer Point</u>	<u>Computer Printout</u>	<u>Source</u>
a.	RRSBC07(08)	DIV 1(2) RRCS TROUBLE	<ol style="list-style-type: none"> <li>1. RRCS Manual Initiation Switch Armed</li> <li>2. RRCS Manual Initiation</li> <li>3. RPV High Pressure</li> <li>4. RPV Low Water Level</li> <li>5. RRCS Potential ATWS</li> <li>6. RRCS ARI initiated</li> <li>7. RRCS LFMG Transferred</li> <li>8. RRCS Recirculation Pumps tripped</li> <li>9. RRCS FW Runback initiated</li> <li>10. RRCS RWCU isolated</li> <li>11. RRCS confirmed ATWS</li> <li>12. RRCS Test Fault</li> <li>13. RRCS logic in Calib. or gross failure.</li> </ol>



9.2 Automatic Response

- a. RRCS initiation may be in progress.

9.3 Corrective Action

- a. Verify initiating condition at local panel C22-P001 or P002, by amber light indication.
- b. Refer to associated window alarm response per this procedure, if applicable.
- c. Verify RRCS initiation per Section H of this procedure, if applicable.
- d. Verify RRCS logic not in Test or being calibrated.
- e. If annunciator was initiated by a "Test Fault" notify the SSS and perform the following:

- 1. Gain access to the technician keyboard and display using the RRCS Panel key (key 17), for the division with the "Test Fault".
- 2. Press the ON/OFF key on the top keyboard.
- 3. Press the STS key. The display should now show the following:

1=INTERDIV      2=CARD      3=SYSTEM  
4=SELF TEST    5=OTHER

- 4. Press 5 on the lower keyboard. The display should now show the following:

1=STATUS    2=GET DATA  
3=RESET AIM

- 5. Press 1 on the lower keyboard. The display should now show the following:

(Note that the following may vary slightly depending on the state the machine was in at the time the fault came in.)

CONFIG: MASTER      OFF-LINE 1.DN2.DN  
CYCLE CNTR=13,123



- 6. Press the cur key on the lower keyboard.

**NOTE:** Record the information on the current display for review by I&C Department.

TCN-17





9.3 (Cont'd)



7. Press the cur key on the lower keyboard. The display should show the following:

1=MASTER 2=SLAVE 3=ONLINE 4=OFFLINE  
5=UP OD 6=DN OD 7=AUTO START

8. Press the 7 key on the lower keyboard. The display should now return to the display shown in Step 5.
9. Press the ON/OFF key on the top keyboard.

CAUTION:

IF EITHER OF THE NEXT STEPS FAILS TO OCCUR, NOTIFY THE I&C DEPARTMENT IMMEDIATELY.

10. Verify that the test fault light on the RRCS panel has cleared.
11. Wait approximately five (5) minutes, verify that the test fault does no return.
12. If the test fault does not clear, refer to Section H.8.0 to re-establish the self-test function on the operable division. | TCN-17.

10-1-1



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TABLE II  
SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number - Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE .	REMARKS
C22-P001	RRS Div. 1/Ch.A 120VAC	2VBS*PNL 101A Ckt #20	On			
C22-P001	RRS Div. 1/Ch.A 125VDC	2BYS*PNL 202A Ckt #1	On			
C22-P001	RRS Div. 1/Ch.B 125VDC	2BYS*PNL 202A Ckt #2	On			
C22-P002	RRS Div. 2/Ch.A 120VAC	2VBS*PNL 301B Ckt #17	On			
C22-P002	RRS Div. 2/Ch.A 125VDC	2BYS*PNL 202B Ckt #1	On			
C22-P002	RRS Div. 2/Ch.B 125VDC	2BYS*PNL 202B Ckt #2	On			

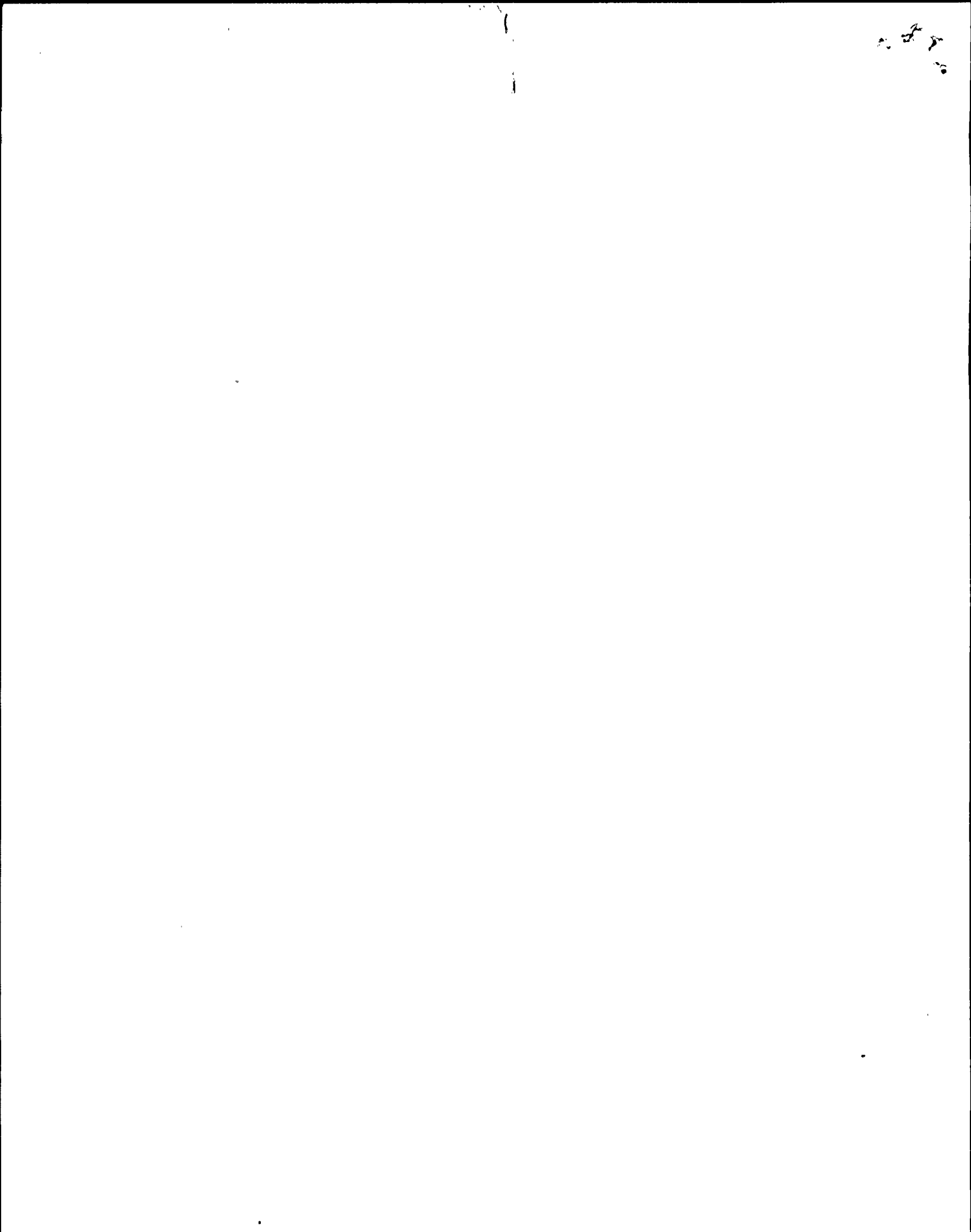


TABLE III  
SWITCH LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number - Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
C33A-S6	RRCS FW AUTO INIT RUNBACK DISABLE		Off			

