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JOSEPH A. WIDAY  
VICE PRESIDENT & PLANT MANAGER  
GINNA STATION

September 14, 2001

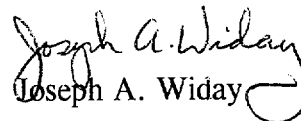
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Attn: Robert Clark  
Project Directorate I  
Washington, D.C. 20555

Subject: Emergency Operating Procedures  
R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

Dear Mr. Clark:

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,

  
Joseph A. Widay

JAW/jdw

xc: U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

Ginna USNRC Senior Resident Inspector

Enclosure(s):

AP Index  
ATT Index  
AP-CCW.2, Rev 15  
AP-CCW.3, Rev 13  
AP-RCC.2, Rev 9  
AP-RHR.1, Rev 16  
AP-RHR.2, Rev 10  
ATT-15.0, Rev 8

*Handwritten:* A1045

REPORT NO. 01  
REPORT: NPSP0200  
DOC TYPE: PRAP

GINNA NUCLEAR POWER PLANT  
PROCEDURES INDEX  
ABNORMAL PROCEDURE

09/14/01 PAGE: 1

PARAMETERS: DOC TYPES - PRAP PRAR PRATT PRER PRPT STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-CCW.1	LEAKAGE INTO THE COMPONENT COOLING LOOP	014	01/09/01	05/01/98	05/01/03	EF
AP-CCW.2	LOSS OF CCW DURING POWER OPERATION	015	09/14/01	08/17/99	08/17/04	EF
AP-CCW.3	LOSS OF CCW - PLANT SHUTDOWN	013	09/14/01	08/17/99	08/17/04	EF
AP-CR.1	CONTROL ROOM INACCESSIBILITY	017	05/11/01	01/11/00	01/11/05	EF
AP-CVCS.1	CVCS LEAK	012	05/01/98	05/01/98	05/01/03	EF
AP-CVCS.3	LOSS OF ALL CHARGING FLOW	002	02/11/00	02/26/99	02/26/04	EF
AP-CW.1	LOSS OF A CIRC WATER PUMP	010	07/16/98	05/01/98	05/01/03	EF
AP-ELEC.1	LOSS OF 12A AND/OR 12B BUSES	021	08/30/01	05/01/98	05/01/03	EF
AP-ELEC.2	SAFEGUARD BUSES LOW VOLTAGE OR SYSTEM LOW FREQUENCY	009	03/22/99	03/22/99	03/22/04	EF
AP-ELEC.3	LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350 F)	009	08/30/01	05/01/98	05/01/03	EF
AP-ELEC.14/16	LOSS OF SAFEGUARDS BUS 14/16	003	03/15/01	06/09/97	06/09/02	EF
AP-ELEC.17/18	LOSS OF SAFEGUARDS BUS 17/18	002	10/18/99	06/09/97	06/09/02	EF
AP-FW.1	PARTIAL OR COMPLETE LOSS OF MAIN FEEDWATER	012	02/11/00	02/27/98	02/27/03	EF
AP-IA.1	LOSS OF INSTRUMENT AIR	017	12/02/99	05/01/98	05/01/03	EF
AP-PRZR.1	ABNORMAL PRESSURIZER PRESSURE	012	03/26/01	12/02/99	12/02/04	EF
AP-RCC.1	CONTINUOUS CONTROL ROD WITHDRAWAL/INSERTION	007	05/22/01	05/14/98	05/14/03	EF
AP-RCC.2	RCC/RPI MALFUNCTION	009	09/14/01	02/06/97	02/06/02	EF
AP-RCC.3	DROPPED ROD RECOVERY	004	11/16/98	02/27/98	02/27/03	EF
AP-RCP.1	RCP SEAL MALFUNCTION	013	06/09/00	05/01/98	05/01/03	EF
AP-RCS.1	REACTOR COOLANT LEAK	015	09/08/00	05/01/98	05/01/03	EF
AP-RCS.2	LOSS OF REACTOR COOLANT FLOW	010	12/14/98	05/01/98	05/01/03	EF
AP-RCS.3	HIGH REACTOR COOLANT ACTIVITY	008	06/14/01	08/05/97	08/05/02	EF
AP-RCS.4	SHUTDOWN LOCA	011	12/02/99	05/01/98	05/01/03	EF
AP-RHR.1	LOSS OF RHR	016	09/14/01	05/01/98	05/01/03	EF

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REPORT NO. 01  
REPORT: NPSPO200  
DOC TYPE: PRAP

GINNA NUCLEAR POWER PLANT  
PROCEDURES INDEX  
ABNORMAL PROCEDURE

09/14/01 PAGE: 2

PARAMETERS: DOC TYPES - PRAP PRAR PRATT PRER PRPT STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-RHR.2	LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	010	09/14/01	03/31/00	03/31/05	EF
AP-SG.1	STEAM GENERATOR TUBE LEAK	001	07/18/01	09/08/00	09/08/05	EF
AP-SW.1	SERVICE WATER LEAK	015	10/18/99	06/03/98	06/03/03	EF
AP-TURB.1	TURBINE TRIP WITHOUT RX TRIP REQUIRED	010	02/12/99	10/10/97	10/10/02	EF
AP-TURB.2	TURBINE LOAD REJECTION	017	02/11/00	05/13/98	05/13/03	EF
AP-TURB.3	TURBINE VIBRATION	010	02/11/00	02/10/98	02/10/03	EF
AP-TURB.4	LOSS OF CONDENSER VACUUM	014	05/01/98	05/01/98	05/01/03	EF
AP-TURB.5	RAPID LOAD REDUCTION	005	06/09/00	06/09/00	06/09/05	EF
TOTAL FOR PRAP	32					

REPORT NO. 01  
REPORT: NPS0200  
DOC TYPE: PRATT

GINNA NUCLEAR POWER PLANT  
PROCEDURES INDEX  
EOP ATTACHMENTS

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PARAMETERS: DOC TYPES - PRAP PRAR PRATT PRER PRPT STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-1.0	ATTACHMENT AT POWER CCW ALIGNMENT	001	07/26/94	02/10/98	02/10/03	EF
ATT-1.1	ATTACHMENT NORMAL CCW FLOW	000	05/18/00	05/18/00	05/18/05	EF
ATT-2.1	ATTACHMENT MIN SW	005	02/01/01	02/10/98	02/10/03	EF
ATT-2.2	ATTACHMENT SW ISOLATION	006	03/25/99	08/11/98	08/11/03	EF
ATT-2.3	ATTACHMENT SW LOADS IN CNMT	003	01/25/95	12/31/99	12/31/04	EF
ATT-3.0	ATTACHMENT CI/CVI	005	01/25/99	01/06/99	01/06/04	EF
ATT-3.1	ATTACHMENT CNMT CLOSURE	003	01/25/99	01/25/99	01/25/04	EF
ATT-4.0	ATTACHMENT CNMT RECIRC FANS	003	07/26/94	05/13/98	05/13/03	EF
ATT-5.0	ATTACHMENT COND TO S/G	004	01/25/95	12/31/99	12/31/04	EF
ATT-5.1	ATTACHMENT SAFW	006	07/07/98	12/31/99	12/31/04	EF
ATT-5.2	ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP	003	01/14/99	01/14/99	01/14/04	EF
ATT-6.0	ATTACHMENT COND VACUUM	003	12/18/96	02/10/98	02/10/03	EF
ATT-7.0	ATTACHMENT CR EVAC	005	02/11/00	02/10/98	02/10/03	EF
ATT-8.0	ATTACHMENT DC LOADS	006	03/22/99	01/14/99	01/14/04	EF
ATT-8.1	ATTACHMENT D/G STOP	004	11/03/95	02/10/98	02/10/03	EF
ATT-8.2	ATTACHMENT GEN DEGAS	006	08/17/99	08/17/99	08/17/04	EF
ATT-8.3	ATTACHMENT NONVITAL	003	07/26/94	02/10/98	02/10/03	EF
ATT-8.4	ATTACHMENT SI/UV	004	04/24/97	02/10/98	02/10/03	EF
ATT-9.0	ATTACHMENT LETDOWN	007	06/09/00	01/06/99	01/06/04	EF
ATT-9.1	ATTACHMENT EXCESS L/D	003	03/31/00	02/10/98	02/10/03	EF
ATT-10.0	ATTACHMENT FAULTED S/G	005	10/03/96	05/13/98	05/13/03	EF
ATT-11.0	ATTACHMENT IA CONCERNS	002	04/07/97	08/11/98	08/11/03	EF
ATT-11.1	ATTACHMENT IA SUPPLY	002	04/07/97	08/11/98	08/11/03	EF
ATT-11.2	ATTACHMENT DIESEL AIR COMPRESSOR	002	05/11/01	04/03/98	04/03/03	EF

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 REPORT: NPSP0200  
 DOC TYPE: PRATT

GINNA NUCLEAR POWER PLANT  
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 EOP ATTACHMENTS

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PARAMETERS: DOC TYPES - PRAP PRAR PRATT PRER PRPT STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-12.0	ATTACHMENT N2 PORVS	003	03/24/97	02/10/98	02/10/03	EF
ATT-13.0	ATTACHMENT NC	002	07/26/94	02/10/98	02/10/03	EF
ATT-14.0	ATTACHMENT NORMAL RHR COOLING	002	04/07/97	09/23/99	09/23/04	EF
ATT-14.1	ATTACHMENT RHR COOL	004	05/01/98	05/01/98	05/01/03	EF
ATT-14.2	ATTACHMENT RHR ISOL	001	07/26/94	02/10/98	02/10/03	EF
ATT-14.3	ATTACHMENT RHR NPSH	002	08/01/97	01/06/99	01/06/04	EF
ATT-14.4	ATTACHMENT RHR SAMPLE	001	07/26/94	01/06/99	01/06/04	EF
ATT-14.5	ATTACHMENT RHR SYSTEM	002	07/26/94	02/10/98	02/10/03	EF
ATT-14.6	ATTACHMENT RHR PRESS REDUCTION	001	01/14/99	01/14/99	01/14/04	EF
ATT-15.0	ATTACHMENT RCP START	008	09/14/01	03/17/00	03/17/05	EF
ATT-15.1	ATTACHMENT RCP DIAGNOSTICS	003	04/24/97	02/10/98	02/10/03	EF
ATT-15.2	ATTACHMENT SEAL COOLING	004	08/30/01	02/10/98	02/10/03	EF
ATT-16.0	ATTACHMENT RUPTURED S/G	011	07/18/01	01/11/00	01/11/05	EF
ATT-16.1	ATTACHMENT SGTL	001	07/18/01	09/08/00	09/08/05	EF
ATT-16.2	ATTACHMENT RCS BORON FOR SGTL	001	10/13/00	09/08/00	09/08/05	EF
ATT-17.0	ATTACHMENT SD-1	011	01/09/01	02/29/00	02/28/05	EF
ATT-17.1	ATTACHMENT SD-2	005	09/26/96	01/30/01	01/30/06	EF
ATT-18.0	ATTACHMENT SFP - RWST	004	10/08/97	02/10/98	02/10/03	EF
ATT-20.0	ATTACHMENT VENT TIME	003	07/26/94	02/10/98	02/10/03	EF
ATT-21.0	ATTACHMENT RCS ISOLATION	001	07/26/94	02/10/98	02/10/03	EF
ATT-22.0	ATTACHMENT RESTORING FEED FLOW	001	02/12/99	03/24/97	03/24/02	EF
ATT-23.0	ATTACHMENT TRANSFER 4160V LOADS	000	02/26/99	02/26/99	02/26/04	EF
ATT-24.0	ATTACHMENT TRANSFER BATTERY TO TSC	000	09/08/00	09/08/00	09/08/05	EF

TOTAL FOR PRATT


47

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 1 of 9
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

  
\_\_\_\_\_  
RESPONSIBLE MANAGER

9-14-2001  
\_\_\_\_\_  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 2 of 9
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A. PURPOSE - This procedure provides the steps necessary to respond to a loss of CCW while the plant is at power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure may be entered from:

a. AP-CCW.1, LEAKAGE INTO THE COMPONENT COOLING SYSTEM, when CCW surge tank level decrease indicated at power.

2. SYMPTOMS - The symptoms of LOSS OF CCW DURING POWER OPERATION are;

a. Annunciator A-13, CCW SURGE TANK LO LEVEL 41.2%, lit, or

b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSI, lit, or

c. Annunciator A-17, MOTOR OFF RCP CCWP, lit, or

d. Annunciator A-9, RHR PUMP COOLING WATER OUTLET LO FLOW 15 GPM, lit or

e. Annunciator A-6, CONT SPRAY PUMP COOLING WATER OUT LOW FLOW 15 GPM, lit or

f. Annunciator A-14, SAFETY INJ PUMPS COOLING WATER OUT LO FLOW 25 GPM, lit or

g. Annunciator A-7 (A-15), RCP A (B) CCW RETURN HI TEMP OR LO FLOW 165 GPM 125°F, lit or

h. Annunciator A-24 (A-32), RCP A (B) OIL LEVEL + 1.25, lit or,

i. Annunciator A-12, NON-REGEN HX LETDOWN OUT HI TEMP 145°F lit or,

j. Annunciator A-18, VCT HI TEMP 145°.

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 3 of 9
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF CCW FLOW TO A RCP IS INTERRUPTED FOR GREATER THAN 2 MINUTES OR IF EITHER RCP MOTOR BEARING TEMPERATURE EXCEEDS 200°F, THEN TRIP THE AFFECTED RCP.</p> <p>o IF CCW IS LOST, THEN SEAL INJECTION SHOULD BE MAINTAINED TO THE RCP(S) UNTIL RCS TEMPERATURE IS LESS THAN 150°F, OR UNTIL CCW IS RESTORED.</p> <p>*****</p> <p><u>NOTE:</u> If leakage from the CCW system is indicated, then refer to ER-SC.5, HAZARDOUS AND MIXED WASTE MANAGEMENT AND CONTROL, for guidance.</p>		
1	Check CCW Pump Status:	Perform the following:
	<ul style="list-style-type: none"> <li>o Both CCW pump breaker white disagreement lights - EXTINGUISHED</li> <li>o Annunciator A-17, MOTOR OFF RCP CCWP - EXTINGUISHED</li> </ul>	<ul style="list-style-type: none"> <li>a. Ensure standby CCW pump running.</li> <li>b. <u>IF</u> annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSI, lit, <u>THEN</u> check closed CCW to RHR HXs (MOV-738A and MOV-738B).</li> </ul>



EOP:

AP-CCW.2

TITLE:

LOSS OF CCW DURING POWER OPERATION

REV: 15

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: CCW surge tank level should be verified locally in the AUX BLDG, if possible.

2 Verify CCW Surge Tank Level -  
APPROXIMATELY 50% AND STABLE

Perform the following:

- a. Open RMW to CCW surge tank, MOV-823.
- b. Start RMW pump(s).
- c. IF surge tank level stable or increasing, THEN go to Step 3.

IF CCW surge tank level can NOT be maintained greater than 10%, THEN perform the following:

- 1) Trip the reactor.
- 2) Trip the RCPs.
- 3) Place both CCW pumps in pull stop.
- 4) Go to E-0, REACTOR TRIP OR SAFETY INJECTION.

3 Check CCW To Both RCPs:

- o Annunciator A-7 (A-15), RCP 1A (1B) CCW return Hi temp or low flow 165 gpm 125°F alarm - EXTINGUISHED
- o RCP motor bearings temperature (PPCS Group Display-RCPS OR RCP temperature monitor RK-30A recorder) -  $\leq 200^{\circ}\text{F}$

IF CCW lost to RCP(s), THEN perform the following:

- a. Trip the Rx.
- b. Trip affected RCP(s).
- c. Go to E-0, REACTOR TRIP OR SAFETY INJECTION.

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 5 of 9
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>CLOSELY MONITOR PRZR LEVEL AND RCS PRESSURE WHILE LETDOWN IS ISOLATED.</p> <p>*****</p>		
4	<p>Check If Letdown Should Be Isolated:</p> <p>a. Check annunciator A-12, Non-Regen Hx Letdown Out Hi Temp 145° - EXTINGUISHED</p> <p>b. Check excess letdown temperature - LESS THAN 195°F</p>	<p>a. Isolate Normal Letdown:</p> <ol style="list-style-type: none"> <li>1) Close loop B cold leg to REGEN Hx, AOV-427.</li> <li>2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202).</li> <li>3) Place letdown pressure controller, PCV-135, in MANUAL and close valve (demand at 100%)</li> <li>4) Control charging pump speed as necessary to maintain RCP labyrinth seal D/P less than 80 inches.</li> <li>5) Close charging flow control valve, HCV-142.</li> <li>6) Establish excess letdown, if desired (Refer to Attachment EXCESS L/D).</li> </ol> <p>b. Isolate Excess Letdown:</p> <ol style="list-style-type: none"> <li>1) Close excess letdown flow control valve, HCV-123.</li> <li>2) Close EXCESS LTDN LOOP A COLD TO Hx, AOV-310.</li> </ol>

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 6 of 9
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	<p>Check CCW Valve Alignment - NORMAL</p> <p>a. Check MCB CCW valves (Refer to Attachment AT POWER CCW ALIGNMENT)</p> <p>b. Direct AO to check local flow indications per Attachment NORMAL CCW FLOW</p> <p><u>NOTE:</u> o <u>IF</u> Seal Water Hx will be bypassed, <u>THEN</u> an increase in VCT temperature is expected.</p> <p>o <u>IF</u> Seal Water Hx will be isolated, <u>THEN</u> seal return will be to the PRT through RV-314.</p>	Align CCW valves as necessary.
6	<p>Check Seal Water Hx For Tube Leak:</p> <p>o Locally check Seal Water Hx CCW outlet flow - NORMAL (FI-605)</p> <p>o Locally check Seal Water Hx CCW outlet temperature - NORMAL (TI-604)</p> <p>o VCT level - NO UNEXPLAINED INCREASE</p>	<p><u>IF</u> a tube leak is indicated, <u>THEN</u> bypass and isolate Seal Water Hx and, if desired, isolate Seal Return.</p> <p>a. To bypass and isolate Hx perform the following:</p> <ol style="list-style-type: none"> <li>1) Open seal bypass V-394</li> <li>2) Close seal inlet V-265</li> <li>3) Close seal outlet V-321</li> <li>4) Close CCW inlet V-763</li> <li>5) Close CCW outlet V-767</li> </ol> <p>b. <u>IF</u> desired to isolate seal return line, <u>THEN</u> close MOV-313.</p> <p>c. Notify RP to sample RCS for chromates.</p>

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 7 of 9
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: o An evaluation must be made to determine if operation may continue while investigating a CCW leak in containment.

- o Operation may continue with the reactor support coolers isolated. If this occurs, notify higher supervision.

7 Check For CCW Leakage In CNMT:

a. Check CNMT sump A level:

- o Level - STABLE
- o Sump A pumps - OFF

a. IF abnormal increase in CNMT sump level, THEN perform the following:

- 1) Direct RP Tech to sample sump A for chromates.
- 2) Prepare to make CNMT entry to check for CCW leak.

b. RCP oil levels - STABLE

b. IF any RCP oil level increasing uncontrollably, THEN perform the following:

- 1) Trip Reactor.
- 2) Trip affected RCP(s).
- 3) Close CCW supply and return for affected RCP(s).
  - RCP A, MOV-749A and MOV-759A
  - RCP B, MOV-749B and MOV-759B
- 4) Go to E-0, REACTOR TRIP OR SAFETY INJECTION.

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 8 of 9
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	<p>Check for CCW Leakage In AUX BLDG:</p> <ul style="list-style-type: none"> <li>o Start frequency of AUX BLDG sump pump(s) - NORMAL (Refer to RCS daily leakage log)</li> <li>o Waste holdup tank level - STABLE OR INCREASING AS EXPECTED</li> </ul>	<p>Dispatch A0 to investigate AUX BLDG for CCW leakage.</p>
9	<p>Verify CCW System Leak - IDENTIFIED AND ISOLATED</p>	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>a. Direct RP Tech to sample CCW HX SW outlet for chromates.</li> <li>b. Return to Step 2.</li> </ul>
10	<p>Verify CCW Surge Tank Level - APPROXIMATELY 50% AND STABLE</p>	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>a. Open RMW to CCW surge tank, MOV-823.</li> <li>b. Start RMW pump(s).</li> <li>c. Restore CCW surge tank level to 50%.</li> <li>d. Stop RMW pump and close MOV-823.</li> </ul>
11	<p>Direct RP To Sample CCW System For Chromates</p>	

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 9 of 9
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Evaluate Plant Conditions:		
a. CCW system malfunction - IDENTIFIED AND CORRECTED		a. Return to Step 1.
b. CCW system status adequate for power operation (Refer to ITS Section 3.7.7).		b. <u>IF</u> shutdown required, <u>THEN</u> refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN.
NOTE: Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.		
13 Notify Higher Supervision		
14 Return To Procedure Or Guidance In Effect		
-END-		

EOP: AP-CCW.2	TITLE: LOSS OF CCW DURING POWER OPERATION	REV: 15 PAGE 1 of 1
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AP-CCW.2 APPENDIX LIST

TITLE

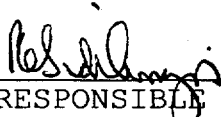
- 1) ATTACHMENT AT POWER CCW ALIGNMENT (ATT-1.0)
- 2) ATTACHMENT EXCESS L/D (ATT-9.1)
- 3) ATTACHMENT NORMAL CCW FLOW (ATT-1.1)

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 1 of 11
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

  
RESPONSIBLE MANAGER

9-14-2001  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_



EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 2' of 11
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A. PURPOSE - This procedure provides the steps necessary to respond to a loss of CCW while the plant is shut down.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure may be entered from:

- a. AP-CCW.1, LEAKAGE INTO THE COMPONENT COOLING LOOP, or
- b. AP-ELEC.3, LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350°F), or
- c. AP-RHR.1, LOSS OF RHR, or
- d. AP-RHR.2, LOSS OF RHR WHILE OPERATING AT REDUCED RCS INVENTORY CONDITIONS, when CCW malfunction indicated.

2. SYMPTOMS - The symptoms of LOSS OF CCW - PLANT SHUTDOWN are:

- a. Annunciator A-6, CONT SPRAY PUMP COOLING WATER OUT LO FLOW 15 GPM, lit, or
- b. Annunciator A-7, (A-15), RCP A (B) CCW RETURN HI TEMP OR LO FLOW 165 GPM 125°F, lit, or
- c. Annunciator A-9, RHR PUMP COOLING WATER OUTLET LO FLOW 15 GPM, lit, or
- d. Annunciator A-13, CCW SURGE TANK LO LEVEL 41.2%, lit, or
- e. Annunciator A-14, SAFETY INJ PUMPS COOLING WATER OUT LO FLOW 25 GPM, lit, or
- f. Annunciator A-17, MOTOR OFF RCP CCWP, lit, or
- g. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSI, lit, or
- h. Annunciator A-24, (A-32), RCP A (B) OIL LEVEL +/- 1.25, lit, or
- i. Annunciator A-31, CCW SYSTEM LO FLOW 1800 GPM, lit or
- j. Annunciator A-12, NON-REGEN HX LETDOWN OUT HI TEMP 145°F lit, or
- k. Annunciator A-18, VCT Hi Temp 145°F.

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 3 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF CCW FLOW TO A RCP IS INTERRUPTED FOR GREATER THAN 2 MINUTES OR IF EITHER RCP MOTOR BEARING TEMPERATURE EXCEEDS 200°F, THEN TRIP THE AFFECTED RCP.</p> <p>o IF CCW IS LOST, THEN SEAL INJECTION SHOULD BE MAINTAINED TO THE RCP(S) UNTIL RCS TEMPERATURE IS LESS THAN 150°F, OR UNTIL CCW IS RESTORED.</p> <p>*****</p> <p><u>NOTE:</u> o If leakage from the CCW system is indicated, then refer to ER-SC.5, HAZARDOUS AND MIXED WASTE MANAGEMENT AND CONTROL, for guidance.</p> <p>o If CCW is lost to operating CS, RHR, or SI pumps, they may be left running for brief periods while isolating a CCW leak.</p>		
1	Check CCW Pump Status:	<u>IF</u> a CCW pump has tripped, <u>THEN</u> perform the following:
	o Both CCW pump breaker white disagreement lights - EXTINGUISHED	a. Ensure the other CCW pump is running.
	o Annunciator A-17, MOTOR OFF, RCP CCWP - EXTINGUISHED	b. Attempt to reset and start the affected CCW pump if required for cooling.
		c. <u>IF</u> no CCW pumps available, <u>THEN</u> go to Step 5.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>CLOSELY MONITOR PRZR LEVEL AND RCS PRESSURE WHILE LETDOWN IS ISOLATED.</p> <p>*****</p>		
2	<p>Check If Letdown Should Be Isolated:</p> <p>a. Check annunciator A-12, Non-Regen Hx Letdown Out Hi Temp 145° - EXTINGUISHED</p> <p>b. Check excess letdown temperature - LESS THAN 195°F.</p>	<p>a. Isolate Normal Letdown:</p> <ol style="list-style-type: none"> <li>1) Close loop B cold leg to REGEN Hx, AOV-427.</li> <li>2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202).</li> <li>3) Place letdown pressure controller, PCV-135, in MANUAL and close valve (demand at 100%).</li> <li>4) Control charging pump speed as necessary to maintain RCP labyrinth seal D/P less than 80 inches.</li> <li>5) Close charging flow control valve, HCV-142.</li> <li>6) Establish excess letdown, if desired (Refer to Attachment EXCESS L/D).</li> </ol> <p>b. Isolate Excess Letdown:</p> <ol style="list-style-type: none"> <li>1) Close excess letdown flow control valve, HCV-123.</li> <li>2) Close EXCESS LTDN LOOP A COLD TO Hx, AOV-310.</li> </ol>

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 5 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	<p>Verify CCW Surge Tank Level Normal:</p> <ul style="list-style-type: none"> <li>o Annunciator A-13, CCW SURGE TANK LO LEVEL 41.2% - EXTINGUISHED</li> <li>o Level - STABLE</li> </ul>	<p><u>IF</u> CCW surge tank level is decreasing, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>a. Open RMW to CCW surge tank, MOV-823.</li> <li>b. Start both RMW pumps.</li> <li>c. Dispatch AO to AUX BLDG to investigate for CCW leak</li> </ul>
4	<p>Verify Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED</p>	<p>Dispatch AO to the AUX BLDG to perform the following:</p> <ul style="list-style-type: none"> <li>a. Throttle CCW to RHR Hxs as necessary to restore CCW pump discharge pressure. <ul style="list-style-type: none"> <li>• MOV-738A</li> <li>• MOV-738B</li> </ul> </li> <li>b. Investigate for CCW leaks.</li> </ul>

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF ANY RCP IS TRIPPED, THEN SHUTDOWN MARGIN REQUIREMENTS SHOULD BE VERIFIED (REFER TO O-3.1, BORON CONCENTRATION FOR THE XENON FREE ALL RODS IN MOST REACTIVE ROD STUCK OUT SHUTDOWN MARGIN).</p> <p>*****</p>		
5	Check RCS Temperature - STABLE OR DECREASING	<p><u>IF</u> S/G cooling available, <u>THEN</u> control S/G ARVs to stabilize RCS temperature. <u>IF</u> S/G ARVs do <u>NOT</u> provide adequate cooling, <u>THEN</u> perform the following:</p> <p>a. Stop all but one RCP.</p> <p>b. Initiate S/G blowdown from both S/Gs.</p> <p>c. Maintain both S/G levels stable by controlling AFW flow.</p>
6	Verify CCW Surge Tank Level - GREATER THAN 10%	<p>Perform the following:</p> <p>a. Stop any running RCP.</p> <p>b. Pull stop both CCW pumps.</p> <p>c. Verify natural circulation (Refer to Attachment NC).</p>

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 7 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check CCW Cooling To RCPs:	
a.	RCPs - ANY RUNNING	a. Go to Step 8.
b.	Check RCP indications:	b. <u>IF</u> CCW lost to RCP(s), <u>THEN</u> perform the following:
o	Annunciator A-7 (A-15), RCP A (B) CCW RETURN HI TEMP OR LOW FLOW 165 GPM 125°F - EXTINGUISHED	1) Stop the affected RCP(s).
o	Verify RCP motor bearing temperatures (PPCS Group Display - RCPS or RK-30A recorder) - LESS THAN 200°F	2) <u>IF</u> no RCPs running, <u>THEN</u> verify natural circulation (Refer to Attachment NC).
8	Check CCW System Leakage - ANY LEAKAGE INDICATED	Go to Step 13.

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 8 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u>   o   <u>IF</u> Seal Water Hx will be bypassed, <u>THEN</u> an increase in VCT temperature is expected.</p> <p>          o   <u>IF</u> Seal Water Hx will be isolated, <u>THEN</u> seal return will be to the PRT through RV-314.</p>	
9	<p>Check Seal Water Hx For Tube Leak:</p> <ul style="list-style-type: none"> <li>• Locally check Seal Water Hx CCW outlet flow - NORMAL (FI-605)</li> <li>• Locally check Seal Water Hx CCW outlet temperature - NORMAL (TI-604)</li> <li>• VCT level - NO UNEXPLAINED INCREASE</li> </ul>	<p><u>IF</u> a tube leak is indicated, <u>THEN</u> bypass and isolate Seal Water Hx and, if desired, isolate Seal Return.</p> <p>a. To bypass and isolate Hx perform the following:</p> <ol style="list-style-type: none"> <li>1) Open seal bypass V-394</li> <li>2) Close seal inlet V-265</li> <li>3) Close seal outlet V-321</li> <li>4) Close CCW inlet V-763</li> <li>5) Close CCW outlet V-767</li> </ol> <p>b. If desired to isolate seal return line close MOV-313.</p> <p>c. Notify RP to sample RCS for chromates.</p>

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13  PAGE 9 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check For CCW Leakage In CNMT:	
a.	Check CNMT sump A level:	a. <u>IF</u> abnormal increase in CNMT sump level, <u>THEN</u> perform the following:
	o Level - STABLE	1) Direct RP Tech to sample sump A for chromates.
	o Sump A pumps - OFF	2) Prepare to make CNMT entry to check for CCW leak.
b.	RCP oil levels - STABLE	b. <u>IF</u> any RCP oil level increasing uncontrollably, <u>THEN</u> perform the following:
		1) Stop affected RCP.
		2) Close CCW supply and return for affected RCP(s).
		• RCP A, MOV-749A and MOV-759A
		• RCP B, MOV-749B and MOV-759B
		3) <u>IF</u> no RCPs running, <u>THEN</u> verify natural circulation (Refer to Attachment NC).
11	Check for CCW Leakage In AUX BLDG:	Dispatch AO to investigate AUX BLDG for CCW leakage.
	o Start frequency of AUX BLDG sump pump(s) - NORMAL (Refer to RCS daily leakage log)	
	o Waste holdup tank level - STABLE OR INCREASING AS EXPECTED	



EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13  PAGE 10 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Verify CCW System Leak - IDENTIFIED AND ISOLATED	Perform the following:  a. Direct RP Tech to sample CCW HX SW outlet for chromates.  b. Return to Step 2.
13	Check CCW Valve Alignment And Flow Rates - AS REQUIRED FOR PLANT CONDITIONS	Realign valves as necessary to restore CCW to individual components.
14	Evaluate Plant Conditions:  a. RHR normal cooling - IN SERVICE  b. Check RCS Cooling: o RCS temperature - STABLE OR DECREASING o CCW system status - ADEQUATE FOR RHR NORMAL COOLING	a. Adjust S/G ARVs as necessary to stabilize RCS temperature and go to Step 15.  b. <u>IF</u> CCW inadequate for RHR normal cooling, <u>THEN</u> go to AP-RHR.1, LOSS OF RHR <u>OR</u> AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.
NOTE: Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.		
15	Notify Higher Supervision	

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 11 of 11
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Return To Procedure Or Guidance In Effect	
		-END-

EOP: AP-CCW.3	TITLE: LOSS OF CCW - PLANT SHUTDOWN	REV: 13 PAGE 1 of 1
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AP-CCW.3 APPENDIX LIST

TITLE

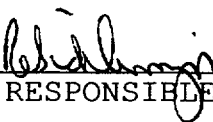
- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT NC (ATT-13.0)
- 3) ATTACHMENT EXCESS L/D (ATT-9.1)
- 4) ATTACHMENT NORMAL CCW FLOW (ATT-1.1)

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9 PAGE 1 of 7
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

  
RESPONSIBLE MANAGER

9-14-2001  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9  PAGE 2 of 7
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- A. PURPOSE - This procedure provides the steps necessary to continue plant operation while investigating an RCC/RPI malfunction.
- B. ENTRY CONDITIONS/SYMPTOMS
  - 1. SYMPTOMS - The symptoms of RCC/RPI MALFUNCTION are;
    - a. Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION lit, or
    - b. Power range NIS indicate a flux tilt, or
    - c. Group step counters for any individual bank are not within 1 step of each other, or
    - d. Incore flux map indicates abnormal flux tilt, or
    - e. Incore thermocouples indicate abnormal power tilt, or
    - f. Individual rods are not within +/- 12 steps of their respective step counters as indicated on MRPI, or
    - g. Annunciator F-29, PPCS AXIAL OR QUADRANT POWER TILT, lit, or,
    - h. Annunciator C-29, MRPI SYSTEM FAILURE.

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9  PAGE 3 of 7
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF AT ANY TIME DURING THIS PROCEDURE, A REACTOR TRIP OR SI OCCURS, E-0, REACTOR TRIP OR SAFETY INJECTION, SHALL BE PERFORMED.</p> <p>*****</p>		
1	Place Rod Control Bank Selector Switch - TO MANUAL	
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o BANK ROD WITHDRAWAL SHOULD NOT BE PERFORMED UNTIL DIRECTED PER APPLICABLE RECOVERY PROCEDURE.</p> <p>o UNTIL THE MRPI SYSTEM IS KNOWN TO BE AT FAULT, A ROD INDICATING GREATER THAN <math>\pm 12</math> STEPS FROM ITS GROUP STEP COUNTER SHOULD BE CONSIDERED A MISALIGNED ROD.</p> <p>*****</p>		
2	Check Dropped Rod Indication:	<p><u>IF</u> the following conditions or indications of a dropped rod exist, <u>THEN</u> go to AP-RCC.3, DROPPED ROD RECOVERY.</p> <p>o Reactor Power - decreasing</p> <p>o Tavg - decreasing</p> <p><u>IF NOT</u>, <u>THEN</u> go to Step 3.</p>
	<p>o Annunciator E-28, POWER RANGE ROD DROP ROD STOP 5%/5 SECONDS - EXTINGUISHED</p> <p>o Annunciator C-14, ROD BOTTOM ROD STOP - EXTINGUISHED</p>	

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9 PAGE 4 of 7
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check Control Rod Alignment:	
	a. Verify all rods in affected group - WITHIN $\pm 12$ STEPS OF ASSOCIATED GROUP STEP COUNTER	a. Refer to ITS Section 3.1.4 and go to Step 4.
	b. Go to Step 6	
	<p><u>NOTE:</u> Step 4 is an attempt to determine whether a rod is misaligned or whether the MRPI System is malfunctioning.</p>	
4	Check QPTR - LESS THAN 1.02	<p><u>IF</u> QPTR greater than 1.02, <u>THEN</u> computer value should be verified using 0-6.4 to prevent action based on failed computer inputs.</p>

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9 PAGE 5 of 7
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> The incore flux mapping system may aid in evaluating rod alignment depending on rod location.</p>		
5	Evaluate Control Rod Operability:	
	<ul style="list-style-type: none"> <li>a. Verify less than two misaligned rods</li> <li>b. Verify adequate shutdown margin (Refer to 0-3.2, SHUTDOWN MARGIN FOR AN OPERATING REACTOR)</li> <li>c. Direct I&amp;C to locally investigate rod failure</li> <li>d. Rod failure identified and corrected - MISALIGNED ROD MOVEABLE</li> <li>e. Restore misaligned rod (Refer to ER-RCC.2, RESTORING A MISALIGNED ROD)</li> </ul>	<ul style="list-style-type: none"> <li>a. <u>IF</u> two or more rods are misaligned, <u>THEN</u> initiate plant shutdown. (Refer to 0-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN)</li> <li>b. Borate and reduce turbine load as necessary.</li> <li>d. Perform the following:               <ul style="list-style-type: none"> <li>1) Consult Reactor Engineer and ITS section 3.1.4 for operational concerns.</li> <li>2) Return to step 2.</li> </ul> </li> </ul>
6	Verify Affected Group Step Counters Operable:	Refer to ITS section 3.1.7 for required actions.
	<ul style="list-style-type: none"> <li>a. Affected bank group step counter movement - CONSISTENT WITH MRPI TRANSITIONS (Evaluate affected bank using PT-1, ROD CONTROL SYSTEM)</li> <li>b. Group step counters for affected bank - WITHIN 1 STEP OF EACH OTHER</li> </ul>	



EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9  PAGE 6 of 7
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> IF the MRPI CRT fails, THEN the PPCS can be used for rod position indication until the CRT is made operable. Rod position indication can be retrieved from the PPCS by selecting the "CBAW" display button.</p>		
7	<p>Verify All Individual Rod Position Indication Per Bank Operable:</p> <ul style="list-style-type: none"> <li>o MRPI system - NO MRPI SYSTEM ALARMS</li> <li>o MRPI system - NO KNOWN PROBLEMS WITH MRPI SYSTEM THAT COULD RENDER ROD POSITION INDICATION INOPERABLE</li> </ul>	<p>Refer to ITS section 3.1.7 for required action.</p>
8	<p>Establish Stable Plant Conditions:</p> <ul style="list-style-type: none"> <li>a. Tav<sub>g</sub> - TRENDING TO TREF</li> <li>b. PRZR pressure - TRENDING TO 2235 PSIG</li> <li>c. PRZR level - TRENDING TO PROGRAM</li> <li>d. Rod insertion limit alarms - EXTINGUISHED</li> <li>e. NIS PR <math>\Delta</math>I - WITHIN <math>\pm</math> 5% OF TARGET VALUE</li> </ul>	<ul style="list-style-type: none"> <li>a. Insert control rods or, if necessary, decrease turbine load to match Tav<sub>g</sub> to Tref.</li> <li>b. Verify proper operation of PRZR heaters and spray or take manual control of PRZR pressure controller 431K. <u>IF</u> pressure can <u>NOT</u> be controlled, <u>THEN</u> refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.</li> <li>c. Verify proper operation of charging pump speed controllers or take manual control of speed controllers to control PRZR level.</li> <li>d. Borate as necessary and withdraw control rods to clear insertion limit alarms (refer to affected rod bank alarm response procedures if necessary).</li> <li>e. Borate/dilute to restore <math>\Delta</math>I to within limits.</li> </ul>

EOP: AP-RCC.2	TITLE: RCC/RPI MALFUNCTION	REV: 9 PAGE 7 of 7
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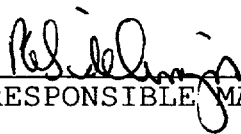
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Evaluate Plant Conditions:	
	a. Rod/MRPI malfunction - REPAIRED	a. Return to Step 4.
	b. Verify control rod operability - OPERABILITY RESTORED (Refer to PT-1, ROD CONTROL SYSTEM)	b. Refer to ITS section 3.1.4 and consult plant staff for further guidance.
	NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
10	Notify Higher Supervision	
11	Return To Procedure Or Guidance In Effect	
	-END-	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 1 of 13
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

  
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9-14-2001  
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REVIEWED BY: \_\_\_\_\_

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 2 of 13
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A. PURPOSE - This procedure provides guidance in the event of a loss of RHR cooling at or above normal loop levels. (i.e. RCS loop levels of 64 inches or greater)

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from;

- a. FR-C.3, RESPONSE TO SATURATED CORE COOLING, or
- b. AP-ELEC.3, LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350°F), when RHR flow can NOT be restored, or
- c. AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN when CCW is inadequate for RHR cooling

2. SYMPTOMS - The following are symptoms of LOSS OF RHR;

- a. No RHR pumps running, or
- b. Annunciator A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW 2900 GPM (Set at 400 GPM per 0-2.2 in RHR Cooling mode), lit, or
- c. Unexpected increase in temperature while on RHR cooling, or
- d. Erratic or no flow on FI-626, RHR Loop Flow, or
- e. Annunciator J-9, SAFEGUARD BREAKER TRIP, lit.

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 3 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>DO NOT START ANOTHER RHR PUMP UNTIL THE CAUSE OF THE ABNORMAL RHR INDICATIONS HAS BEEN DETERMINED. IF A RUNNING PUMP HAS TRIPPED FOR REASONS OTHER THAN LOSS OF SUCTION FLOW, THEN REDUNDANT PUMP MAY BE STARTED.</p> <p>*****</p> <p><u>NOTE:</u> Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p>		
1	Check PRZR Wide Range Level - GREATER THAN 0 INCHES	<p><u>IF</u> RCS loop level indicator in service and loop level less than 64 inches, <u>THEN</u> go to AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.</p>

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 4 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check If RHR Pump(s) Should Be Stopped:	
a.	RHR pump - ANY RUNNING	a. Go to Step 3.
b.	Check RHR pump flow - LESS THAN 1500 GPM PER PUMP	b. Decrease RHR flow as necessary. IF RHR flow can <u>NOT</u> be controlled, <u>THEN</u> perform the following: <ol style="list-style-type: none"> <li>1) Stop running RHR pump.</li> <li>2) Dispatch an AO with a locked valve key to locally throttle RHR Hx outlet valves to approximately half open. <ul style="list-style-type: none"> <li>• A RHR Hx, HCV-625 handwheel</li> <li>• B RHR Hx, HCV-624 handwheel</li> </ul> </li> <li>3) Start an RHR pump.</li> <li>4) Direct AO to locally adjust RHR flow to less than 1500 gpm.</li> </ol>
c.	RHR pumps cavitating: <ol style="list-style-type: none"> <li>o RHR pump flow - OSCILLATING</li> <li>-OR-</li> <li>o RHR pump NPSH - APPROXIMATELY ZERO (PPCS Group Display NPSH)</li> </ol>	c. Go to Step 17.
d.	Stop RHR pumps	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 5 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o DO NOT INITIATE ANY ACTIONS WHICH MAY ADD POSITIVE REACTIVITY TO THE CORE.</p> <p>o NOTIFY S/G OFFICE THAT CNMT BREATHING AIR MAY BE LOST.</p> <p>o IF REFUELING IN PROGRESS, THEN STOP REFUELING OPERATIONS (NOTIFY REFUELING SRO).</p> <p>*****</p> <p><u>NOTE:</u> Personnel remaining in CNMT to assist in event mitigation should consult Health Physics for changes in radiological concerns.</p> <p>3 Initiate Actions To Protect Personnel In CNMT:</p> <table border="0"> <tr> <td>a. Evacuate non-essential personnel from CNMT</td> <td>b. Manually start available CNMT RECIRC fans.</td> </tr> <tr> <td>b. Verify all available CNMT RECIRC fan(s) - RUNNING</td> <td>c. Refer to appropriate alarm response procedures for required actions.</td> </tr> <tr> <td>c. Initiate monitoring of CNMT area and process radiation monitors</td> <td>d. Within 4 hours, close all CNMT penetrations to outside atmosphere.</td> </tr> <tr> <td>d. Verify CNMT penetrations with direct access to outside atmosphere - CLOSED (Refer to Attachment CNMT CLOSURE)</td> <td></td> </tr> </table>			a. Evacuate non-essential personnel from CNMT	b. Manually start available CNMT RECIRC fans.	b. Verify all available CNMT RECIRC fan(s) - RUNNING	c. Refer to appropriate alarm response procedures for required actions.	c. Initiate monitoring of CNMT area and process radiation monitors	d. Within 4 hours, close all CNMT penetrations to outside atmosphere.	d. Verify CNMT penetrations with direct access to outside atmosphere - CLOSED (Refer to Attachment CNMT CLOSURE)	
a. Evacuate non-essential personnel from CNMT	b. Manually start available CNMT RECIRC fans.									
b. Verify all available CNMT RECIRC fan(s) - RUNNING	c. Refer to appropriate alarm response procedures for required actions.									
c. Initiate monitoring of CNMT area and process radiation monitors	d. Within 4 hours, close all CNMT penetrations to outside atmosphere.									
d. Verify CNMT penetrations with direct access to outside atmosphere - CLOSED (Refer to Attachment CNMT CLOSURE)										

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16 PAGE 6 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check RHR Cooling Valve Alignment - NORMAL (Refer to Attachment NORMAL RHR COOLING)	Manually or locally align valves as necessary.
<p style="text-align: center;">*****  <u>CAUTION</u>            THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.            *****</p>		
5	Check IA System:	
a.	Verify 2 IA compressors - RUNNING	a. Manually start IA compressors as necessary (75 kw each). <u>IF</u> IA compressors can <u>NOT</u> be started manually, <u>THEN</u> dispatch AO to locally reset and start compressors (75 kw each).
b.	Check IA supply	b. <u>IF</u> IA pressure can <u>NOT</u> be restored, <u>THEN</u> perform the following:
	o Pressure - GREATER THAN 60 PSIG	1) Dispatch AO with a locked valve key to locally throttle RHR Hx outlet valves to approximately half open.
	o Pressure - STABLE OR INCREASING	<ul style="list-style-type: none"> <li>• A RHR Hx, HCV-625 handwheel</li> <li>• B RHR Hx, HCV-624 handwheel</li> </ul>
		2) <u>WHEN</u> conditions permit, <u>THEN</u> refer to AP-IA.1, LOSS OF INSTRUMENT AIR, to restore IA.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6	Monitor RCS Temperature - GREATER THAN 200°F	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>a. Notify Plant Staff to attempt to establish CNMT integrity <u>AND</u> CNMT heat removal capability.</li> <li>b. Go to step 8.</li> </ul> <p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> <li>o CHANGES IN RCS PRESSURE COULD RESULT IN INACCURACIES IN RCS LOOP LEVEL INDICATION</li> <li>o UNSTABLE OR FLUCTUATING LEVEL INSTRUMENTS SHOULD NOT BE RELIED ON FOR INDICATION OF RCS INVENTORY.</li> </ul> <p>*****</p>
7	Verify RCS Intact:	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>o PRZR level - GREATER THAN 5% AND STABLE</li> <li>o RCS pressure - STABLE</li> <li>o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</li> <li>o RCS vent paths - CLOSED</li> </ul> <ul style="list-style-type: none"> <li>a. Verify charging line flow control valve, HCV-142, open as necessary.</li> <li>b. Ensure charging line valve to loop B cold leg, AOV-294, open.</li> <li>c. Start charging pumps as necessary.</li> <li>d. Control charging pump speed and letdown flow as necessary to stabilize RCS conditions. <ul style="list-style-type: none"> <li>• PRZR pressure</li> <li>• PRZR level</li> <li>• Loop level</li> </ul> </li> </ul> <p><u>IF</u> charging flow greater than 75 gpm with letdown isolated <u>OR</u> unable to verify RCS inventory, <u>THEN</u> go to AP-RCS.4, SHUTDOWN LOCA.</p>

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LOSS OF RHR

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8 Establish Conditions To Start  
RHR Pump:

a. RHR pump - AVAILABLE

a. Perform the following:

1) Start trending core exit TCs.

2) IF RCS closed, THEN go to  
Step 10. IF RCS open to  
atmosphere, THEN go to  
Step 16.

b. Verify CCW cooling to RHR system  
in service

b. Perform the following:

o CCW pumps - AT LEAST ONE  
RUNNING

1) Ensure at least one CCW pump  
running.

o CCW to RHR Hxs, MOV-738A AND  
MOV-738B - OPEN AS NECESSARY

2) Open MOV-738A and MOV-738B as  
necessary.

IF CCW can NOT be restored, THEN  
continue with Step 9 while  
attempting to restore CCW (Refer  
to AP-CCW.3, LOSS OF CCW - PLANT  
SHUTDOWN).

c. Close RHR pump flow control  
valves (controllers at 100%  
demand)

- HCV-624
- HCV-625

d. Place RHR Hx bypass valve,  
HCV-626, to MANUAL and close  
valve

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL OR PRESSURE DECREASE DUE TO SHRINK OR VOID COLLAPSE.</p> <p>*****</p>		
9	Restore RHR Flow:	
	a. Start one RHR pump - RHR PUMP RUNNING	a. Go to Step 9e.
	b. Check RHR flow - LESS THAN 1500 GPM PER PUMP	b. Manually adjust RHR flow as necessary.
	c. Adjust RHR Hx bypass flow control valve, HCV-626, to desired flowrate	
	d. Place RHR Hx bypass flow control valve, HCV-626, controller in AUTO	
	e. RHR flow - RESTORED	e. Perform the following:
		1) Start trending core exit T/Cs.
		2) <u>IF</u> RCS closed, <u>THEN</u> go to Step 10. <u>IF</u> RCS vented to atmosphere, <u>THEN</u> go to Step 16.
	f. Open RHR Hx outlet valves as necessary to control RCS temperature	
	<ul style="list-style-type: none"> <li>• HCV-624</li> <li>• HCV-625</li> </ul>	

EOP: AP-RHR.1	TITLE: LOSS OF RHR	REV: 16  PAGE 10 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 Monitor RCS Temperature:		
a. RCS temperature - STABLE OR DECREASING		a. <u>IF</u> RCS closed, <u>THEN</u> go to Step 11. <u>IF</u> RCS open to atmosphere, <u>THEN</u> go to Step 16.
b. Go to Step 19		
11 Check Any S/G Level - GREATER THAN 17%		Verify at least 200 gpm AFW flow available. <u>IF NOT</u> , <u>THEN</u> go to Step 17.
12 Check RCS Pressure - GREATER THAN 300 PSIG		Increase RCS pressure to greater than 300 psig. <u>IF</u> RCS pressure can <u>NOT</u> be increased, <u>THEN</u> go to Step 17.
13 Check RCP Status - ANY RCP RUNNING		Perform the followig:  a. Establish conditions for starting an RCP.  o Verify bus 11A or 11B energized.  o Refer to Attachment RCP START.  b. Start one RCP.  <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation. (Refer to Attachment NC.)  <u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14 Establish Condenser Steam  
Dump Manual Control:

- a. Verify condenser available:
  - o Any MSIV - OPEN
  - o Annunciator G-15, STEAM DUMP  
ARMED - LIT
- b. Place condenser steam dump  
controller HC-484 in MANUAL
- c. Place steam dump mode selector  
switch to MANUAL
- d. Open steam dump valves as  
necessary to stabilize RCS  
temperature

15 Monitor RCS Temperature:

- a. RCS temperature - STABLE OR  
DECREASING
- b. Go to Step 18

a. Perform the following:

- 1) Place S/G ARV controller in  
MANUAL and open ARVs as  
necessary to stabilize RCS  
temperature.
- 2) Go to Step 15.

a. IF dumping steam does NOT  
provide adequate cooling, THEN  
perform the following:

- 1) Initiate S/G blowdown from  
both S/Gs.
- 2) Maintain both S/G levels  
stable by controlling AFW  
flow.
- 3) Go to Step 17.

## STEP

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 16 Check RCS Conditions:

- a. Rx vessel head - REMOVED
- b. Stop refueling operations if in progress
- c. Verify Refueling Cavity Level - GREATER THAN 23 FEET ABOVE VESSEL FLANGE
- d. Verify refueling cavity sweep fans - RUNNING

a. Go to Step 17.

c. Increase refueling cavity level to greater than 23 feet (Refer to O-15.3, FILLING REFUELING CANAL).

d. Locally start refueling cavity sweep fans if available.

## 17 Check CCW System Operation:

- o CCW pumps - AT LEAST ONE RUNNING
- o CCW to RHR Hxs, MOV-738A AND MOV-738B - OPEN AS NECESSARY
- o Annunciator A-21, COMP COOLING HX OUT HI TEMP - EXTINGUISHED
- o Annunciator A-22, CCW PUMP DISCHARGE LO PRESS - EXTINGUISHED
- o Annunciator A-30, CCW PUMP INLET HEADER HI TEMP - EXTINGUISHED

To restore CCW cooling to RHR Hxs, perform the following:

- a. Ensure the standby CCW pump is running.
- b. Open MOV-738A and MOV-738B as necessary.

IF CCW can NOT be restored, THEN continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> Consult with Plant Staff to determine alternatives for long term cooling.</p>	
18 Monitor RHR Cooling:	Perform the following:	
<ul style="list-style-type: none"> <li>o RHR cooling - RESTORED</li> <li>o RCS temperature - STABLE OR DECREASING</li> </ul>	<ul style="list-style-type: none"> <li>a. Evaluate alternatives for long term cooling (Consult Plant Staff) <ul style="list-style-type: none"> <li>• Consider establishing secondary heat sink</li> <li>• Refer to ER-RHR.1, RCDT PUMP OPERATION FOR CORE COOLING</li> <li>• Consider RCS feed and bleed</li> </ul> </li> <li>b. Continue attempts to restore RHR to operable.</li> <li>c. Return to Step 3.</li> </ul>	
	<p><u>NOTE:</u> Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.</p>	
19 Notify Higher Supervision		
20 Return to Procedure Or Guidance In Effect		
	-END-	

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AP-RHR.1 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT NORMAL RHR COOLING (ATT-14.0)
- 3) ATTACHMENT RCP START (ATT-15.0)
- 4) ATTACHMENT NC (ATT-13.0)
- 5) ATTACHMENT CNMT CLOSURE (ATT-3.1)

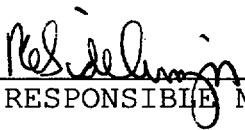


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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

  
RESPONSIBLE MANAGER

9-14-2001  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 10  PAGE 2 of 14
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A. PURPOSE - This procedure provides guidance necessary for maintaining core cooling and protecting the reactor core in the event that RHR cooling is lost during RCS reduced inventory operation, (i.e., at indicated Loop Levels of less than 64 inches with fuel in the vessel).

B. ENTRY CONDITIONS/SYMPTOMS

1. SYMPTOMS - The following symptoms are indicative of LOSS OF RHR AT RCS REDUCED INVENTORY CONDITIONS:
  - a. No RHR pumps running, or
  - b. Annunciator A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW 2900 GPM (Set at 400 GPM per 0-2.2 in RHR Cooling mode) lit, or
  - c. Unexpected increase in RCS temperature while on RHR cooling at low loop levels, or
  - d. Erratic or no flow on FI-626

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> <li>o CHANGES IN RCS PRESSURE COULD RESULT IN INACCURACIES IN RCS LOOP LEVEL INDICATIONS.</li> <li>o SHOULD CORE BOILING OCCUR, "SURGE LINE FLOODING" MAY RESULT IN RCS PRESSURIZATION AND ERRONEOUS HIGH LOOP LEVEL INDICATION.</li> <li>o DO NOT START ANOTHER RHR PUMP UNTIL THE CAUSE OF THE ABNORMAL RHR INDICATIONS HAS BEEN DETERMINED AND CORRECTED. IF A RUNNING PUMP HAS TRIPPED FOR REASONS OTHER THAN LOW LOOP LEVEL OR LOSS OF SUCTION FLOW, THEN REDUNDANT PUMP MAY BE STARTED.</li> <li>o IA TO CNMT MAY BE REQUIRED FOR RCS MAKEUP AND SHOULD NOT BE ISOLATED UNTIL DIRECTED BY THIS PROCEDURE.</li> </ul> <p>*****</p> <p><u>NOTE:</u> Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p> <p>1 Initiate CNMT Closure (Refer to O-2.3.1A, CONTAINMENT CLOSURE CAPABILITY IN TWO HOURS DURING RCS REDUCED INVENTORY OPERATION)</p>		

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 2 Check If RHR Pumps Should Be Stopped:

- a. RHR pump - ANY RUNNING
- b. Check RCS level:
  - o Level - GREATER THAN 6 INCHES
  - o Level - STABLE
- c. RHR flow - LESS THAN 500 GPM
- d. RHR pumps cavitating:
  - o RHR pump flow - OSCILLATING

- a. Go to Step 3.
- b. Stop RHR pumps and go to Step 3.
- c. Reduce RHR flow as necessary.
- d. Go to Step 18.

-OR-

- o RHR pump NPSH - APPROXIMATELY  
ZERO (PPCS Group Display NPSH)
- e. Stop RHR pumps

## 3 Isolate Letdown And Known Drain Paths

- a. Verify the following valves - CLOSED
  - RCDT pump suctions from sump B, MOV-1813A and MOV-1813B
  - Loop B cold leg to REGEN Hx, AOV-427
  - Low pressure letdown pressure control valve, PCV-135
  - RHR letdown flow control valve, HCV-133
  - Excess letdown isolation valve, AOV-310
- b. Evaluate normal drain lineups
- c. Evaluate maintenance activities affecting RCS or RHR system

- a. Manually close valves.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Start Available CNMT RECIRC Fans	
<p><u>NOTE:</u> Personnel remaining in CNMT to assist in event mitigation should consult Radiation Protection for changes in radiological concerns.</p>		
5	Initiate Actions To Protect Personnel In CNMT:	
	a. Evacuate non-essential personnel from CNMT	
	b. Periodically monitor CNMT radiation	
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o PERSONNEL WORKING IN CNMT SHOULD BE WARNED BEFORE REFILLING THE RCS TO AVOID INADVERTANT CONTAMINATION OF PERSONNEL WORKING NEAR RCS OPENINGS.</p> <p>o THE S/G OFFICE SHOULD BE NOTIFIED BEFORE RAISING LOOP LEVEL.</p> <p>o ONLY BORATED WATER SHOULD BE ADDED TO THE RCS TO MAINTAIN ADEQUATE SDM.</p> <p>*****</p>		
* 6	Check RCS Temp	Go to Step 11.
	o Core Exit TC's - LESS THAN 200°F	
	o No visual steam at RCS vents	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check RCS Loop Level - LESS THAN 30 INCHES	Go to Step 12.
<p><u>NOTE:</u> The next four steps are sequenced to indicate the preferred order of RCS refill methods if core boiling is not occurring.</p>		
8	Refill The RCS By Gravity Feed From The RWST	
	a. Dispatch AO to locally throttle open RHR pump suction from RWST, MOV-856	
	b. Close RHR pump discharge valve to loop B cold leg, MOV-720	
	c. Verify MOV-856 indicates midposition	c. Perform the following:
		1) Open MOV-720.
		2) Go to Step 9.
	d. Verify RCS loop level - INCREASING AS EXPECTED	d. Perform the following:
		1) Close MOV-856.
		2) Open MOV-720.
		3) <u>IF</u> RCS loop level greater than 6 inches, <u>THEN</u> go to Step 9. <u>IF NOT</u> , <u>THEN</u> go to Step 11.
	e. Check RCS loop level - GREATER THAN 30 INCHES	e. Continue filling RCS. <u>WHEN</u> RCS loop level greater than 30 inches, <u>THEN</u> do Steps 8f through h.
	f. Manually close MOV-856	f. Direct AO to locally close valve.
	g. Open RHR pump discharge valve to B loop cold leg, MOV-720	g. <u>IF</u> MOV-720 does <u>NOT</u> open, <u>THEN</u> open core deluge valves MOV-852A and MOV-852B.
	h. Go to Step 12	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Refill The RCS By Charging To B Loop Cold Leg:	
a.	Verify IA to CNMT, AOV-5392 - OPEN	a. Manually open valve.
b.	Open and verify open charging line valve to loop B cold leg, AOV-294	b. Open alternate charging line to loop A cold leg, AOV-392B, and go to Step 9d.
c.	Verify HCV-142 demand at 0%	
d.	Start operable charging pump and increase flow to maximum	
e.	Verify charging flow - GREATER THAN ZERO	e. Perform the following: 1) Stop operating charging pump. 2) Close AOV-294. 3) Go to Step 10.
f.	Verify RCS loop level - INCREASING AS EXPECTED	f. Perform the following: 1) Open or verify open alternate charging line to loop A cold leg, AOV-392B. 2) Close AOV-294. 3) Verify loop level increasing as expected. <u>IF NOT, THEN</u> perform the following: a) Stop operating charging pump. b) Close AOV-392B. c) Close IA to CNMT, AOV-5392. d) Go to Step 10.
g.	Check RCS loop level - GREATER THAN 30 INCHES	g. Continue filling RCS. <u>WHEN</u> loop level greater than 30 inches, <u>THEN</u> do Steps 9h through j.
h.	Stop running charging pump	
i.	Close or verify closed charging line valve to loop B cold leg, AOV-294 and AOV-392B	
j.	Go to Step 12	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Refill RCS Using SI Pumps To Cold Legs:	
a.	Open the appropriate SI pump discharge valves to loop cold legs <ul style="list-style-type: none"> <li>• A SI Pump - MOV-878B</li> <li>• B SI Pump - MOV-878D</li> <li>• C SI Pump - MOV-878B AND/OR MOV-878D</li> </ul>	a. Ensure at least one valve open.  <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> <li>• MOV-878B, MCC D position 8C</li> <li>• MOV-878D, MCC D position 8F</li> </ul>
b.	Open SI pump suction valves from RWST <ul style="list-style-type: none"> <li>• MOV-825A</li> <li>• MOV-825B</li> </ul>	b. Ensure at least one valve open.  <u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers. <ul style="list-style-type: none"> <li>• MOV-825A, MCC C position 9J</li> <li>• MOV-825B, MCC D position 9J</li> </ul>
c.	Start operable SI pump	
d.	Verify the following: <ul style="list-style-type: none"> <li>o SI flow - GREATER THAN ZERO</li> <li>o RCS loop level - INCREASING AS EXPECTED</li> </ul>	d. Perform the following: <ol style="list-style-type: none"> <li>1) Stop operating SI pump.</li> <li>2) Close loop cold leg inlet valves. <ul style="list-style-type: none"> <li>• MOV-878B</li> <li>• MOV-878D</li> </ul> </li> <li>3) Go to step 11.</li> </ol>
e.	Check RCS loop level - GREATER THAN 30 INCHES	e. Continue filling RCS. <u>WHEN</u> loop level greater than 30 inches, <u>THEN</u> do steps 10f through h.
f.	Stop running SI pump	
g.	Close SI discharge valves to loop cold legs, MOV-878B and MOV-878D	
h.	Go to Step 12	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> SI Pump makeup should not be secured when core boiling is indicated.</p> <p>11 Refill RCS Using SI Pumps To Hot Legs:</p>	
	<p>a. Open the appropriate SI pump discharge valves to loop hot legs</p> <ul style="list-style-type: none"> <li>• A SI Pump - MOV-878A</li> <li>• B SI Pump - MOV-878C</li> <li>• C SI Pump - MOV-878A AND/OR MOV-878C</li> </ul>	<p>a. Ensure at least one valve open.</p> <p><u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers.</p> <ul style="list-style-type: none"> <li>• MOV-878A, MCC C position 8C</li> <li>• MOV-878C, MCC C position 8F</li> </ul>
	<p>b. Open SI pump suction valves from RWST</p> <ul style="list-style-type: none"> <li>• MOV-825A</li> <li>• MOV-825B</li> </ul>	<p>b. Ensure at least one valve open.</p> <p><u>IF</u> valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to check breakers.</p> <ul style="list-style-type: none"> <li>• MOV-825A, MCC C position 9J</li> <li>• MOV-825B, MCC D position 9J</li> </ul>
	<p>c. Start operable SI pump</p>	
	<p>d. Verify the following:</p> <ul style="list-style-type: none"> <li>o SI flow - GREATER THAN ZERO</li> <li>o RCS loop level - INCREASING AS EXPECTED</li> </ul>	<p>d. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Stop operating SI pump.</li> <li>2) Close loop hot leg inlet valves. <ul style="list-style-type: none"> <li>• MOV-878A</li> <li>• MOV-878C</li> </ul> </li> <li>3) Ensure makeup flow is initiated <ul style="list-style-type: none"> <li>• Gravity feed from RWST</li> <li>• Charging pumps</li> <li>• SI pumps to cold legs</li> <li>• VCT overpressure</li> <li>• RWST purification pump</li> </ul> </li> </ol>
	<p>e. Operate SI Pump as necessary to maintain the following parameters:</p> <ul style="list-style-type: none"> <li>o Core Exit TC's - LESS THAN 200°F</li> <li>o No visual steam at RCS vents</li> <li>o RCS loop level - GREATER THAN 30 INCHES</li> </ul>	<p>e. <u>IF</u> core exit TC's continue to increase, <u>THEN</u> return to Step 9 to establish additional charging or SI flow to the RCS cold legs.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Identify And Isolate Any RCS Leakage	
	<p><u>NOTE:</u> If adequate time to completely vent the RHR system is not available, then air can be swept out of the RHR lines by running an RHR pump at a flowrate between 1200 gpm and 1400 gpm.</p>	
13	Vent RHR System As Necessary	
	<p>a. Maintain RCS level while venting RHR system</p> <p>b. Direct AO to vent RHR suction line from loop A at valve V-2764 (in CNMT by loop A)</p>	
	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>THE RHR PUMP FLOW CONTROL VALVES WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.</p> <p>*****</p>	
14	Check IA system:	Reset and start additional IA compressors as necessary (75 kw each).
	o Verify adequate air compressors - RUNNING	
	o Verify IA pressure - GREATER THAN 60 PSIG	<p><u>IF</u> IA pressure can <u>NOT</u> be restored, <u>THEN</u> perform the following:</p> <p>a. Dispatch AO with locked valve key to locally throttle RHR Hx outlet valves to approximately half open.</p> <ul style="list-style-type: none"> <li>• A RHR Hx, HCV-625 handwheel</li> <li>• B RHR Hx, HCV-624 handwheel</li> </ul> <p>b. <u>WHEN</u> conditions permit, <u>THEN</u> refer to AP-IA.1, LOSS OF INSTRUMENT AIR, to restore IA.</p>

EOP:

AP-RHR.2

TITLE:

LOSS OF RHR WHILE OPERATING AT RCS REDUCED  
INVENTORY CONDITIONS

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Establish Conditions To Start  
RHR Pump:

- |   |  |
|---|--|
| a. Check RHR cooling valve alignment - NORMAL (Refer to Attachment NORMAL RHR COOLING)  | a. Manually or locally align valves as necessary.  |
| b. Verify CCW cooling to RHR system - IN SERVICE  | b. Restore CCW cooling.  |
| c. Verify the following RCS conditions: <ul style="list-style-type: none"><li>o Core exit TC's - LESS THAN 200°F</li><li>o No visual steam at RCS vents</li><li>o RCS loop level - GREATER THAN 30 INCHES</li></ul> | c. Perform the following: <ul style="list-style-type: none"><li>1) Start trending core exit TCs.</li><li>2) Return to Step 5.</li></ul>  |
| d. RHR pump - AVAILABLE   | d. Perform the following: <ul style="list-style-type: none"><li>1) Start trending core exit TCs.</li><li>2) Place RCDT pumps in service (Refer to ER-RHR.1, RCDT OPERATION FOR CORE COOLING).</li><li>3) Return to Step 5.</li></ul> |

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 10  PAGE 12 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL DECREASE DUE TO SHRINK OR VOID COLLAPSE.</p> <p>*****</p>		
16	Restore RHR Flow:	
a.	Close RHR pump flow control valves <ul style="list-style-type: none"> <li>• HCV-624</li> <li>• HCV-625</li> </ul>	a. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> ensure AO has locally throttled RHR Hx outlet valves and go to step 16c.
b.	Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve	
c.	Start one RHR pump	
d.	Ensure RHR flow - LESS THAN 1500 GPM	d. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> dispatch AO with locked valve key to locally adjust flow using RHR Hx outlet valves. <ul style="list-style-type: none"> <li>• A RHR Hx, HCV-625 handwheel</li> <li>• B RHR Hx, HCV-624 handwheel</li> </ul>
e.	Check RCS loop level - GREATER THAN 30 INCHES	e. Establish adequate makeup flow to stabilize RCS loop level at greater than 30 inches.
f.	Gradually increase RHR bypass flow to desired flowrate	
g.	RHR flow - RESTORED	g. Perform the following: <ol style="list-style-type: none"> <li>1) Start trending core exit T/Cs.</li> <li>2) Place RCDT pumps in service (Refer to ER-RHR.1, RCDT OPERATION FOR CORE COOLING).</li> <li>3) Return to Step 5.</li> </ol>
h.	Establish desired RCS cooldown rate	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 10  PAGE 13 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> Consult with Plant Staff to determine alternatives for long term cooling.</p>	
17	Establish Stable Plant Conditions:	
	<ul style="list-style-type: none"> <li>a. Verify Core Exit TC's - LESS THAN 200°F</li> <li>b. Check RCS loop level: <ul style="list-style-type: none"> <li>o Level - GREATER THAN 30 INCHES</li> <li>o Level - STABLE</li> </ul> </li> <li>c. Stop any running SI pump</li> <li>d. Stop any running charging pump</li> <li>e. Maintain RCS level stable using RWST gravity feed as necessary</li> </ul>	<ul style="list-style-type: none"> <li>a. Continue cooling with RHR. Return to Step 16d.</li> <li>b. <u>IF</u> RCS loop level increasing, <u>THEN</u> reduce makeup rate to stabilize level. <u>IF</u> RCS loop level decreasing, <u>THEN</u> return to Step 8.</li> <li>e. Initiate makeup to the RCS using either of the following: <ul style="list-style-type: none"> <li>o One charging pump at maximum flow</li> </ul> </li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o One SI pump</li> </ul>
18	Check CCW System Operation:	To restore CCW cooling to RHR Hxs, perform the following:
	<ul style="list-style-type: none"> <li>o CCW pumps - AT LEAST ONE RUNNING</li> <li>o CCW to RHR Hxs, MOV-738A AND MOV-738B - OPEN AS NECESSARY</li> <li>o Annunciator A-21, COMP COOLING HX OUT HI TEMP - EXTINGUISHED</li> <li>o Annunciator A-22, CCW PUMP DISCHARGE LO PRESS - EXTINGUISHED</li> <li>o Annunciator A-30, CCW PUMP INLET HEADER HI TEMP - EXTINGUISHED</li> </ul>	<ul style="list-style-type: none"> <li>a. Ensure the standby CCW pump is running.</li> <li>b. Open MOV-738A and MOV-738B as necessary.</li> </ul> <p><u>IF</u> CCW can <u>NOT</u> be restored, <u>THEN</u> continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).</p>

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 10  PAGE 14 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check Core Exit TC's:  o Temperature - LESS THAN 140°F  o Temperature - STABLE OR DECREASING	Continue cooling with RHR. Return to Step 16d.
20	Initiate Monitoring of RCS Temperature  <u>NOTE:</u> Refer to 0-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
21	Notify Higher Supervision	
22	Return To Procedure Or Guidance In Effect	
	-END-	

EOP: AP-RHR.2	TITLE: LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	REV: 10  PAGE 1 of 1
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AP-RHR.2 APPENDIX LIST

TITLE

- 1) ATTACHMENT NORMAL RHR COOLING (ATT-14.0)

EOP: ATT-15.0	TITLE: ATTACHMENT RCP START	REV: 8 PAGE 1 of 3
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Responsible Manager

*Bob Williams*

Date

9-14-2001

**CAUTION:** IF seal outlet temperature is greater than 235°F, THEN CCW thermal barrier cooling and seal injection should NOT be established to the affected RCP(s). Both of these methods of seal cooling could have unintended consequences that result in additional pump damage or failure of the CCW system. Seal cooling should instead be restored by cooling the RCS, which will reduce the temperature of the water flowing through the pump seals.

- A) The following are prerequisites for starting an RCP:
  - o RCP oil lift pump running (~2 minutes) (MCC E)
  - o RCP oil lift pressure white light - LIT
- B) In addition, the following conditions should be met prior to starting an RCP:
  - o Both PRZR spray valves closed - DEMAND AT 0%
  - o CCW in service to selected RCP(s) with flow and temperature alarms (A-7, A-15) extinguished.
  - o Selected RCP(s) seal inlet temperature - LESS THAN 135°F
  - o Selected RCP(s) motor bearing temperatures - LESS THAN 200°F (PPCS Group Display RCPS or use recorder, if selected)
  - o Selected RCP(s) seal injection in service
    - o Seal injection flow - GREATER THAN 6 GPM
    - o Labyrinth seal D/P - GREATER THAN 15 INCHES OF WATER
  - o Selected RCP(s) #1 seal D/P - GREATER THAN 220 PSID
  - o Selected RCP(s) oil levels:
    - o Level alarms (A-24, A-32) - EXTINGUISHED
    - o Level indicators - ON SCALE
  - o Selected RCP(s) seal return alignment:
    - a) RCP #1 seal outlet valve(s) open:
      - o AOV-270A for RCP A
      - o AOV-270B for RCP B
    - b) IF MOV-313, seal return isolation, open, THEN verify the following:
      - o VCT pressure - GREATER THAN 15 PSIG
      - o Selected RCP(s) #1 seal leakoff flow - WITHIN THE NORMAL OPERATING RANGE OF FIGURE RCP SEAL LEAKOFF
      - o Selected RCP(s) standpipe low level alarm (B-11, B-12) - EXTINGUISHED



EOP: ATT-15.0	TITLE: ATTACHMENT RCP START	REV: 8 PAGE 2 of 3
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- c) IF MOV-313 closed, THEN verify other RCP #1 seal parameters normal for selected RCP(s):
- o RCP #1 seal inlet temperature - LESS THAN 135°F
  - o RCP #1 seal D/P - GREATER THAN 220 PSID

NOTE: RCP oil lift pump should be stopped after RCP is running.

FIGURE RCP SEAL LEAKOFF

#1 SEAL LEAK RATE (GPM)

