1503 Lake Road Ontario, New York 14519-9364 585.771.3000

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November 17, 2004

U.S. Nuclear Regulatory Commission Document Control Desk Washington, D.C. 20555

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

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,

Thomas A. Marlow

Thomas A. Marlow

TAM/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):

ATT Index	E-2, Rev 12
F Index	E-3, Rev 38
E Index	ECA-0.0, Rev 29
ECA Index	ECA-0.1, Rev 24
ES Index	ECA-0.2, Rev 16
FR Index	ECA-1.1, Rev 23
ATT-22.0, Rev 4	ECA-2.1, Rev 28
F-0.3, Rev 4	ECA-3.1, Rev 27
E-0, Rev 37	ECA-3.2, Rev 28
E-1, Rev 30	ECA-3.3, Rev 31

ES-0.1, Rev 23 ES-0.3, Rev 10 ES-1.1, Rev 27 ES-1.2, Rev 27 ES-1.3, Rev 27 ES-3.1, Rev 16 ES-3.2, Rev 17 FR-C.1, Rev 21 FR-C.2, Rev 19 FR-H.1, Rev 31 FR-H.3, Rev 8 FR-H.5, Rev 10 FR-I.2, Rev 12 FR-I.3, Rev 20 FR-P.1, Rev 29 FR-P.2, Rev 9 FR-S.1, Rev 17

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NPSP0200 E66429		Ginna Nuclear Power Plant PROCEDURE INDE>			Wed 1	1/17/2004 8:30 Page):05 an 1 of 2	
INPUT PARAMET	ERS: TYPE: PRATT	STATUS VALUE(S): EF, QU	****	5 YEARS ON	LY:			
PRÁTT	EOP ATTACHMENTS	, yy en	**************************************	******				
PROCEDURE NUMBER	PROCEDURE TITLE		REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST	
ATT-1.0	ATTACHMENT AT POWER CCV		003	02/12/2003	02/12/2003	02/12/2008	F	
ATT-1.1	ATTACHMENT NORMAL CCW	FLOW	000	05/18/2000	05/18/2000	05/18/2005	F	
ATT-2.1	ATTACHMENT MIN SW		005	02/01/2001	02/03/2003	02/03/2008	F	
ATT-2.2	ATTACHMENT SW ISOLATION		008	03/06/2002	03/27/2003	03/27/2008	F	
ATT-2.3	ATTACHMENT SW LOADS IN C	NMT	004	03/06/2002	04/06/2004	04/06/2009	F	
ATT-2.4	ATTACHMENT NO SW PUMPS		002	05/30/2003	10/31/2001	10/31/2006	F	
ATT-2.5	ATTACHMENT SPLIT SW HEAD	DERS	000	06/26/2002	06/26/2002	06/26/2007	F	
ATT-3.0	ATTACHMENT CI/CVI		007	02/17/2004	02/17/2004	02/17/2009	F	
ATT-3.1	ATTACHMENT CNMT CLOSURE	1	005	02/17/2004	, 02/17/2004	02/17/2009	F	
ATT-4.0	ATTACHMENT CNMT RECIRC F	ANS	003	07/26/1994	03/27/2003	03/27/2008	F	
ATT-5.0	ATTACHMENT COND TO S/G		006	10/10/2003	04/06/2004	04/06/2009	æ	
ATT-5.1	ATTACHMENT SAFW		008	05/30/2002	04/06/2004	04/06/2009	æ	
ATT-5.2	ATTACHMENT FIRE WATER CO	DOLING TO TDAFW PUMP	004	10/07/2004	8//20/51/2	01/28/2009	æ	
ATT-6.0	ATTACHMENT COND VACUUM	l	003	12/18/1996	02/03/2003	02/03/2008	F	
ATT-7.0	ATTACHMENT CR EVAC		. 006	03/06/2002	02/03/2003	02/03/2008	F	
ATT-8.0	ATTACHMENT DC LOADS		007	02/04/2004	02/04/2004	02/04/2009	F	
ATT-8.1	ATTACHMENT D/G STOP		005	03/06/2002	02/03/2003	02/03/2008	F	
ATT-8.2	ATTACHMENT GEN DEGAS		008	06/20/2002	05/28/2004	05/28/2009	, F	
ATT-8.3	ATTACHMENT NONVITAL		004	03/06/2002	02/03/2003	02/03/2008	æ	
ATT-8.4	ATTACHMENT SIUV	· ·	005	03/06/2002	02/03/2003	02/03/2008	æ	
ATT-8.5	ATTACHMENT LOSS OF OFFSI	TE POWER	001	08/26/2003	05/02/2002	05/02/2007	F	
ATT-9.0	ATTACHMENT LETDOWN	·	009	01/07/2004	03/06/2002	03/06/2007	F	
ATT-9.1	ATTACHMENT EXCESS L/D		006	07/28/2004	10/31/2001	10/31/2008	F	
ATT-10.0	ATTACHMENT FAULTED S/G		006	03/06/2002	03/27/2003	03/27/2008	F	
ATT-11.0	ATTACHMENT IA CONCERNS		004	09/01/2004	03/27/2003	03/27/2008	æ	
ATT-11.1	ATTACHMENT IA SUPPLY		003	03/06/2002	03/27/2003	03/27/2008	æ	
ATT-11.2	ATTACHMENT DIESEL AIR COM	MPRESSOR	004	11/18/2002	03/10/2003	03/10/2008	æ	
ATT-12.0	ATTACHMENT N2 PORVS		005	02/12/2003	02/12/2003	02/12/2008	æ	
ATT-13.0	ATTACHMENT NC		003	02/12/2003	02/12/2003	02/12/2008	F	
ATT-14.0	ATTACHMENT NORMAL RHR (COOLING	003	03/06/2002	04/06/2004	04/06/2009	F	

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NPSP0200		Ginna Nuclear Power Plant			Wed 1	1/17/2004 8:30	
E66429		PROCEDURE INDE>				Page	∋ 2 of ∶
INPUT PARAMET	TERS: TYPE: PRATT	STATUS VALUE(S) : EF, QU		5 YEARS ON	LY:		
PRATT	EOP ATTACHMENTS			i hay nay saya kasal karaya ka ga saya			
PROCEDURE	PROCEDURE TITLE	······································	REV	EFFECT	LAST REVIEW	NEXT	ST
ATT-14.1	ATTACHMENT RHR COOL		007	09/01/2004	01/08/2002	01/08/2007	F
ATT-14.2	ATTACHMENT RHR ISOL		003	02/12/2003	02/12/2003	02/12/2008	æ
ATT-14.3	ATTACHMENT RHR NPSH		003	03/06/2002	01/28/2004	01/28/2009	F
ATT-14.5	ATTACHMENT RHR SYSTEM		003	03/20/2003	02/03/2003	02/03/2008	æ
ATT-14.6	ATTACHMENT RHR PRESS REDUCT	ON	002	03/06/2002	01/28/2004	01/28/2009	æ
ATT-14.7	ATTACHMENT ADJUST RHR FLOW		000	02/17/2004	02/17/2004	02/17/2009	F
ATT-15.0	ATTACHMENT RCP START		009	03/06/2002	03/17/2000	03/17/2005	F
ATT-15.1	ATTACHMENT RCP DIAGNOSTICS		003	04/24/1997	02/03/2003	02/03/2008	Æ
ATT-15.2	ATTACHMENT SEAL COOLING		005	03/06/2002	02/03/2003 ,	02/03/2008	F
ATT-16.0	ATTACHMENT RUPTURED S/G		012	04/29/2004	01/11/2000	01/11/2005	æ
ATT-16.1	ATTACHMENT SGTL		003	09/01/2004	09/08/2000 ·	09/08/2005	F
ATT-18.2	ATTACHMENT RCS BORON FOR SO	m	003	11/26/2003	09/08/2000	09/08/2005	æ
ATT-17.0	ATTACHMENT SD-1		017	09/01/2004	02/29/2000	02/28/2005	æ
ATT-17.1	ATTACHMENT SD-2		007	09/01/2004	01/30/2001	01/30/2006	æ
ATT-18.0	ATTACHMENT SFP - RWST		. 005	03/06/2002	02/03/2003	02/03/2008	æ
ATT-20.0	ATTACHMENT VENT TIME		004	09/01/2004	02/03/2003	02/03/2008	æ
ATT-21.0	ATTACHMENT RCS ISOLATION		002	03/06/2002	02/03/2003	02/03/2008	F
ATT-22.0	ATTACHMENT RESTORING FEED FL	ow	004	11/17/2004	01/22/2002	01/22/2007	F
ATT-23.0	ATTACHMENT TRANSFER 4160V LO	DADS	000	02/26/1999	01/28/2004	01/28/2009	F
ATT-24.0	ATTACHMENT TRANSFER BATTERY	TO TSC	000	09/08/2000	09/08/2000	09/08/2005	Ŧ
ATT-26.0	ATTACHMENT RETURN TO NORMAL	OPERATIONS	000	10/31/2001	10/31/2001	10/31/2006	æ

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NPSP0200 E66429		Ginna Nuclear Power Plant PROCEDURE INDE>			Wed ?	11/17/2004 8:30 Page	0:20 am 9 1 of 1
INPUT PARAM	ETERS: TYPE: PRF	STATUS VALUE(S): EF. QU	********	5 YEARS ON	LY:		
PRF	CRITICAL SAFETY FUNCTION STAT	US PROC					
PROCEDURE NUMBER	PROCEDURE TITLE		REV	EFFECT	LAST REVIEW	NEXT REVIEW	ST
F-0.1	SUBCRITICALITY CSFST		001	07/21/1989	02/25/2004	02/25/2009	F
F-0.2	CORE COOLING CSFST		005	04/20/2004	04/20/2004	04/20/2009	Ŧ
F-0.3	HEAT SINK CSFST		004	11/17/2004	02/25/2004	02/25/2009	F
F-0.4	INTEGRITY CSFST		002	03/31/2000	02/25/2004	02/25/2009	æ
F-0.5	CONTAINMENT CSFST		002	01/12/1990	02/25/2004	02/25/2009	æ
F-0.6	INVENTORY CSFST		004	05/01/1998	03/27/2003	03/27/2008	F
PRF	TOTAL: 6					······································	

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NPSP0200 E66429		Ginna Nuclear Power Plant PROCEDURE INDE>			Wed 1	11/17/2004 8:30 Page):38 ai 1 of
INPUT PARAMETE	ERS: TYPE: PRE	STATUS VALUE(S) : EF, QU	67 C 47 P (2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	5 YEARS ON	LY:		
PRE	EMERGENCY PROCEDURE	n tha ann an tha an tha ann an tha ann an tha ann ann an tha ann an tha ann an tha ann an tha an tha an tha an An tha ann an tha an tha ann an tha an tha an tha an tha	194 - Di <u>n St.</u> 4473 N.C. 19475				
PROCEDURE	PROCEDURE TITLE		REV	EFFECT	LAST	NEXT REVIEW	ST
E-0	REACTOR TRIP OR SAFETY INJECTION		037	11/17/2004	03/24/2003	03/24/2008	F
E-1	LOSS OF REACTOR OR SECONDARY COO	LANT	030	11/17/2004	03/24/2003	03/24/2008	Ŧ
E-2	FAULTED STEAM GENERATOR ISOLATION		012	11/17/2004	03/24/2003	03/24/2008	Æ
E-3	STEAM GENERATOR TUBE RUPTURE		038	11/17/2004	03/24/2003	03/24/2008	FF

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NPSP0200				Wed 1	1/17/2004 8:36	3:50 ar		
E66429	PROCEDURE INDEX						Page	1 of
NPUT PARAMET		PRECA	STATUS VALUE(S): EF, QU		5 YEARS ON	LY:		
PRECA	EMERGENC	Y CONTINGEN	CY ACTIONS PROC	1				
PROCEDURE NUMBER	PROCE	DURE TITLE		REV_	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ECA-0.0	LOSS C	FALL AC POWER		029	11/17/2004	03/24/2003	03/24/2008	F
ECA-0.1	LOSS O	FALL AC POWER R	ECOVERY WITHOUT SI REQUIRED	024	11/17/2004	03/24/2003	03/24/2008	F
ECA-0.2	LOSS O	FALL AC POWER R	ECOVERY WITH SI REQUIRED	016	11/17/2004	03/24/2003	03/24/2008	æ
ECA-1.1	LOSS O	F EMERGENCY CO	DLANT RECIRCULATION	023	11/17/2004	03/24/2003	03/24/2008	F
ECA-1.2	LOCA O	UTSIDE CONTAINM	ENT	006	05/30/2003	03/24/2003	03/24/2008	F
ECA-2.1	UNCON	TROLLED DEPRESS	URIZATION OF BOTH STEAM GENERATORS	028	11/17/2004	03/24/2003	03/24/2008	æ
ECA-3.1	SGTR V	VITH LOSS OF READ	TOR COOLANT SUBCOOLED RECOVERY DESIRED	027	11/17/2004	03/24/2003	03/24/2008	F
ECA-3.2	SGTR V	WITH LOSS OF READ	TOR COOLANT SATURATED RECOVERY DESIRED	028	11/17/2004	03/24/2003	03/24/2008	æ
ECA-3.3	SCIRV	UTHOLIT PRESSURI	ZER PRESSURE CONTROL	031	11/17/2004	03/24/2003	03/24/2008	F

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NPSP0200 E66429		Ginna Nuclear Power Plant PROCEDURE INDE>			wed	1/17/2004 8:36 Page	• 1 of 1
INPUT PARAMET		STATUS VALUE(S): EF, QU		5 YEARS ON	LY:		
PRES	EQUIPMENT SUB-PROCEDURE	alanda dan karakan karaka karakan da karakan da manan dan karakan da karakan da karakan da karakan da karakan Anang karakan karakan karakan da ka					
PROCEDURE	PROCEDURE TITLE		REV_	EFFECT	LAST	NEXT REVIEW	ST
ES-0.0	REDIAGNOSIS		010	05/01/1998	03/24/2003	03/24/2008	F
ES-0.1	REACTOR TRIP RESPONSE		023	11/17/2004	03/24/2003	03/24/2008	F
ES-0.2	NATURAL CIRCULATION COOLDOWN	N	013	05/30/2003	03/24/2003	03/24/2008	æ
ES-0.3	NATURAL CIRCULATION COOLDOWN	N WITH STEAM VOID IN VESSEL	010	11/17/2004	03/24/2003	03/24/2008	æ
ES-1.1	SI TERMINATION		027	11/17/2004	03/24/2003	03/24/2008	æ
ES-1.2	POST LOCA COOLDOWN AND DEPR	ESSURIZATION	027	11/17/2004	03/24/2003	03/24/2008	æ
ES-1.3	TRANSFER TO COLD LEG RECIRCUL	ATION	037	11/17/2004	03/24/2003	03/24/2008	ਸ
ES-3.1	POST-SGTR COOLDOWN USING BA	CKFILL	016	11/17/2004	03/24/2003	03/24/2008	æ
ES-3.2	POST-SGTR COOLDOWN USING BLC	WDOWN	017	11/17/2004	03/24/2003	03/24/2008	F
ES-3.3	POST-SGTR COOLDOWN USING STE	AM DUMP	017	11/17/2004	03/24/2003	03/24/2008	· FF

NPSP0200		Ginna Nuclear Power Plant			Wed 1	1/17/2004 8:37	7:05 am
E66429		PROCEDURE INDE>		Page			1 of 1
INPUT PARAMET	TERS: TYPE: PRFR	STATUS VALUE(S): EF, QU		5 YEARS ON	LY:		
PRFR	FUNCTIONAL RESTORATION G	UIDELINE PROC					C. C
PROCEDURE	PROCEDURE TITLE	······	REV	EFFECT	LAST REVIEW	NEXT REVIEW	ST
FR-C.1	RESPONSE TO INADEQUATE COP	RECOOLING	021	11/17/2004	03/24/2003	03/24/2008	F
FR-C.2	RESPONSE TO DEGRADED CORE	COOLING	019	11/17/2004	03/24/2003	03/24/2008	F
FR-C.3	RESPONSE TO SATURATED COR	ECOOLING	009	05/30/2003	03/24/2003	03/24/2008	F
FR-H.1	RESPONSE TO LOSS OF SECON	DARY HEAT SINK	031	11/17/2004	03/24/2003	03/24/2008	F
FR-H.2	RESPONSE TO STEAM GENERAT	OR OVERPRESSURE	006	10/10/2003	03/24/2003	03/24/2008	F
FR-H.3	RESPONSE TO STEAM GENERAT	OR HIGH LEVE.	008	11/17/2004	03/24/2003	03/24/2008	Æ
FR-H.4	RESPONSE TO LOSS OF NORMA	L STEAM RELEASE CAPABILITIES	005	05/30/2003	03/24/2003	03/24/2008	F
FR-H.5	RESPONSE TO STEAM GENERAT	OR LOW LEVEL	010	11/17/2004	03/24/2003	03/24/2008	æ
FR-I.1	RESPONSE TO HIGH PRESSURIZE	ER LEVEL	017	01/07/2004	03/24/2003	03/24/2008	F
FR-1.2	RESPONSE TO LOW PRESSURIZE	R LEVEL	012	11/17/2004	03/24/2003	03/24/2008	æ
FR-1.3	RESPONSE TO VOIDS IN REACTO	DR VESSEL	020	11/17/2004	03/24/2003 ·	03/24/2008	F
FR-P.1	RESPONSE TO IMMINENT PRESS	JRIZED THERMAL SHOCK CONDITION	029	11/17/2004	03/24/2003	03/24/2008	F
FR-P.2	RESPONSE TO ANTICIPATED PRE	SSURIZED THERMAL SHOCK CONDITION	009	11/17/2004	03/24/2003	03/24/2008	F
FR-S.1	RESPONSE TO REACTOR RESTA	RT/ATWS	017	11/17/2004	03/24/2003	03/24/2008	æ
FR-S.2	RESPONSE TO LOSS OF CORE S	HUTDOWN	° 009	05/30/2003	03/24/2003	03/24/2008	F
FR-Z.1	RESPONSE TO HIGH CONTAINME	NT PRESSURE	008	10/10/2003	03/24/2003	03/24/2008	F
FR-Z.2	RESPONSE TO CONTAINMENT FL	OODING	005	05/30/2003	03/24/2003	03/24/2008	æ
FR-Z.3	RESPONSE TO HIGH CONTAINME	INT RADIATION LEVEL	005	05/30/2003	03/24/2003	03/24/2008	Æ
PRFR	TOTAL: 18						

EOP:	TITLE:		REV: 4
ATT-22.0		ATTACHMENT RESTORING FEED FLOW	
			PAGE 1 of 3

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

controlled copy number $\underline{-23}$

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

ĺ	EOP:
	ATT-22.0

TITLE:

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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* * *	CAUTI	* * * <u>*</u> * * * * * * * * * * * * * * *
FFFD	·	PREVENT EXCESSIVE RCS COOLDOWN AND
	IATED RCS PRESSURE AND INVENTORY R	
* * *		
<u>NOTE</u> :	o This attachment provides the d feed flow to a S/G during FR-H	esired feed flow rate when restoring .1.
	 IF feedwater is restored via m following may be used to indic 	
	o S/G feedwater flow meters (MCB)
	o S/G feedwater flow recorders (MCB)
	o S/G feedwater flow (PPCS Point	ID F0466, F0467, F0476, F0477)
	o S/G feedwater RTD temperature	decrease (PPCS Point ID T2096, T2097)
1 In	itiate Feed flow as follows:	
а.	Bleed and Feed initiated or required	a. <u>IF</u> feedwater flow to affected S/G greater than 50 gpm <u>OR</u> affected SG level greater than 50 inches (100 inches adverse CNMT). <u>THEN</u> fill as desired to restore narrow range greater than 7% (25% adverse CNMT) and go to step 2 of this attachment.
	·	<u>IF NOT. THEN</u> establish less than or equal to 100 gpm feed flow to affected S/G. <u>WHEN</u> S/G level greater than 50 inches (100 inches adverse CNMT). <u>THEN</u> fill as desired to restore narrow range greater than 7% (25% adverse CNMT) and go to step 2 of this attachment.
ь.	Check RCS temp stable or decreasing	b. Fill <u>ONE</u> S/G at the highest possible flow rate and go to step 2 of this attachment.
c.	Establish less than or equal to 100 gpm feed flow to affected S/G. WHEN S/G level greater than 50 inches (100 inches adverse CNMT), THEN fill as desired to restore narrow range greater than 7% (25% adverse CNMT)	

EOP:	TITLE:				
ATT-22.0		ATTACHMENT	RESTORING	FEED	FLOW

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PAGE 3 of 3

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2 Check RCS Loop Hot Legs - BOTH HOT LEG TEMPERATURES DECREASING	Return to step 1 of this attachment.
3 Verify affected S/G is not faulted or ruptured.	Return to step 1 of this attachment and attempt to establish the intact S/G as heat sink. Isolate feedwater and steam flow path to/from affected S/G.
	<u>IF</u> neither S/G is intact, <u>THEN</u> establish a heat sink using the best available S/G.
	-END-

	EOP:	TITLE:		
. 1	F-0.3		HEAT SINK	REV: 4
Í				PAGE 1 of 2

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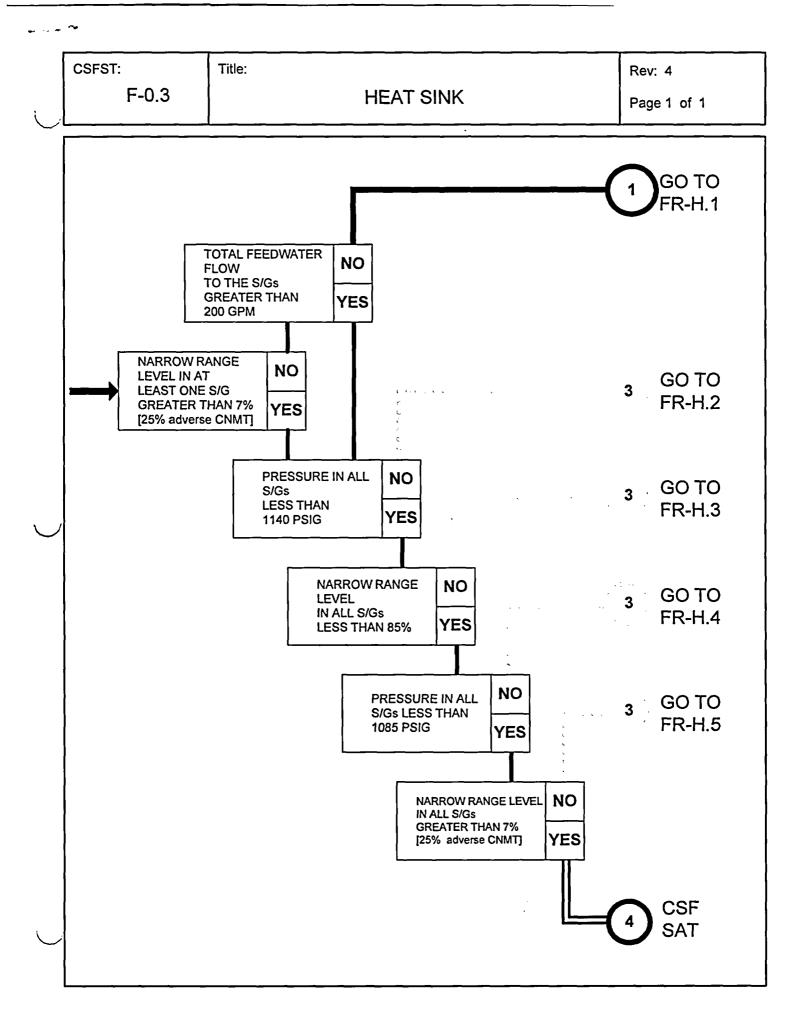
GINNA STATION CONTROLLED COPY NUMBER ________

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____



EOP:	TINE:			. .	REV: 37
E-0		REACTOR TR	IP OR SAFET	Y INJECTION	DICE 1 of 2
		_ 、			PAGE 1 of 2

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GINNA STATION CONTROLLED COPY NUMBER _______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

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EOP: E-O	TITLE: REACTOR TRIP OR SAFETY INJECTION	REV: 37
		PAGE 2 of 29

A. PURPOSE - This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection and to assess plant conditions, and identify the appropriate recovery procedure.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. The following are symptoms that require a reactor trip, if one has not occurred:
 - Any plant parameter reaches a reactor trip setpoint and logic as listed in procedure P-1, REACTOR CONTROL AND PROTECTION SYSTEM.
 - o Operator discretion.
- 2. The following are symptoms of a reactor trip:
 - o Any First Out reactor trip annunciator lit.
 - A rapid decrease in core neutron level as indicated by nuclear instrumentation.
 - o MRPI indicates all control and shutdown rods on bottom.
 - o Reactor trip breakers indicate open.
- 3. The following are symptoms that require a reactor trip and safety injection, if one has not occurred:
 - Any plant parameter reaches the Safety Injection setpoint and logic listed in procedure P-1, REACTOR CONTROL AND PROTECTION SYSTEM.
 - o Operator discretion.
- 4. The following are symptoms of a reactor trip and safety injection:
 - o Any SI annunciator lit.
 - o Safeguards sequencing started.

PAGE 3 of 3 OT OBTAINED ip reactor. trip breakers <u>NOT</u> open. n the following: 13 and Bus 15 normal akers. od drive MG sets tripped. s 13 and Bus 15 normal akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u> NIS indicates greater
ip reactor. trip breakers <u>NOT</u> open. n the following: 13 and Bus 15 normal akers. od drive MG sets tripped. s 13 and Bus 15 normal akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u>
trip breakers <u>NOT</u> open. n the following: 13 and Bus 15 normal akers. od drive MG sets tripped. s 13 and Bus 15 normal akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u>
trip breakers <u>NOT</u> open. n the following: 13 and Bus 15 normal akers. od drive MG sets tripped. s 13 and Bus 15 normal akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u>
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s 13 and Bus 15 normal akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u>
akers. ghting breakers. tor will <u>NOT</u> trip <u>OR IF</u>
tor will <u>NOT</u> trip <u>OR</u> <u>IF</u>
EN go to FR-S.1, REACTOR RESTART/ATWS.
ip turbine.
trip can <u>NOT</u> be <u>HFM</u> close both MSIVs.
start any failed /G to restore power to gency busses.
<u>ND</u> Bus 16 are , <u>THEN</u> go to ECA-0.0, AC POWER, Step 1.

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EOP: E-0		REACTOR	TRIP OF	R SAFETY		N	REV: PAGE	29
STEP A	ACTION/EX	PECTED RESP	ONSE	RE	SPONSE NOT	OBTAINED		

Check if SI is Actuated:

a. Any SI Annunciator - LIT

- a. <u>IF</u> any of the following conditions are met. <u>THEN</u> manually actuate SI and CI:
 - PRZR pressure less than 1750 psig

-OR-

Steamline pressure less than
 514 psig

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-OR-

o CNMT pressure greater than
4 psig

-OR-

o SI sequencing started

-OR-

o Operator determines SI required

IF SI is <u>NOT</u> required. <u>THEN</u> go to ES-0.1, REACTOR TRIP RESPONSE. Step 1.

b. Manually actuate SI and CI.

b. SI sequencing - BOTH TRAINS STARTED.

E-0 REACTOR TRIP OR	SAFETY INJECTION 2.000 REV: 37 PAGE 5 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : o FOLDOUT page should be open an	d monitored periodically.
o Adverse CNMT values should be greater than 4 psig or CNMT ra	used whenever CNMT pressure is diation is greater than 10 ⁺⁰⁵ R/hr.
5 Verify SI and RHR Pumps Running:	
a. All SI pumps – RUNNING	a. Perform the following:
	 Ensure SI pump suction supply open from RWST.
	2) Manually start pumps.
b. Both RHR pumps - RUNNING	b. Manually start pumps.
6 Verify CNMT RECIRC Fans Running:	
a. All fans – RUNNING	a. Manually start fans.
b. Charcoal filter dampers green status lights - EXTINGUISHED	b. Dispatch personnel to relay room with relay rack key to locally open dampers by pushing in trip relay plungers.
	 AUX RELAY RACK RA-2 for fan A AUX RELAY RACK RA-3 for fan C

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7 Verify CNMT Spray Not	- Vanifa CNVT space initiated
Required: • Annunciator A-27. CNMT SPRAY - EXTINGUISHED • CNMT pressure - LESS THAN 28 PSIG	 Verify CNMT spray initiated. IF CNMT spray NOT initiated. THEN perform the following: a. Depress manual CNMT spray pushbuttons (2 of 2). b. Ensure CNMT spray pumps running. IF no CNMT spray pump available. THEN go to Step 8. c. Ensure CNMT spray pump discharge valves open for operating pump(s). o CNMT spray pump A: MOV-860A MOV-860B o CNMT spray pump B: MOV-860D d. Verify NaOH flow (FI-930) IF NaOH flow NOT indicated. THEN place switches for NaOH tank outlet valves to OPEN. AOV-836A AOV-836B

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TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Check If Main Steamlines Should Be Isolated:	•
a. Any MSIV – OPEN	a. Go to Step 9.
b. Check CNMT pressure – LESS THAN 18 PSIG	b. Ensure BOTH MSIVs closed and go to Step 9.
c. Check if ANY main steamlines should be isolated:	c. Go to Step 9.
o Low Tavg (545°F) AND high steam flow (0.4x10 ⁶ lb/hr) from either S/G	
-OR	
o High-High steam flow (3.6x10 ⁶ lb/hr) from either S/G	
d. Verify MSIV closed on the affected S/G(s)	d. Manually close valves.
9 Verify MFW Isolation:	
a. MFW pumps – TRIPPED	a. Perform the following:.
	 Manually close MFW pump discharge valves and trip MFW pumps.
	2) Continue with Step 9c. <u>WHEN</u> both MFPs are tripped, <u>THEN</u> perform Step 9b.
b. Depress MANUAL pushbuttons for A and B S/G MFW regulating valve and bypass valve controllers <u>AND</u> adjust to 0% demand.	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 Verify Both MDAFW Pumps Running	Manually start both MDAFW pumps. <u>IF</u> less than 2 MDAFW pumps are
	running, <u>THEN</u> manually open TDAFW pump steam supply valves.
	• MOV-3505A • MOV-3504A
11 Verify At Least Two SW Pumps - RUNNING	Perform the following:
	a. Ensure one SW pump running on each energized screenhouse AC emergency bus:
	• Eus 17 • Bus 18
	b. <u>IF</u> offsite power <u>NOT</u> available, <u>THEN</u> ensure SW isolation.
	c. <u>IF NO</u> SW pumps running; <u>THEN</u> perform the following:
	 Pull stop any D/G that is N<u>OT</u> supplied by alternate cooling <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.

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	And the second	FAGE	5 01	29

Verify CI And CVI:	
a. CI and CVI annunciators - LIT	a. Depress manual CI pushbutton.
 Annunciator A-26, CNMT ISOLATION Annunciator A-25, CNMT VENTILATION ISOLATION 	
b. Verify CI and CVI valve status lights - BRIGHT	b. Manually close affected CI and CVI valve(s).
	. <u>IF</u> valve(s) can <u>NOT</u> be closed from the MCB, <u>THEN</u> dispatch AO to locally close affected valve(s)
	<u>IF</u> valve(s) can <u>NOT</u> be locally closed. <u>THEN</u> close alternate isolation valve(s). (Refer to ATT-3.0, ATTACHMENT CI/CVI).
c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT	c. Dispatch AO to locally fail op valves.
FCV-4561FCV-4562	
d. Letdown orifice valves - CLOSEDAOV-200A	d. Place affected valve switch to CLOSE. <u>IF</u> valves can <u>NOT</u> be verified closed by MCB
• AOV-200B • AOV-202	indication, <u>THEN</u> close alterna isolations. (Refer to ATT-3.0 ATTACHMENT CI/CVI)

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CAUTION CAUTION RCP TRIP CRITERIA LISTED ON FOLDOUT PAGE SHOULD BE MONITORED PERIODICALLY. 13 Check CCW System Status: a. Verify CCW pump - AT LEAST ONE a. IF offsite power available. THEN RUNNING b. Place switch for excess letdown AOV-310 to CLOSE c. Place switch for CCW from excess letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. IF RCS pressure less than 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - LESS THAN 230 GFM	STEP ACTION/H	EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 13 Check CCW System Status: a. Verify CCW pump - AT LEAST ONE RUNNING b. Place switch for excess letdown AOV-310 to CLOSE c. Place switch for CCW from excess letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW c. FIEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW c. THEN go to Step 15. b. TIF RCS pressure less than 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. TIF RCS pressure less than 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15.			<u> </u>
 13 Check CCW System Status: a. Verify CCW pump - AT LEAST ONE RUNNING b. Place switch for excess letdown AOV-310 to CLOSE c. Place switch for CCW from excess letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW c. FIEN go to Step 15. b. THEN flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW c. THEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW c. THEN go to Step 15. b. The flow indicator - CHECK FOR FLOW b. AFW flow - INDICATED TO BOTH S/G(c) b. AFW flow from each MDAFW pump -	RCP TRIP CRITERI	A LISTED ON FOLDOUT PAGE	E SHOULD BE MONITORED PERIODICALLY.
 a. Verify CCW pump - AT LEAST ONE RUNNING b. Place switch for excess letdown AOV-310 to CLOSE c. Place switch for CCW from excess letdown, AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. THEN go to Step 15. c. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: a. AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - 	* * * * * * * * *	* * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
 a. Verify CCW pump - AT LEAST ONE RUNNING b. Place switch for excess letdown AOV-310 to CLOSE c. Place switch for CCW from excess letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. THEN go to Step 15. c. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: a. AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - 			
RUNNING manually start one CCW pump. b. Place switch for excess letdown AOV-310 to CLOSE manually start one CCW pump. c. Place switch for CCW from excess letdown. AOV-745 to CLOSE a. IF RCS pressure less than 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: Manually align valves as necessary. a. AFW flow - INDICATED TO BOTH S/G(z) Manually align valves as necessary. b. AFW flow from each MDAFW pump - Manually align valves as necessary.	13 Check CCW S	ystem Status:	
AOV-310 to CLOSE c. Place switch for CCW from excess letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW 15 Verify AFW Valve Alignment: a. AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump -		pump - AT LEAST ONE	
 letdown. AOV-745 to CLOSE 14 Verify SI And RHR Pump Flow: a. SI flow indicators - CHECK FOR FLOW b. RHR flow indicator - CHECK FOR FLOW c. IF RCS pressure less than 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. RHR flow indicator - CHECK FOR 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: a. AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - 			
 a. SI flow indicators - CHECK FOR FLOW a. <u>IF</u> RCS pressure less than 1400 psig. <u>THEN</u> manually start pumps and align valves. <u>IF NOT</u>. <u>THEN</u> go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. <u>IF</u> RCS pressure less than 140 psig. <u>THEN</u> manually start pumps and align valves. <u>IF NOT</u>. <u>THEN</u> go to Step 15. 15 Verify AFW Valve Alignment: a. AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - 			
 FLOW FLOW 1400 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. b. RHR flow indicator - CHECK FOR FLOW b. IF RCS pressure less than 140 psig. THEN manually start pumps and align valves. IF NOT. THEN go to Step 15. 15 Verify AFW Valve Alignment: AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump - 	14 Verify SI A	nd RHR Pump Flow:	
FLOW FLOW I40 psig. <u>THEN</u> manually start pumps and align valves. <u>IF NOT</u> . <u>THEN</u> go to Step 15. 15 Verify AFW Valve Alignment: AFW flow - INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump -		dicators – CHECK FOR	1400 psig, <u>THEN</u> manually start pumps and align valves. <u>IF NOT</u> ,
a. AFW flow – INDICATED TO BOTH S/G(s) b. AFW flow from each MDAFW pump –		ndicator – CHECK FOR	140 psig, <u>THEN</u> manually start pumps and align valves. <u>IF NOT</u> ,
S/G(s) b. AFW flow from each MDAFW pump -	15 Verify AFW	Valve Alignment:	Manually align valves as necessary.
		INDICATED TO BOTH	

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	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
a. Cheo GREA	or Heat Sink: ok S/G narrow range leve ATER THAN 7% [25% adverse C] in any S/G		tart o W m can go
BOTH c. Cont S/G 7%	ck S/G narrow range leve H S/G LESS THAN 50% trol feed flow to mainta narrow range level betw [25% adverse CNMT] and 5	level above 50%. n en	with

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17 Verify SI Pump And RHR Pump Emergency Alignment:	
a. RHR pump discharge to Rx vessel deluge - OPEN	a. Ensure at least one valve open.
• MOV-852A • MOV-852B	
b. Verify SI pump C – RUNNING	b. Manually start pump on available bus.
c. Verify SI pump A – RUNNING	c. Perform the following:
	1) Ensure SI pumps B and C . running. <u>IF</u> either pump <u>NOT</u> running, <u>THEN</u> go to Step 17e
	 Ensure SI pump C aligned to discharge line A:
	o MOV-871A open
	o MOV-871B closed
	3) Go to Step 18.
d. Verify SI pump B – RUNNING	d. Perform the following:
	1) Ensure SI pumps A and C running. <u>IF</u> either pump <u>NOT</u> running, <u>THEN</u> go to Step 17e
	2) Ensure SI pump C aligned to discharge line B:
	o MOV-871B open
	o MOV-871A closed
	3) Go to Step 18.
e. Verify SI pump C discharge valves – OPEN	e. Manually open valves as necessary.
• MOV-871A • MOV-871B	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
• • • • • • • • • • • • • • • • • • •	<u>v</u>
IF OFFSITE POWER IS LOST AFTER SI RESET. TO RESTART SAFEGUARDS EQUIPMENT. (REFER OFFSITE POWER)	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
18 Check CCW Flow to RCP Thermal Barriers:	<u>IF</u> CCW to a RCP is lost, <u>THEN</u> perform the following:
o Annunciator A-7, RCP 1A CCW RETURN HI TEMP OR LO FLOW -	a. Stop affected RCPs.
EXTINGUISHED	b. Reset SI.
o Annunciator A-15, RCP 1B CCW RETURN HI TEMP OR LO FLOW - EXTINGUISHED	c. Verify adequate power available to run one charging pump (75 kw).
EXTINGUISHED	d. Start one charging pump at minimum speed for seal injection.
	e. Adjust HCV-142 to establish either of the following:
	o Labyrinth seal D/P to each RCP greater than 15 inches of water.
	- OR -
	o RCP seal injection flow to each RCP greater than 6 gpm.
	f. <u>IF</u> large imbalance in seal injection flow exists. <u>THEN</u> consider local adjustment of V-300A and V-300B.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	eck If TDAFW Pump Can Be	-
а.	Both MDAFW pumps - RUNNING	a. Go to Step 20.
	PULL STOP TDAFW pump steam supply valves	
	• MOV-3504A • MOV-3505A	
	itor RCS Tavg - STABLE AT TRENDING TO 547°F	<u>, IF</u> temperature less than 547°F and decreasing, <u>THEN</u> perform the following:
		a. Stop dumping steam.
		b. Ensure reheater steam supply valves are closed.
		c. <u>IF</u> cooldown continues, <u>THEN</u> control total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
	· · ·	d. <u>WHEN</u> S/G level greater than 7% [25% adverse CNMT] in one S/G. <u>THEN</u> limit feed flow to that required to maintain level in at least one S/G.
		e. <u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.
		<u>IF</u> temperature greater than 547°F and increasing, <u>THEN</u> dump steam to stabilize and slowly decrease temperature to 547°F.

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21 Check PRZR PORVs And Spray Valves:	
a. PORVE - CLOSED	a. <u>IF</u> PRZR pressure less than 2335 psig. <u>THEN</u> manually close PORVs.
	<u>IF</u> any valve can <u>NOT</u> be closed. <u>THEN</u> manually close its block valve.
	 MOV-516 for PCV-430 MOV-515 for PCV-431C
	<u>IF</u> block valve can <u>NOT</u> be closed. <u>THEN</u> go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
b. Auxiliary spray valve (AOV-296) - CLOSED	b. Manually close auxiliary spray valve. <u>IF</u> valve can <u>NOT</u> be closed, <u>THEN</u> perform the following:
	 Decrease charging pump flow to minimum.
	2) Ensure charging valve to loc B cold leg open (AOV-294).
c. Check PRZR pressure – LESS THAN 2260 PSIG	c. Continue with Step 22. <u>WHEN</u> pressure less than 2260 psig. <u>THEN</u> do Step 21d.
d. Normal PRZR spray valves – CLOSED	d. Place controllers in MANUAL at 0% demand. <u>IF</u> valves can <u>NOT</u> b
 PCV-431A PCV-431B 	closed, <u>THEN</u> stop associated RCP(s).

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22 Monitor RCP Trip Criteria:	
a. RCP status - ANY RCP RUNNING	a. Go to Step 23.
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 23.
c. RCS pressure minus maximum S/G pressure – LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 23.
d. Stop both RCPs	
23 Check If S/G Secondary Side Is Intact:	<u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> go
 Pressure in both S/Gs - STABLE OR INCREASING 	to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
o Pressure in both S/Gs – GREATER THAN 110 PSIG	
24 Check If S/G Tubes Are Intact:	Go to E-3, STEAM GENERATOR TUBE
o Air ejector radiation monitors (R-15 or R-15A) - NORMAL	RUPTURE, Step 1.
o S/G blowdown radiation monitor (R-19) - NORMAL	
o' Steamline radiation monitors (R-31 and R-32) - NORMAL	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25 Check If RCS Is Intact: a. CNMT area radiation monitors - NORMAL	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
 R-2 R-7 R-29 R-30 	
b. CNMT pressure – LESS THAN 0.5 PSIG	
c. CNMT sump B level - LESS THAN 8 INCHES	
d. CNMT sump A level	
o Level - STABLE	
o Annunciator C-19, CONTAINMENT SUMP A HI LEVEL - EXTINGUISHED	

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TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6 Check If SI Should Be Terminated:	•
a. RCS pressure: o Pressure – GREATER THAN 1625 PSIG	a. Do <u>NOT</u> stop SI pumps. Go to Step 27.
o Pressure - STABLE OR INCREASING	
b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Do <u>NOT</u> stop SI pumps. Go to Step 27.
c. Secondary heat sink: o Total feed flow to S/Gs - GREATER THAN 200 GPM	c. <u>IF</u> neither condition met, <u>THEN</u> do <u>NOT</u> stop SI pumps. Go to Step 27.
-OR-	
o Narrow range level in at least one S/G - GREATER THAN 7%	
d. PRZR level - GREATER THAN 10%	d. Do <u>NOT</u> stop SI pumps. Perform the following:
	 <u>IF</u> normal PRZR spray available. <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
	2) Go to Step 27.
e. Go to ES-1.1. SI TERMINATION. Step 1.	

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(Refer t	ns should be evaluat o EPIP-1.0, GINNA ST CATION).		ite Contingency Reporting ENT EVALUATION AND	
o The Crit APPENDIX		Red Pat	h Summary is available in	
27 Initiate Mon Critical Saf Status Trees	ety Function			
*28 Monitor S/G	Levels:			
a. Narrow rang THAN 7%	e level - GREATER	a.	Maintain total feed flow gr than 200 gpm until narrow r level greater than 7% in at least one S/G.	ange
	ed flow to maintain ge level between 17%	ь.	<u>IF</u> narrow range level in an continues to increase in an uncontrolled manner. <u>THEN</u> g E-3. STEAM GENERATOR TUBE RUPTURE, Step 1.	n i
29 Check Second Levels - NOF			to E-3, SIEAM GENERATOR TU PTURE, Step 1.	BE .
o Steamline r (R-31 and F	adiation monitor 2-32)			
o Dispatch AC steamline r) to locally check adiation			
o Request RP activity	sample S/Gs for			

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	ED
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CAUTIC	<u>DN</u>	
IF OFFSITE POWER IS LOST AFTER SI RESET. TO RESTART SAFEGUARDS EQUIPMENT. (REFEF OFFSITE POWER)		
* * * * * * * * * * * * * * * * * * * *		******
30 Reset SI		
31 Reset CI:		
a. Depress CI reset pushbutton		
b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the follow	ving:
	1) Reset SI.	
	2) Depress CI res	et pushbutton.
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32 Verify Adequate SW Flow:	-
a. At least three SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each).
	<u>IF</u> less than three pumps running, <u>THEN</u> ensure SW isolation.
	<u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
	 Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	<u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

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m the following: ose non-safeguards bus tie eakers: ous 13 to Bus 14 tie ous 15 to Bus 14 tie dify adequate emergency D/G eacity to run air epressor(s) (75 kw each). <u>NOT, THEN</u> perform the lowing: Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR
-OR- Evaluate if CNMT RECIRC fans should be stopped. (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FAN M bus 15 is restored, <u>THEN</u> set control room lighting. If the following: to step 33d.
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This Step continued on the next page.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 (Step 33 continued-from previous page c. Verify SW isolation valves to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressor(s) - RUNNING 	 c. Perform the following: Manually align valves. Dispatch AO to locally reset compressors as necessary. d. Manually start electric air compressor(s) as power supply permits (75 kw each). <u>IF</u> electric air compressor can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor. (Refer
e. Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	 to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR) e. Perform the following: Continue attempts to restore IA (Refer to AP-IA.1. LOSS OF INSTRUMENT AIR). 2) Continue with Step 34. WHEN IA restored. THEN do Steps 33f and g.
f. Reset both trains of XY relays for IA to CNMT AOV-5392 g. Verify IA to CNMT AOV-5392 - OPEN	

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TITLE:

REACTOR TRIP OR SAFETY INJECTION

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STEP ACTION/EXPECTE	D RESPONSE	RESPONSE NOT OBTAINED
 34 Check Auxiliary F Radiation - NORMA Plant vent iodine Plant vent partice Plant vent gas (R CCW liquid monitos LTD line monitor CHG pump room (R-4) 	AL (R-10B) 11ate (R-13) -14) r (R-17) (R-9)	Evaluate cause of abnormal conditions. <u>IF</u> the cause is a loss of RCS inventory outside CNMT, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.
 35 Check PRT Condit: o PRT level (LI-44) 84% o PRT temperature THAN 120°F o PRT pressure (PI THAN 3 PSIG 	2) - LESS THAN (TI-439) - LESS	Evaluate the following flowpaths for cause of abnormal conditions: • RCP seal return relief • PRZR PORVs • PRZR safeties • Letdown line relief IF excess letdown previously in service. <u>THEN</u> close AOV-310, excess letdown isolation valve from loop A cold.
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EOP:	TILE:	REV: 37
E-0	REACTOR TRIP OR SAFETY INJECTION	PAGE 25 of 29
	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAIN	NED

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-	CAUTION	•	
UNCONTROLLED MANNER		PRESSURE DECREASES IN AN THEN THE RHR PUMPS MUST BE RCS.	
* * * * * * * * * *			*
*36 Monitor If RHR Be Stopped:	Pumps Should		
a. Check RCS pre	ssure:		
1) Pressure – 250 PSIG	GREATER THAN	1) Go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	
2) Pressure – INCREASING		2) Go to Step 37.	
b. Stop both RHR AUTO	pumps and place in		
37 Check Normal F To Charging Pu		Verify adequate emergency D/G capacity to run charging pumps (75 kw each).	
o Bus 14 normal CLOSED	feed breaker –	<u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer	
o Bus 16 normal CLOSED	feed breaker –	to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).	
 37 Check Normal F To Charging Put o Bus 14 normal CLOSED o Bus 16 normal 	mps: feed breaker –	capacity to run charging pumps (75 kw each). <u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer to ATT-4.0. ATTACHMENT CNMT RECIRC	

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-	EOP: E-0 REACTOR TRIP OR S	AFETY INJECTION REV: 37 PAGE 26 of 29
\cup	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	38 Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following:
		 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch A0 to close seal injection needle valve(s) to affected RCP:
		 V-300A for RCP A V-300B for RCP B
		2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST:	b. Manually align valves.
\cup	o LCV-112B - OPEN o LCV-112C - CLOSED	<u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
		<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
		 Direct AO to locally open V-358, manual charging pump suction from RWST (Charging Pump Room).
		2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
		3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	
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EOP: E-0	TITLE: REACTOR	TRIP OR SAF	ETY INJECTION	REV: 37
L			<u>*</u>	PAGE 27 of 2
STEP A	CTION/EXPECTED RESP	ONSE	RESPONSE NOT OBT	ATNED
				AINED
	in PRZR Pressure n 1800 PSIG And SIG	- <u>.</u> 2		
o Rese	t PRZR heaters			
o Use	normal PRZR spray			

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EOP:

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REACTOR TRIP OR SAFETY INJECTION

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40 Check If Emergency D/Gs Should Be Stopped:	•
 a. Verify AC emergency busses energized by offsite power: a. Emergency D/G output breakers orean b. AC emergency bus voltage - GREATER THAN 420 VOLTS b. AC emergency bus normal feed breakers - CLOSED 	 a. Perform the following: Verify non-safeguards bus tie breakers closed: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie Place the following pumps in PULL STOP: EH pumps Turning gear oil pump HF seal oil backup pump 3) Ensure condenser steam dump mode control in MANUAL. 4) Restore power to MCCs: A from Bus 13 B from Bus 13 B from Bus 15 F from Bus 15 F from Bus 15 5) Start HP seal oil backup pump. 6) Ensure D/G load within limits. 7) Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power. 8) Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

EOP: TITLE: E-0 REACTOR TRIP OR SAFETY INJECTION	REV: 37 PAGE 29 of
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAI	
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAI	
41 Return to Step 20	
-END-	
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EOP: TIR	REACTOR TRIP OR SAFETY INJECTION
	PAGE 1 of 1
	E-0 APPENDIX LIST
	- <u>TITLE</u>
1)	RED PATH SUMMARY
2)	FIGURE MIN SUBCOOLING (FIG-1.0)
3)	ATTACHMENT CI/CVI (ATT-3.0)
4)	ATTACHMENT SD-1 (ATT-17.0)
5)	ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
6)	ATTACHMENT D/G STOP (ATT-8.1)
7)	ATTACHMENT SI/UV (ATT-8.4)
8)	ATTACHMENT NO SW PUMPS (ATT-2.4)
9)	ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
10)	ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)

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11) FOLDOUT

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E-0		REACTOR	TRTP	OR SAFETY	INJECTION	REV.	57
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RED PATH SUMMARY

- a. SUBCRITICALITY -- Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F <u>AND</u> RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% |
 [25% adverse CNMT] AND total feedwater flow
 less than 200 gpm
- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

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	E-0		REACTOR	TRIP	OR	SAFETY	INJECTIO	N	PAGE	1 of	1

FOLDOUT PAGE

1. <u>RCP TRIP CRITERIA</u>

IF BOTH conditions listed below occur, THEN trip both RCPs:

- a. SI pumps AT LEAST TWO RUNNING
- b. RCS pressure minus maximum S/G pressure LESS THAN 175 PSIG [400 psig adverse CNMT]

2. LOSS OF SW_CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

3. <u>AFW SUPPLY SWITCHOVER_CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

EOP:	TILE:	REV: 30
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GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP: E-1	LOSS OF REACTOR OR SECONDARY COOLANT	REV: 30
E-1	LOSS OF REACTOR OR SECONDART COOLANT	PAGE 2 of 23

- A. PURPOSE This procedure provides actions to recover from a loss of reactor or secondary coolant.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when a PRZR PORV is stuck open and its block valve can not be closed.
 - b. E-0, REACTOR TRIP OR SAFETY INJECTION, with any of the following symptoms: high containment radiation, high containment pressure, or high containment recirculation sump level.
 - c. E-0, REACTOR TRIP OR SAFETY INJECTION, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when RCS pressure is less than the shutoff head pressure of the RHR pumps or is decreasing.
 - d. ES-1.1, SI TERMINATION, and FR-I.2, RESPONSE TO LOW PRESSURIZER LEVEL, if SI has to be reinitiated.
 - e. E-2, FAULTED STEAM GENERATOR ISOLATION, after identification and isolation of a faulted S/G.
 - f. ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, after normal injection mode conditions are established.
 - g. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment is isolated.
 - h. FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, and FR-C.2, RESPONSE TO DEGRADED CORE COOLING, after core cooling has been reestablished.
 - i. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and all PRZR PORVs are closed.

EOP: TITLE: E-1 LOSS OF REACTOR OR SE	ECONDARY COOLANT	REV: 30 PAGE 3 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
<u>CAUTION</u>	<u>1</u> * * <u>*</u> * * * * * * * * *	* * * * * * * *
IF RWST LEVEL DECREASES TO LESS THAN 28%. ALIGNED FOR COLD LEG RECIRCULATION USING RECIRCULATION, STEP 1.		
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * *
<u>NOTE</u> : o FOLDOUT page should be open AND	monitored periodically.	
o Critical Safety Function Status to Appendix 1 for Red Path Summa		d. (Refer
o Conditions should be evaluated f (Refer to EPIP-1.0, GINNA STATIC CLASSIFICATION).		rting
o Adverse CNMT values should be us greater than 4 psig or CNMT radi		
1 Monitor RCP Trip Criteria:		
a. RCP status - ANY RCP RUNNING	a. Go to Step 2.	
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 2.	
c. RCS pressure minus maximum S/G pressure – LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 2.	
d. Stop both RCPs		

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E-1	LOSS OF REACTOR OR S	SECONDARY COOLANT PAGE 4 of
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Is Int o Pres	If S/G Secondary Side act: ssure in both S/Gs - STABLE NCREASING	<u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:
	ssure in both S/Gs – GREATER N 110 PSIG	SteamlinesFeedlines
		<u>IF NOT. THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
NOTE: TDAI	W pump flow control AOVs may d	drift open on loss of IA.
* 3 Monito	r Intact S/G Levels:	
	cow range level - GREATER 1 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
nari	rol feed flow to maintain row range level between 17% adverse CNMT] and 50%	b. <u>IF</u> narrow range level in any S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	r If Secondary ion Levels Are Normal	<u>IF</u> steamline radiation monitors <u>NOT</u> available, <u>THEN</u> dispatch AO to locally check steamline radiation.
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E-1	LOSS OF REACTOR OR SI	ECONDARY COOLANT	PAGE 5 of
	_ <u></u>		
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	·]
		· · · · · · · · · · · · · · · · · · ·	_
	CAUTIO	<u>N</u>	
	ZR PORV OPENS BECAUSE OF HIGH P SSURE DECREASES TO LESS THAN 233		
AFIER FRE	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * *	/· * * * * * * * *
* 5 Monito	or PRZR PORV Status:		
	er to PORV block valves – ILABLE	a. Restore power to bl unless block valve	
		isolate an open POR	
		 MOV-515, MCC D ро MOV-516, MCC C ро 	
b. POR	Vs - CLOSED	b. <u>IF</u> PRZR pressure le	
		2335 psig, <u>THEN</u> man PORVs.	ually close
		<u>IF</u> any PORV can <u>NOT</u>	
		<u>THEN</u> manually close valve. <u>IF</u> block va	lve can <u>NOT</u>
		be closed, <u>THEN</u> dis locally check break	
		• MOV-515, MCC D po	
		• MOV-516, MCC C po	
C. 510	ck valves - AT LEAST ONE OPEN	c. Open one block valv was closed to isola PORV.	
		FURV.	

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DP: TITLE:	- REV: 30
E-1 LOSS OF REACTOR OR S	SECONDARY COOLANT PAGE 6 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	L
CAUTI	* * * * * * * * * * * * * * * * * * *
IF OFFSITE POWER IS LOST AFTER SI RESET	
TO RESTART SAFEGUARDS EQUIPMENT. (REFE OFFSITE POWER)	R TO ATT-8.5, ATTACHMENT LOSS OF
* * * * * * * * * * * * * * * * * * *	
6 Reset SI	
7 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26, CNMT	b. Perform the following:
ISOLATION - EXTINGUISHED	1) Reset SI.
	2) Depress CI reset pushbutton.
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E-1 LOSS OF REACTOR OR SI	ECONDARY COOLANT PAGE 7 of
· · · · · · · · · · · · · · · · · · ·	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Verify Adequate SW Flow:	-
a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each).
	<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
	1) Ensure SW isolation.
	 <u>IF</u> <u>NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	3) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	- -

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EOP: TITLE: E-1 LOSS OF REACTOR OR S	ECONDARY COOLANT
	PAGE 8 of 23
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Establish IA to CNMT:	·
 a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	 a. Perform the following: 1) Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 14 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <u>IF NOT</u>, <u>THEN</u> perform the following: o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	 DIESEL AIR COMPRESSOR -OR- Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0. ATTACHMENT CNMT RECIRC FANS). 3) WHEN bus 15 restored. THEN reset control room lighting. b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to step 9d.

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This Step continued on the next page.

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LOSS OF REACTOR OR SECONDARY COOLANT

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 (Step 9 continued from previous page) c. Verify turbine building SW isolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressors RUNNING d. Verify adequate air compressors RUNNING d. Verify adequate air compressors RUNNING d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can <u>NO</u> be started, <u>THEN</u> start diesel air compressors (refer to aTT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). e. Check IA supply: Pressure - GREATER THAN 60 PSIG Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 g. Verify IA to CNMT AOV-5392 - OPEN 	TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 isolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 I) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary. d. Verify adequate air compressors - RUNNING d. Verify adequate air compressors - RUNNING d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can MO be started. THEN start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). e. Check IA supply: Pressure - GREATER THAN 60 PSIG Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 1) Manually align valves. 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary. d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). e. Perform the following: Pressure - STABLE OR INCREASING Continue with Step 10. WHEN IA restored, THEN do Steps 9 and g. 	(Step 9 continued from previous page)	-
 o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 2) Continue with Step 10. WHEN IA restored. THEN do Steps 9 and g. 	isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 d. Verify adequate air compressors	 Manually align valves. Dispatch AO to locally reset compressors as necessary. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NO</u> be started. <u>THEN</u> start diesel air compressor (refer to ATT-11.2. ATTACHMENT DIESEL AIR
60 PSIG 0 Pressure - STABLE OR INCREASING 1A (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 2) Continue with Step 10. WHEN IA restored, THEN do Steps 9 and g. 1A (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 2) Continue with Step 10. WHEN IA restored, THEN do Steps 9 and g.	e. Check IA supply:	e. Perform the following:
for IA to CNMT AOV-5392	60 PSIG o Pressure – STABLE OR	IA (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 2) Continue with Step 10. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 9
g. Verify IA to CNMT AOV-5392 - OPEN		-
	g. Verify IA to CNMT AOV-5392 - OPEN	

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LOSS OF REACTOR OR SECONDARY COOLANT

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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10 Check Normal Power Available To Charging Pumps:	capacity to run charging pumps
o Bus 14 normal feed breaker ~ CLOSED	(75 kw each). <u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer
o Bus 16 normal feed breaker – CLOSED	to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11 Check If Charging Flow Has Been Established:	-
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch A0 to close seal injection needle valve(s) to affected RCP:
	 V-300A for RCP A V-300B for RCP B
	 Ensure HCV-142 open, demand at 0%.
b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
o LCV-112B - OPEN	<u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally op
o LCV-112C - CLOSED	V-358, manual charging pump suction from RWST (charging pu room).
	<u>IF</u> LCV-112C can <u>NOT</u> be closed, <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open, <u>THEN</u> direc AO to close V-268 to isolat charging pumps B and C from VCT (charging pump room).

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E-1	LOSS OF REACTOR OR SECONDARY COOLANT	REV: 30
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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	12 Check If SI Should Be Terminated:	-
	a. RCS pressure:	a. Do <u>NOT</u> stop SI pumps. Go to Step 13.
	o Pressure – GREATER THAN 1625 psig [1825 psig adverse CNMT]	
	o Pressure – STABLE OR INCREASING	
:	b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Do <u>NOT</u> stop SI pumps. Go to Step 13.
	c. Secondary heat sink:	c. <u>IF</u> neither condition satisfied, <u>THEN</u> do <u>NOT</u> stop SI pumps. Go
\cup	o Total feed flow to intact S/Gs - GREATER THAN 200 GPM	to Step 13.
	-OR-	
	o Narrow range level in at least one intact S/G - GREATER THAN 7% [25% adverse CNMT]	-
	d. PRZR level – GREATER THAN 10% [30% adverse CNMT]	d. Do <u>NOT</u> stop SI pumps. Perform the following:
		 <u>IF</u> normal PRZR spray available. <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
		2) Go to Step 13.
	e. Go to ES-1.1, SI TERMINATION, Step 1.	
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13 Monitor If CNMT Spray Should	
Be Stopped:	
a. CNMT spray pumps – RUNNING	a. Go to Step 14.
b. Check the following:	b. Continue with Step 14. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u>
o CNMT pressure – LESS THAN 4 PSIG	do Steps 13c through f.
o Sodium hydroxide tank level - LESS THAN 55%	
c. Reset CNMT spray	
d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE.
	AOV-836AAOV-836B
e. Stop CNMT spray pumps and place in AUTO	
f. Close CNMT spray pump discharge valves	
• MOV-860A	
 MOV-860B MOV-860C 	
• MOV-860D	

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		PAGE	14	of	23

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * * * * * * * * * * * * * * * * *	• • • • • • • • • • • • • • • • • • •
 IF OFFSITE POWER IS LOST AFTER SI R REQUIRED TO RESTART SAFEGUARDS EQUI LOSS OF OFFSITE POWER) 	ESET, THEN MANUAL ACTION MAY BE PMENT. (REFER TO ATT-8.5, ATTACHMENT
 RCS PRESSURE SHOULD BE MONITORED. UNCONTROLLED MANNER TO LESS THAN 25 THE RHR PUMPS MUST BE MANUALLY REST 	0 PSIG [465 PSIG ADVERSE CNMT]. THEN
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *
<pre>*14 Monitor If RHR Pumps Should Be Stopped:</pre>	
a. RHR pumps - ANY RUNNING IN INJECTION MODE	a. Go to Step 15.
b. Check RCS pressure:	
1) Pressure – GREATER THAN 250 psig [465 psig adverse CNMT]	1) Go to Step 16.
2) RCS pressure - STABLE OR INCREASING	2) Go to Step 15.
c. Stop RHR pumps and place in AUTO	
15 Check RCS And S/G Pressures	
a. Check pressures in both S/Gs - STABLE OR INCREASING	a. Return to Step 1.
b. Check pressures in both S/Gs - GREATER THAN 110 PSIG	b. Monitor RCS pressure. <u>IF</u> RCS pressure does <u>NOT</u> increase afte faulted S/G dryout. <u>THEN</u> go to Step 16.
c. Check RCS pressure - STABLE OR	c. Return to Step 1.

			REV: 30
E-1	LOSS OF REACTOR OR S	ECONDARY COOLANT	PAGE 15 of 23
16 Check If E Should Be a. Verify AC energized o Emerge - OPEN o AC eme GREATE o AC eme	C emergency busses by offsite power: ency D/G output breakers	 RESPONSE NOT OBTAINED a. Perform the followin 1) Close non-safegua breakers as neces Bus 13 to Bus 1 Bus 13 to Bus 1 Bus 15 to Bus 1 2) Place the followi PULL STOP: EH pumps Turning gear oi HP seal oil bac 3) Ensure condenser mode control in M 4) Restore power to A from Bus 13 B from Bus 15 E from Bus 15 F from Bus 15 Start HP seal oil 6) Ensure D/G load w 	rds bus tie sary: 4 tie 6 tie ng pumps in 1 pump kup pump steam dump ANUAL. MCCs: backup pump.

7) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting breaker. :

- 8) Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power.
- 9) Try to restore offsite power (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).
- b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)

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EOP: E-1	LOSS OF REACTOR OR SECONDARY COOLANT	REV: 30 PAGE 16 of 23
		_ <u>l</u>

Γ	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	17 Check If RHR Should Be Throttled:	-
	a. Check RWST level – LESS THAN 70%	a. Continue with Step 18. <u>WHEN</u> RWST level less than 70%. <u>THEN</u> perform step 17b.
	b. Perform ATT-14.7, ATTACHMENT ADJUST RHR FLOW to locally adjust HCV-624 and HCV-625.	b. Manually adjust RHR Hx outlet valves equally to reduce flow to less than 1500 gpm per operating pump
		• RHR Hx A, HCV-625 • RHR Hx B, HCV-624

EOP: T E-1	LOSS OF REACTOR OR S	SECONDARY COOLANT	REV: 30
			PAGE 17 of 2
- STEP ACT	ION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
a. Check 1) At fl po an AT	CNMT Sump lation Capability: RHR and CCW systems: least one recirculation owpath, including required wer supplies, from Sump B l back to RCS available per C-14.5, ATTACHMENT RHR STEM	a. <u>IF</u> at least one flo leg recirculation c <u>NOT</u> be verified, <u>TH</u> ECA-1.1, LOSS OF EM COOLANT RECIRCULATI	apability can <u>EN</u> go to ERGENCY
av. 3) At	least one CCW pump ailable. least one CCW Hx available. SW pumps - AT LEAST 2	b. Attempt to restore	at least 2 SM
PUMPS	AVAILABLE	pumps to operable. <u>IF</u> only 1 SW pump a <u>THEN</u> refer to ATT-2 ATTACHMENT MIN SW f guidance. <u>IF</u> no SW pumps are <u>THEN</u> perform the fo	.1, or additional available,
		 Pull stop any D/ supplied by alte cooling, <u>AND</u> imm depress associat SHUTDOWN pushbut Refer to ATT-2.4 	G that is <u>NOT</u> rnate ediately ed VOLTAGE ton.
		NO SW PUMPS. 3) Go to ECA-1.1. L EMERGENCY COOLAN RECIRCULATION.	
sub-b leaka	tch AO to check AUX BLDG asement for RHR system ge (AUX BLDG sub-basement ay be required)	c. <u>IF</u> any RHR pump sea indicated. <u>THEN</u> lea be evaluated and is necessary.	kage should

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	·
19 Evaluate Plant Status: a. Check auxiliary building 	a. Notify RP and refer to
radiation - NORMAL	appropriate AR-RMS procedure.
 Plant vent iodine (R-10B) Plant vent particulate (R-13) Plant vent gas (R-14) 	<u>IF</u> the cause is a loss of RCS inventory outside CNMT, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE
 CCW liquid monitor (R-17) LTDN line monitor (R-9) CHG pump room (R-4) 	CONTAINMENT, Step 1.
b. Direct RP to obtain following samples:	· · · ·
 RCS boron RCS activity CNMT hydrogen CNMT sump boron CNMT Sump pH 	
c. Verify adequate Rx head cooling:	
1) Verify at least one control rod shroud fan - RUNNING	1) Manually start one fan as power supply permits (45 kw)
2) Verify one Rx compartment cooling fan - RUNNING	2) Perform the following:
	o Dispatch AO to reset UV relays at MCC C and MCC D.
	o Manually start one fan as power supply permits (23 kw)

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EOP:	TINE:		REV: 30
E-1	LOSS OF REACTOR OR SH	ECONDARY COOLANT	PAGE 19 of
		<u> </u>	
STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	
20 Check : Depress	If RCS Cooldown And surization Is Required:	-	
a. RCS j 250 j	pressure – GREATER THAN psig [465 psig adverse CNMT]	a. <u>IF</u> RHR pump flow g 475 gpm, <u>THEN</u> go t	reater than to Step 21.
	D ES-1.2, POST LOCA COOLDOWN DEPRESSURIZATION, Step 1		

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EOP: TINE: E-1 LOSS OF REACTOR OR S	ECONDARY COOLANT PAGE 20 of	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
<u>NOTE</u> : IF D/Gs supplying emergency AC bus be shed as necessary to allow star		
21 Establish Adequate SW Flow:		
a. Verify at least two SW pumps - RUNNING	a. Start additional SW pumps as power supply permits (257 kw each). <u>IF</u> only 1 SW pump operable, <u>THEN</u> perform the following:	
	 Ensure ATT-2.1, ATTACHMENT MIN SW is in progress. 	
	2) Go to Step 22.	
	<u>IF</u> no SW pumps are available. <u>THEN</u> perform the following:	
	 Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. 	
	2) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.	
	3) Go to ECA-1.1. LOSS OF EMERGENCY COOLANT RECIRCULATION.	
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.	
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 		
c. Dispatch AO to check BOTH CCW Hx - IN SERVICE	c. Locally place BOTH CCW Hxs in service	
This Step continued on the next page.		

р: Е-1	LOSS OF	REACTOR OR	SECONDARY COOLANT	REV: 30
				PAGE 21 of
STEP	ACTION/EXPECTED R	ESPONSE	RESPONSE NOT OBTAINED]
(Step	21 continued fro	om previous pa	age) .	
	ermine required S HXs per table:	SW flow to		
	SW DISCHARGE ALIGNMENT	CCW HXS IN SERVICE	REQUIRED SW FLOW	
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HX	.s
	Normal	1	5000 - 6000 gpm to in-service HX	
	Alternate	2	30–33" d/p across each HX	
	Alternate	1	95–100" d/p across in-service HX	
req	ect AO to adjust uired value <u>IF</u> on normal SW d		e. <u>IF</u> the required SW f be obtained, <u>THEN</u> pe following:	
	• V-4619, CCW HX • V-4620, CCW HX	A	l) Isolate SW to scr air conditioning	
-OR- o <u>IF</u> on alternate SW discharge: • V-4619C, CCW HX A • V-4620B, CCW HX B		 MOV-4609/MOV-47 LEAST ONE CLOSE MOV-4663/MOV-47 LEAST ONE CLOSE 	D 33 - AT	
		2) Direct AO to loca SW flow to requir	lly adjust	
			3) Direct AO to loca SW return from SE	lly isolate
			 SFP Hx A (V-462 alternate SW di V-4622A) SFP Hx B (V-868 	scharge use
			4) Verify SW portion	s of ENT SD-1 are

E-1 LOSS OF REACTOR OR SE	CONDARY COOLANT
	PAGE 22
· · · · · · · · · · · · · · · · · · ·	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22 Establish CCW flow to RHR Hxs:	•
a. Check both CCW pumps - RUNNING	a. Perform the following:
	 Start CCW pumps as power supply permits (122 kw each)
	2) <u>IF</u> both CCW pumps are running, <u>THEN</u> go to step 221
	 <u>IF</u> only one CCW pump is running, <u>THEN</u> perform the following:
	a) Direct AO to isolate CCW to boric acid evaporator
	o Close V-760A
	b) Manually open CCW MOV to only one operable RHR Lo
	o Open MOV-738A
	-OR-
	o Open liGV-738B
	c) Go to step 23.
b. Manually open CCW valves to RHR Hxs	b. Dispatch AO to locally open valves.
 MOV-738A MOV-738B 	

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:	EOP: TITLE: E-1 LOSS OF REACTOR OR SECONDARY COOLANT			REV:	30	
•				PAGE	23 of	E 23
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-	STEP AC	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	<u> </u>		
		<u>.</u>				
	23 Check : Recircu	If Transfer To Cold Leg ulation Is Required:				
	a. RWST	level - LESS THAN 28%	a. Return to Step 17.			
		o ES-1.3, TRANSFER TO COLD RECIRCULATION, Step 1				
			END-			
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λ. <i>Έ</i>						
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EOP: E-1	LOSS OF REACTOR OR SECONDARY COOLANT
	PAGE 1 of 1
	E-1_APPENDIX_LIST
	TITLE
1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
4) ATTACHMENT D/G STOP (ATT-8.1)
. 5) ATTACHMENT SD-1 (ATT-17.0)
6) ATTACHMENT SI/UV (ATT-8.4)
7) ATTACHMENT MIN SW (ATT-2.1)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
11) ATTACHMENT RHR SYSTEM (ATT-14.5)
12) ATTACHMENT ADJUST RHR FLOW (ATT-14.7)

13) FOLDOUT

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EOP:		REV: 30
E-1	LOSS OF REACTOR OR SECONDARY COOLANT	PAGE 1 of 1
	RED PATH SUMMARY	
a. Si	UBCRITICALITY - Nuclear power greater than 5%	
b. C	ORE COOLING - Core exit T/Cs greater than 1200°F -OR- Core exit T/Cs greater than 700°F <u>ANI</u> RVLIS level (no RCPs) less than 52% adverse CNMT]	
c. HI	EAT SINK - Narrow range level in all S/Gs less than [25% adverse CNMT] <u>AND</u> total feedwater to less than 200 gpm	
d. I	NTEGRITY - Cold leg temperatures decrease greater t 100°F in last 60 minutes <u>AND</u> RCS cold le temperature less than 285°F	

e. CONTAINMENT - CNMT pressure greater than 60 psig

.

LOSS OF REACTOR OR SECONDARY COOLANT

FOLDOUT PAGE

1. RCP TRIP CRITERIA

TITLE:

IF BOTH conditions listed below occur, THEN trip both RCPs:

- a. SI pumps AT LEAST TWO RUNNING
- b. RCS pressure minus maximum S/G pressure LESS THAN 175 PSIG [400 psig adverse CNMT]
- 2. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

3. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:

- RCS subcooling based on core exit T/Cs LESS THAN OF USING FIGURE MIN SUBCOOLING
 OR -
- o PRZR level CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT

4. SI TERMINATION CRITERIA

IF ALL conditions listed below occur, THEN go to ES-1.1, SI TERMINATION, Step 1:

- a. RCS subcooling based on core exit T/Cs GREATER THAN 0° F USING FIGURE MIN SUBCOOLING
- b. Total feed flow to intact S/Gs GREATER THAN 200 GPM
 OR -

Narrow range level in at least one intact S/G - GREATER THAN 7% [25% adverse CNMT]

- c. RCS pressure:
 - o GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
 - o STABLE OR INCREASING
- d. PRZR level GREATER THAN 10% [30% adverse CNMT]

5. SECONDARY INTEGRITY CRITERIA

IF any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized<u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1.

6. E-3 TRANSITION CRITERIA

<u>IF</u> any S/G level increased in an uncontrolled manner or any S/G has abnormal radiation,<u>THEN</u> manually start SI pumps as necessary <u>AND</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

EOP:	TIRE:	REV: 30
E-1	LOSS OF REACTOR OR SECONDARY COOLANT	KEV: 50
		PAGE 2 of 2

7. COLD LEG RECIRCULATION SWITCHOVER CRITERION

IF RWST level decreases to less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

8. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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EOP:		REV: 12
E-2	FAULTED STEAM GENERATOR ISOLATION	PAGE 1 of a

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GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	TINE:	REV: 12
E-2	FAULTED STEAM GENERATOR ISOLATION	
1		PAGE 2 of 8

- A. PURPOSE This procedure provides actions to identify and isolate a faulted steam generator.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, with the following symptoms:
 - Any S/G pressure decreasing in an uncontrolled manner.
 - 2) Any S/G completely depressurized.
 - b. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, E-3, STEAM GENERATOR TUBE RUPTURE, ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED, and ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED, with the following symptoms and/or conditions:
 - Any S/G pressure decreasing in an uncontrolled manner.
 - 2) Any S/G complete depressurized.
 - 3) Faulted S/G isolation not verified.
 - c. FR-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL, when the affected S/G is identified as faulted.
 - d. Other procedures whenever a faulted S/G is identified.
 - e. ECA-2.1 Foldout Page if any S/G pressure increases.

EOP: E-2 FAULTED STEAM GENERA STEP ACTION/EXPECTED RESPONSE	ATOR ISOLATION	REV: 12 PAGE 3 of 8
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
· · · · · · · · · · · · · · · · · · ·		}
CAUTION		* * * * * * *
o AT LEAST ONE S/G SHALL BE MAINTAINED AV	AILABLE FOR RCS COOLDOWN	•
 ANY FAULTED S/G OR SECONDARY BREAK SHOU SUBSEQUENT RECOVERY ACTIONS UNLESS NEED 		G
	* * * * * * * * * * * *	* * * * * * *
<u>NOTE</u> : o Critical Safety Function Status T	rees should be monitored	•
 o Adverse CNMT values should be use greater than 4 psig or CNMT radia 	d whenever CNMT pressure tion is greater than 10 ⁺	is 05 R/hr.
o Foldout page should be open and m	nonitored periodically.	
1 Check MSIV Of Faulted S/G(s) - CLOSED	Manually close valve.	
	<u>IF</u> valve will <u>NOT</u> close <u>THEN</u> dispatch AO with 1 key to locally closed f S/G(s) MSIV as follows:	ocked valve aulted
	o S/G A	
	 close IA to MSIV, open vent valves V V-5473 	
	o S/G B	
	 close IA to MSIV, open vent valves V V-5474 	

E0P: E-2	TIRE: FAULTED STEAM GENEI	RATOR ISOLATION	REV: 12
			PAGE 4 of 8
2 Check Side I o Chec	CTION/EXPECTED RESPONSE If Any S/G Secondary s Intact: ek pressure in S/G A - STABLE INCREASING	RESPONSE NOT OBTAINED <u>IF</u> both S/G pressures d an uncontrolled manner. ECA-2.1. UNCONTROLLED DEPRESSURIZATION OF BOT GENERATORS.	ecreasing in <u>THEN</u> go to
o Chec	-OR- ek pressure in S/G B - STABLE INCREASING	Step 1.	
o Faul DECR MANN	Faulted S/G Status: Lted S/G pressure - REASING IN AN UNCONTROLLED NER -OR- -OR-	 <u>IF</u> both S/G pressures a increasing, <u>THEN</u> search initiating break and go Main steamlines Main feedlines S/G blowdown system Sample system 	for
	RESSURIZED	· .	

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EOP:	TITLE: .	REV:	12	
E-2	FAULTED STEAM GENERATOR ISOLATION		F . 6	~
	Avr.	PAGE	5 OI	8

Isolate Feed Flow To Faulted S/G:	Manually close valves.
o Close faulted S/G MDAFW pump discharge valve	<u>IF</u> valves can <u>NOT</u> be closed. <u>THEN</u> dispatch AO to locally isolate flowpaths as necessary.
 S/G A. MOV-4007 S/G B. MOV-4008 	
o Pull stop faulted S/G MDAFW pump	
o Close faulted S/G TDAFW flow control valve	
 S/G A. AOV-4297 S/G B. AOV-4298 	
o Verify faulted S/G MFW regulating valve and bypass valve - CLOSED	
 S/G A. HCV-466 and HCV-480 S/G B. HCV-476 and HCV-481 	
o Verify MDAFW pump crosstie valves – BOTH CLOSED	
 MOV-4000A MOV-4000B 	•
o Close faulted S/G SAFW pump discharge valve	
 S/G A, MOV-9701A S/G B, MOV-9701B 	

EOP:			REV: 12
E-2	FAULTED STEAM GE	INERATOR ISOLATION	PAGE 6 of
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
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тг тиг	TDAFW PUMP IS THE ONLY AVAILAB		I STEAM
	TO THE TDAFW PUMP MUST BE MAIN		U D I D D I D D D D D D D D D D
* * * *	* * * * * * * * * * * * * * *	* * * * * * * * * * * * *	* * * * * * *
F T - -	lata Chaon Blass Ener	Marca 17 1	
	late Steam Flow From lted S/G:	Manually close valves	
о	Verify faulted S/G ARV - CLOSED	IF valves can <u>NOT</u> be o dispatch AO to locally flowpaths as necessary	/ isolate
	• S/G A. AOV-3411 • S/G B. AOV-3410		
	Close faulted S/G TDAFW pump steam supply valve and place in PULL STOP		
	 S/G A. MOV-3505A S/G B. MOV-3504A 		
	Verify faulted S/G blowdown and sample valves - CLOSED		
	 S/G A. AOV-5738 and AOV-5735 S/G B. AOV-5737 and AOV-5736 		
	Dispatch AO to complete faulted S/G isolation (Refer to ATT-10.0. ATTACHMENT FAULTED S/		

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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED GAUTION IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1. ALTERNATE WATER SUPPLY TO AFW PUMPS). NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Maintain total feed flow greate than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G. b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. 7 Check Secondary Radiation Levels - NORMAL IF steemline radiation monitor (R-31 and R-32) 0 Air ejector radiation monitor (R-15) IF abnormal radiation levels detected in any S/G. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. 0 S/G blowdown radiation monitor (R-19) Neguest RP sample S/Gs for activity	P: TITLE: E-2 FAULTED STEAM GEN	
CAUTION IF CST LEVEL DECREASES TO LESS THAN 5 FEET. THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS). NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 6 Monitor Intact S/G Levels: a. Maintain total feed flow greate than 200 gpm until narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Maintain total feed flow greate than 200 gpm until narrow range level scel greater than 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/G. 7 Check Secondary Radiation Levels - NORMAL b. If steamline radiation monitor (R-31 and R-32) o. Air ejector radiation monitor (R-15) If shormal radiation levels detected in any S/G. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. o. S/G blowdown radiation monitor (R-19) o. Requeet RP sample S/Gs for		PAGE 7 c
 IF CST LEVEL DECREASES TO LESS THAN 5 FEET. THEN ALTERNATE WATER SUPPLY TO AFW PUMPS). NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% c. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for 	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<pre>IF CST LEVEL DECREASES TO LESS THAN 5 FEET. THEN ALTERNATE WATER SUPPLY TO AFW PUMPS). NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Maintain total feed flow greate than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. If narrow range level in any S/ continues to increase in an uncontrolled manner. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. b. S/G blowdown radiation monitor (R-19) b. Request RP sample S/Gc for </pre>	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
 AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1. ALTERNATE WATER SUPPLY TO AFW PUMPS). NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] in at least one S/G. b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/G. b. IF narrow range level in any S/G. b. IF narrow range level in any S/G. b. IF steamline radiation monitor (R-31 and R-32) o S/G blowdown radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gc for 	CAUT	ION
 * 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. 7 Check Secondary Radiation Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for 	AFW PUMPS WILL BE NECESSARY (REFER TO 2	
 * 6 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. 7 Check Secondary Radiation Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for 	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
 a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G. b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3. STEAM GENERATOR TUBE RUPTURE, Step 1. 7 Check Secondary Radiation Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for 	<u>NOTE</u> : TDAFW pump flow control AOVs may	drift open on loss of IA.
 THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% b. IF narrow range level in any S/ continues to increase in an uncontrolled manner. <u>THEN</u> go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 1. 7 Check Secondary Radiation Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for 	• 6 Monitor Intact S/G Levels:	
 narrow range level between 17% [25% adverse CNMT] and 50% 7 Check Secondary Radiation Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for continues to increase in an uncontrolled manner. <u>THEN</u> go to E-3. STEAM GENERATOR TUBE RUPTURE, Step 1. 		than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one
Levels - NORMAL o Steamline radiation monitor (R-31 and R-32) o Air ejector radiation monitor (R-15) o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for	narrow range level between 17%	continues to increase in an uncontrolled manner. <u>THEN</u> go to E-3, STEAM GENERATOR TUBE
<pre>(R-31 and R-32) IF abnormal radiation levels detected in any S/G. THEN go to E-3. STEAM GENERATOR TUBE RUPTURE. (R-15) Step 1. o S/G blowdown radiation monitor (R-19) o Request RP sample S/Gs for</pre>		available, <u>THEN</u> dispatch AO to
 Air ejector radiation monitor E-3. STEAM GENERATOR TUBE RUPTURE. (R-15) Step 1. S/G blowdown radiation monitor (R-19) Request RP sample S/Gs for 		
(R-19) o Request RP sample S/Gs for		E-3. STEAM GENERATOR TUBE RUPTURE

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OP: TITLE:		
E-2 FAULTED STEAM GENER	ATOR ISOLATION	REV: 12
		PAGE 8 of 8
		=
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
 8 Adjust Steam Dump To Minimize RCS Heatup: a. Determine allowable intact S/G pressure using maximum hot leg 	-	
temperature (Refer to FIG-7.0, FIGURE INTACT S/G PRESSURE)		
 b. Check condenser steam dump available: o Verify intact S/G MSIV - OPEN o Annunciator G-15. STEAM DUMP ARMED- LIT c. Verify steam dump mode selector switch in MANUAL d. Adjust condenser steam dump controller in AUTO to pressure determined from FIG-7.0. FIGURE INTACT S/G PRESSURE 	 b. Perform the followi 1) Adjust intact S/ pressure determi FIG-7.0, FIGURE PRESSURE. 2) Go to E-1, LOSS SECONDARY COOLAN 	G ARV to ned from INTACT S/G OF REACTOR OR
9 Go To E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1		
- EN	D -	

EOP:	TITLE:		REV: 12
E-2		FAULTED STEAM GENERATOR ISOLATION	PAGE 1 of 3

E-2 APPENDIX LIST

TITLE

1) FIGURE INTACT S/G PRESSURE (FIG-7.0)

2) ATTACHMENT FAULTED S/G (ATT-10.0)

3) ATTACHMENT NO SW PUMPS (ATT-2.4)

4) FOLDOUT

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EOP:	TIRE:					REV:	12		
E-2		FAULTED	STEAM	GENERATOR	ISOLATION	PAGE	1	of	1

FOLDOUT PAGE

1. LOSS OF SW CRITERIA -

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

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E-3		STEAM	GENERATOR	TUBE	RUPTURE	• '	NEV: 50
							PAGE 1 of 42

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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EOP:	TIRE:	REV: 38
E-3	STEAM GENERATOR TUBE RUPTURE	
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A. PURPOSE - This procedure provides actions to terminate leakage of reactor coolant into the secondary system following a steam generator tube rupture (SGTR), this procedure should also be used for a SGTR in one S/G and a fault in the other S/G.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, when condenser air ejector radiation or blowdown radiation is abnormal, or
 - b. E-0, REACTOR TRIP OR SAFETY INJECTION,
 E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
 E-2, FAULTED STEAM GENERATOR ISOLATION, and
 FR-H.3, RESPONSE TO STEAM GENERATOR HIGH LEVEL,
 when secondary radiation is abnormal, or
 - c. E-0, REACTOR TRIP OR SAFETY INJECTION, E-1, LOSS OF REACTOR OR SECONDARY COOLANT, E-2, FAULTED STEAM GENERATOR ISOLATION, ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, when an intact S/G narrow range level increases in an uncontrolled manner.
 - d. ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, when pressurizer pressure control is restored.
 - e. Any FOLDOUT page that has E-3 transition criteria whenever either S/G level increases in an uncontrolled manner or either S/G has abnormal radiation.

EOP:	
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TIRE:

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STEAM GENERATOR TUBE RUPTURE

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
<u>NOTE</u> : o_ FOLDOUT page should be open AND	monitored periodically.				
o Critical Safety Function Status Trees should be monitored (Refer to Appendix 1 for Red Path Summary).					
o Personnel should be available f	for sampling during this procedure.				
o Conditions should be evaluated for Site Contingency Reporting (EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).					
o Adverse CNMT values should be u greater than 4 psig or CNMT rad	used whenever CNMT pressure is liation is greater than 10 ⁺⁰⁵ R/hr.				
* 1 Monitor RCP Trip Criteria:					
a. RCP status - ANY RCP RUNNING	a. Go to Step 2.				
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 2.				
c. RCS pressure minus maximum S/G pressure – LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 2.				
d. Stop both RCPs					
-					

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	PAGE 4 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTI</u>	• • • • • • • • • • • • • • • • • • •
IF OFFSITE POWER IS LOST AFTER SI RESET TO RESTART SAFEGUARDS EQUIPMENT. (REFE OFFSITE POWER)	
2 Identify Ruptured S/G(s):	Perform the following:
o Unexpected increase in either S/G narrow range level	a. Reset SI
-OR-	b. Continue with Steps 10 through 16. <u>WHEN</u> ruptured S/G(s) identified. <u>THEN</u> do Steps
o High radiation indication on main steamline radiation monitor	3 through 9.
 R-31 for S/G A R-32 for S/G B 	
-OR-	
o AO reports local indication of high steamline radiation	
-OR-	
 RP reports high radiation from S/G activity sample 	

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 O IF THE TDAFW PUMP IS THE ONLY AVAILANT TO THE TDAFW PUMP MUST BE MAINTAINED O AT LEAST ONE S/G SHALL BE MAINTAINED 	BLE SOURCE OF FEED FLOW, STEAM SUPPLY FROM ONE S/G.
TO THE TDAFW PUMP MUST BE MAINTAINED	FROM ONE S/G.
• AT LEAST ONE S/G SHALL BE MAINTAINED	AVAILABLE FOR RCS COOLDOWN.
<pre>3 Isolate Flow From Ruptured S/G(s):</pre>	
a. Adjust ruptured S/G ARV controller to 1050 psig in AUTO	•
b. Check ruptured S/G ARV - CLOSED	b. <u>WHEN</u> ruptured S/G pressure less than 1050 psig, <u>THEN</u> verify S/G ARV closed. <u>IF NOT</u> closed. <u>THEN</u> place controller in MANUAL and close S/G ARV.
	<u>IF</u> S/G ARV can <u>NOT</u> be closed. <u>THEN</u> dispatch AO to locally isolate.
c. Close ruptured S/G TDAFW pump steam supply valve and place in PULL STOP	c. Dispatch AO with locked valve key to locally isolate steam from ruptured S/G to TDAFW pump.
 S/G A. MOV-3505A S/G B. MOV-3504A 	• S/G A. V-3505 • S/G B. V-3504
d. Verify ruptured S/G blowdown valve - CLOSED	d. Place S/G blowdown and sample valve isolation switch to CLOSE.
 S/G A, AOV-5738 S/G B, AOV-5737 	<u>IF</u> blowdown can <u>NOT</u> be isolated manually, <u>THEN</u> dispatch AO to locally isolate blowdown.
	• S/G A, V-5701 • S/G B, V-5702

E-3 STEAM GENERATOR	TUBE RUPTURE REV: 38
	PAGE 6 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Complete Ruptured S/G Isolation:	
a. Close ruptured S/G MSIV - RUPTURED S/G MSIV CLOSED	a. Perform the following:
	1) Close intact S/G MSIV.
· ·	 Place intact S/G ARV controller at 1005 psig in AUTO.
· ·	 Adjust condenser steam dump controller to 1050 psig in AUTO.
	4) Place condenser steam dump mode selector switch to MANUAL.
	5) Adjust reheat steam supply controller cam to close reheat steam supply valves.
	6) Ensure turbine stop valves - CLOSED.
	7) Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, parts A and B).
	8) Go to step 5.
b. Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G part A)	
	<i>.</i>

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	د- <u>ت</u>	SIEAN GENERATOR TOBE ROFTORE	PAGE	7 of 4	42

STEP ACTION/EXPECTED RESPONSE **RESPONSE NOT OBTAINED** CAUTION IF ANY RUPTURED S/G IS FAULTED. FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN. 5 Check Ruptured S/G Level: a. Narrow range level - GREATER a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, THAN 7% [25% adverse CNMT] THEN perform the following: 1) Maintain feed flow to ruptured S/G until level greater than 7% [25% adverse CNMT]. 2) Continue with Step 6. WHEN ruptured S/G level greater than 7% [25% adverse CNMT]. THEN do Steps 5b through e. b. Close MDAFW pump discharge valve b. Dispatch AO to locally close to ruptured S/G valve. • S/G A. MOV-4007 • S/G B, MOV-4008 c. Pull stop MDAFW pump for ruptured S/G d. Close TDAFW pump flow control d. Dispatch AO with locked valve valve to ruptured S/G key to locally close TDAFW pump manual feedwater isolation valve • S/G A, AOV-4297 to ruptured S/G. • S/G B. AOV-4298 • S/G A, V-4005 • S/G B. V-4006 e. Verify MDAFW pump crosstie e. Manually close valves. valves - CLOSED MOV-4000A • MOV-4000B

 STEP ACTION/EXPECTED RESPONSE 6 Verify Ruptured S/G Isolated: a. Check ruptured MSIV - CLOSED b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED c. Ruptured S/G - ISOLATED c. Ruptured S/G pressure - GREATER THAN 300 PSIG 7 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: b. Intact S/G MSIV - OPEN c. Annunciator G-15, STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller BC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector switch to MANUAL 	E-3 STEAM GENERAT	OR TUBE RUPTURE PAGE 8 of 42
 6 Verify Ruptured S/G Isolated: a. Check ruptured MSIV - CLOSED b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Ruptured S/G pressure - GREATER THAN 300 PSIG 7 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: o Intact S/G MSIV - OPEN Annunciator G-15, STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 		FAGE 0 01 42
 a. Check ruptured MSIV - CLOSED a. Direct AO to immediately isolate air ejector/gland steam supply and flange heating steam. (Refer to ATT-16.0, ATTACHNENT RUPTURED S/G, part A). b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED b. Continue efforts to isolate steam supply from ruptured S/G: c. Ruptured S/G pressure - GREATER THAN 300 FSIG d. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8. a. Adjust S/G ARV controllers to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 a. Check ruptured MSIV - CLOSED a. Direct AO to immediately isolate air ejector/gland steam supply and flange heating steam. (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, part A). b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED b. Continue efforts to isolate steam supply from ruptured S/G: a. S/G A, MOV-3505A OR V-3504 c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Second Solution Control and the standard of the steam supply from ruptured S/G is standard of the steam supply from ruptured S/G is standard of the steam supply from ruptured S/G: a. Verify condenser Steam Dump Pressure Control: a. Verify condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 		
 air ejector/gland steam supply and flange heating steam. (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, part A). b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED b. Continue efforts to isolate steam supply from ruptured S/G: • S/G A. MOV-3505A <u>OR</u> V-3505 • S/G B. MOV-3504A <u>OR</u> V-3504 c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Stablish Condenser Steam Dump Pressure Control: a. Verify condenser available: • Intact S/G MSIV - OPEN • Adjust S/G ARV controllers to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 	6 Verify Ruptured S/G Isolated:	-
 from ruptured S/G - ISOLATED from ruptured S/G - ISOLATED steam supply from ruptured S/G: S/G A. MOV-3505A OR V-3505 S/G B. MOV-3504A OR V-3504 c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1. 7 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: o Intact S/G MSIV - OPEN o Annunciator G-15. STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 	a. Check ruptured MSIV – CLOSED	air ejector/gland steam supply and flange heating steam. (Refer to ATT-16.0, ATTACHMENT
 c. Ruptured S/G pressure - GREATER THAN 300 PSIG c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1. 7 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: b. Adjust S/G MSIV - OPEN c. Annunciator G-15. STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1. 		steam supply from ruptured S/G: • S/G A. MOV-3505A <u>OR</u> V-3505
 Dump Pressure Control: a. Verify condenser available: a. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8. a. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8. b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector 		c. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED
 Intact S/G MSIV - OPEN Annunciator G-15. STEAM DUMP ARMED - LIT Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO Place steam dump mode selector 		
ARMED - LIT b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector	•	maintain intact S/G pressure in
controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector		-
	controller HC-484 to maintain intact S/G pressure and verify	

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STEP —	ACTION/EXPECT	ED RESPONSE		RESPONSE	NOT OBTAINED	
* * * *	* * * * * * * *	-*****	CAUTION	* * * * *	* * * * * * *	* * * * * * *
	ITE POWER IS LO ART SAFEGUARDS POWER)					
* * * *	* * * * * * * *	* * * * * *	* * * *	* * * * *	* * * * * * *	* * * * * * *
8 Rese	et SI					

TITLE:			
E-3	STEAM GENE	RATOR TUBE RUPTURE	REV: 38
			PAGE 10 of 42
STEP ACTION/E	XPECTED RESPONSE	RESPONSE NOT OBTA	INED
* * * * * * * * *	* * *_* * * * * *	* * * * * * * * * * * * * *	* * * * * * * * * *
	N CHATT DE MATNIMA	<u>CAUTION</u> AINED GREATER THAN 7% [25% AI	
DURING THE RCS CC	OLDOWN, UNLESS TH	HE RUPTURED S/G IS ALSO FAULT	red.
* * * * * * * * *	* * * * * * * * *	* * * * * * * * * * * * * * *	*******
<u>NOTE</u> : Following i trip criter	initiation of cont ia is no longer a	rolled cooldown or depressum applicable.	cization, RCP
9 Initiate RCS	Cooldown:		
	required core exit	:	
	e from below table		
	RUPTURED SG PRESSURE	REQUIRED CORE EXIT TEMPERATURE (°F)	
	1100 PSIG	525 [517 adverse CNMT]	
	1000 PSIG 900 PSIG	512 [504 adverse CNMT] 499 [490 adverse CNMT]	
	800 PSIG 700 PSIG	484 [475 adverse CNMT] 468 [457 adverse CNMT]	
	600 PSIG 500 PSIG	449 [437 adverse CNMT] 428 [413 adverse CNMT]	
	400 PSIG 300 PSIG	402 [384 adverse CNMT] 369 [344 adverse CNMT]	
<u>THEN</u> initi condenser f	l S/G MSIV closed, Late dumping steam From intact S/G at	n to steam dump from	intact S/G at
maximum rat	.e	<u>IF</u> no intact S/(perform the foll	G available, <u>THEN</u> lowing:
		o Use faulted S	S/G.
		-OR-	
		used, <u>THEN</u> go SGTR WITH LOS	d S/G must be o to ECA-3.1. SS OF REACTOR BCOOLED RECOVERY p 1.
c. Core exit I REQUIRED TE	C/C8 - LESS THAN EMPERATURE	c. Continue with St core exit T/Cs required, <u>THEN</u> d	less than
d. Stop RCS cc core exit I required te	ooldown and stabil C/Cs less than emperature	ize	

E-3 STEAM GENERA	TOR TUBE RUPTURE	REV: 38
		PAGE 11 of 42
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
10 Monitor Intact S/G Level:		
a. Narrow range level - GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed than 200 gpm until n level greater than 7 adverse CNMT] in at S/G.	arrow range % [25%
b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. <u>IF</u> narrow range leve intact S/G continues in an uncontrolled m go to ECA-3.1. SGTR REACTOR COOLANT - SU RECOVERY DESIRED, St	to increase anner, <u>THEN</u> WITH LOSS OF BCOOLED
	-	

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E-3 STEAM GENERATOR TU STEP ACTION/EXPECTED RESPONSE CAUTION IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR AFTER PRESSURE DECREASES TO LESS THAN 2335 F 11 Monitor PRZR PORVS And Block Valves:	PAGE 12 of RESPONSE NOT OBTAINED PRESSURE, IT SHOULD BE CLOSED
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR AFTER PRESSURE DECREASES TO LESS THAN 2335 F	PRESSURE, IT SHOULD BE CLOSED
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR AFTER PRESSURE DECREASES TO LESS THAN 2335 F	PRESSURE, IT SHOULD BE CLOSED
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR AFTER PRESSURE DECREASES TO LESS THAN 2335 F	
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR AFTER PRESSURE DECREASES TO LESS THAN 2335 F	
AFTER PRESSURE DECREASES TO LESS THAN 2335 F	
	• • • • • • • • • • • • • • • • • • •
a. Power to PORV block valves - a AVAILABLE .	. Restore power to block valves unless block valve was closed to isolate an open PORV:
	 MOV-515, MCC D position 6C MOV-516, MCC C position 6C
b. PORVE - CLOSED E	 <u>IF</u> PRZR pressure less than 2335 psig. <u>THEN</u> manually close PORVs.
	<u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed. <u>THEN</u> go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.
c. Block valves – AT LEAST ONE OPEN c	. Open one block valve unless it was closed to isolate an open PORV.

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STEAM GENERATOR TUBE RUPTURE

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
ليستعم	L	
12 Res	set CI:	-
	Depress CI reset pushbutton	
ь.	Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following:
		1) Reset SI.
		2) Depress CI reset pushbutton.
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STEP ACT	ION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
BUSSES E POWER o Normal volt b o 480 vo THAN 4	All AC Busses - NERGIZED BY OFFSITE feed breakers to all 480 usses - CLOSED 1t bus voltage - GREATER 20 VOLTS ncy D/G output breakers -	 Perform the following: a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following as necessary: Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie
	· .	 PULL STOP: EH pumps Turning gear oil pump HP seal oil backup pump 3) Restore power to MCCs. A from Bus 13 B from Bus 13 B from Bus 15 E from Bus 15 F from Bus 15 4) Start HP seal oil backup pump 5) Start CNMT RECIRC fans as necessary.
		 6) Ensure D/G load within limits 7) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
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14 Verify Adequate SW Flow:	
a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each).
	<u>IF</u> less than two SW pumps running, <u>THEN</u> :
	1) Ensure SW isolation.
	2) <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	3) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0. ATTACHMENT SD-1)	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Establish IA to CNMT:	-
 a. Verify non-safeguards busses energized o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	 a. Perform the following: Close non-safeguards bus tiebreakers: Bus 13 to Bus 14 tie Bus 15 to Bus 14 tie Bus 15 to Bus 16 tie Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN perform the following: Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC)
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	 FANS) b. Perform the following: Restore IA using service air compressor <u>OR</u> diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) Go to step 15d.
 c. Verify turbine building SW isolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 	c. Manually align valves.
This Step continued on the next page.	

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STEP ACTION/EXPECTED RE	SPONSE	RESPONSE NOT OBTAINED	}
· · ·		••••••••••••••••••••••••••••••••••••••	J
(Step 15 continued-from	m previous page)		
d. Verify adequate air o - RUNNING	compressors	d. Manually start air c as power supply perm each). <u>IF</u> air compr <u>NOT</u> be started. <u>THEN</u> to locally reset com necessary.	its (75 kw essors can dispatch AO
e. Check IA supply:		e. Perform the followin	g:
o Pressure - GREATER 60 PSIG	R THAN	 Continue attempts IA (Refer to AP-I INSTRUMENT AIR). 	
o Pressure – STABLE INCREASING	OR	2) Continue with Ste IA restored, <u>THEN</u> 15f and g.	
f. Reset both trains of for IA to CNMT AOV-53			
g. Verify IA to CNMT AOV	V-5392 - OPEN		
* * * * * * * * * * * * * * *	<u>CAUTION</u>	* * * * * * * * * * * *	* * * * * * *
RCS PRESSURE SHOULD BE MONI UNCONTROLLED MANNER TO LESS RHR PUMPS MUST BE MANUALLY	S THAN 250 PSIG	[465 PSIG ADVERSE CNMT].	
* * * * * * * * * * * * * *	* * * * * * * *	* * * * * * * * * * *	
16 Check If RHR Pumps S Stopped:	should Be		
a. Check RCS pressure - THAN 250 psig [465 ps CNMT]		a. Go to Step 17.	
b. Stop RHR pumps and pl AUTO	lace both in		. ·

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17 Establish Charging Flow:	-
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally close seal injection needle valves to affected RCP.
	 V-300A for RCP A V-300B for RCP B
	2) Ensure HCV-142 demand at 0%.
 b. Align charging pump suction to RWST: o LCV-112B - OPEN 	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
o LCV-112C - CLOSED	<u>IF</u> LCV-112C can <u>NOT</u> be closed, <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
· · · · · · · · · · · · · · · · · · ·	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
c. Start charging pumps as necessary and establish 75 gpm total charging flow	
 Charging line flow Seal injection 	

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ſ	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	18 Check If RCS Cooldown Should Be Stopped:	
	a. Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE	a. Do <u>NOT</u> proceed until core exit T/Cs less than required temperature.
	b. Stop RCS cooldown	
	c. Stabilize core exit T/Cs – LESS THAN REQUIRED TEMPERATURE	
	19 Check Ruptured S/G Pressure - STABLE OR INCREASING	<u>IF</u> pressure continues to decrease to less than 250 psi above the pressure of the intact S/G. <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	20 Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING	Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1 .
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 STEP	ACTION/EXPECTED RESPONSE	L	RESPONSE NOT OBTAINED	
L]	L]		
NOTE:	SI ACCUMs may inject during	RCS depre	ssurization.	
21 Dej Bro	pressurize RCS To Minimi eak Flow And Refill PRZR	.ze :		
а.	Check the following:		a. Go to Step 22.	
	o Ruptured S/G level – LESS THAN 90% [80% adverse CN			
	o Any RCP - RUNNING			
	o IA to CNMT - AVAILABLE			
Ъ.	Spray PRZR with maximum available spray until ANY of following conditions satisf:	f the · Led:		
	o PRZR level - GREATER THAN [65% adverse CNMT]	1 75%		
	- OR -			
	o RCS pressure - LESS THAN SATURATION USING FIG-1.0 FIGURE MIN SUBCOOLING			
	- OR -			
	o <u>BOTH</u> of the following:			
	1) RCS pressure – LESS TH RUPTURED S/G PRESSURE	HAN		
	2) PRZR level – GREATER 10% [30% adverse CNMT			
c.	Close normal PRZR spray valu	ves:	c. Stop associated RCP(s	3).
	1) Adjust normal spray valve controller to 0% DEMAND	2		
	2) Verify PRZR spray valves CLOSED	-		
	• PCV-431A • PCV-431B			
d.	Verify auxiliary spray valve (AOV-296) - CLOSED	2	d. Decrease charging sp minimum and ensure cl valve to loop B cold (AOV-294).	narging
e.	Go to Step 24			

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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	RESULT IN ABNORMAL COMT CONDITION	
• CYC	LING OF THE PRZR PORV SHOULD BE MI	NIMIZED.
1	E UPPER HEAD REGION MAY VOID DURING INING. THIS MAY RESULT IN A RAPIDL	RCS DEPRESSURIZATION IF RCPS ARE NOT Y INCREASING PRZR LEVEL.
* * * *	* * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> :	o If auxiliary spray is in use, s closing normal charging valve A	pray flow may be increased by OV-294 and normal PRZR spray valves.
	o When using a PRZR PORV select o	ne with an operable block valve.
POR	pressurize RCS Using PRZR RV To Minimize Break Flow 1 Refill PRZR:	
а.	Verify IA to CNMT - AVAILABLE	a. Refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORVs.
	PRZR PORVS - AT LEAST ONE AVAILABLE	b. <u>IF</u> auxiliary spray available, <u>THEN</u> return to Step 21b.
		<u>IF</u> auxiliary spray can <u>NOT</u> be established, <u>THEN</u> go to ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 1.
j		
Thi	s Step continued on the next page.	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<pre>(Step 22 continued-from previous page c. Open one PRZR PORV until ANY of the following conditions satisfied:</pre>	
d. Close PRZR PORVs	d. <u>IF</u> either PRZR PORV can <u>NOT</u> be closed, <u>THEN</u> close associated block valve.

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STEP ACTION/EXPECTED RESPONSE _	RESPONSE NOT OBTAINED
23 Check RCS Pressure - INCREASING	- Close block valve for the PRZR PO that was opened.
	<u>IF</u> pressure continues to decrease, <u>THEN</u> perform the following:
	a. Monitor the following condition for indication of leakage from PRZR PORV:
	o PORV outlet temp (TI-438) <u>NC</u> decreasing.
	o PRT pressure, level or temperature continue to increase.
	b. Go to ECA-3.1, SGTR WITH LOSS O REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
• • • • • • • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * * *
SI MUST BE TERMINATED WHEN TERMINATION C OVERFILLING OF THE RUPTURED S/G.	RITERIA ARE SATISFIED TO PREVENT
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
24 Check If SI Flow Should Be Terminated:	
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
 b. Secondary heat sink: o Total feed flow to S/G(s) - GREATER THAN 200 GPM AVAILABLE -OR- 	b. <u>IF</u> neither condition satisfied. <u>THEN</u> do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
o Narrow range level in at least one intact S/G - GREATER THAN 7% [25% adverse CNMT]	
c. RCS pressure - STABLE OR INCREASING	c. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
d. PRZR level – GREATER THAN 10% [30% adverse CNMT]	d. Do <u>NOT</u> stop SI pumps. Return to Step 6.

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STEAM GENERATOR TUBE RUPTURE

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25 Stop SI Pumps And Place In AUTO	-
26 Establish Required Charging Line Flow:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch A0 to locally isolate seal injection to affected RCP:
	 RCP A, V-300A RCP B, V-300B
	2) Ensure HCV-142 open.
	3) Start one charging pump.
b. Establish 20 gpm charging line flow	
27 Monitor SI Reinitiation Criteria:	•
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED, Step 1.
b. PRZR level – GREATER THAN 10% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level.
	<u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

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28 Check If SI ACCUMs Should Be Isolated:	
 a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 10% [30% adverse CNMT] 	 Manually operate SI pumps as necessary and go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
 b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
• MOV-841 • MOV-865	 Open vent valves for unisolated SI ACCUMs. ACCUM A, AOV-834A ACCUM B, AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.
d. Locally reopen breakers for MOV-841 and MOV-865	

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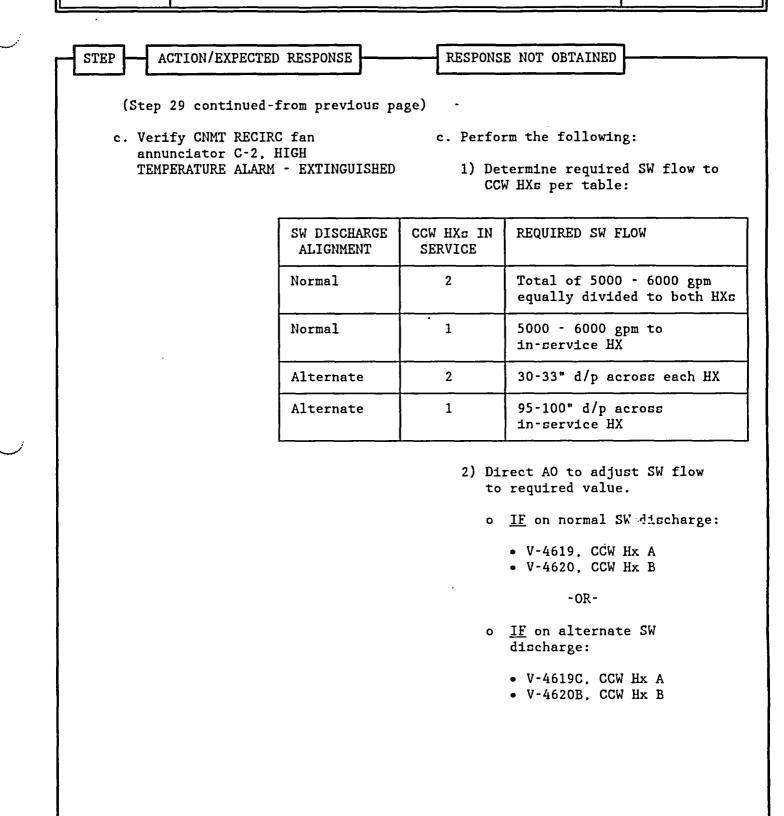
29 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least three SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
· · ·	 a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
.•	3) Go to Step 36.
b. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	

This Step continued on the next page.

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STEAM GENERATOR TUBE RUPTURE

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30 Check If Normal CVCS Operation Can Be Established	-
a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN	a. Continue with Step 36. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 30 through 35.
o IA pressure - GREATER THAN 60 PSIG	
b. Verify instrument bus D – ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:
	1) Verify MCC A energized.
	 Place instrument bus D on maintenance supply.
c. CCW pumps - ANY RUNNING	c. Perform the following:
	 <u>IF</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A. MOV-749A and MOV-759A RCP B. MOV-749B and MOV-759B
	2) Manually start one CCW pump.
d. Charging pump - ANY RUNNING	d. Continue with Step 36. <u>WHEN</u> any charging pump running. <u>THEN</u> do Steps 31 through 35.
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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
J		
	ck If Seal Return Flow uld Be Established:	•
	Verify RCP #1 seal outlet temperature – LESS THAN 235°F	a. Go to Step 32.
	Verify RCP seal outlet valves – OPEN	b. Manually open valves as necessary.
	• AOV-270A • AOV-270B	
	Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	Open RCP seal return isolation	d. Perform the following:
	valve MOV-313	1) Place MOV-313 switch to OPEN.
		 Dispatch AO to locally open MOV-313.
	Verify RCP #1 seal leakoff flow	e. Perform the following:
	- LESS THAN 6.0 GPM	1) Trip the affected RCP
		2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve
		 RCP A. AOV-270A RCP B. AOV-270B
		<u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 32.
	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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STEAM GENERATOR TUBE RUPTURE

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: Letdown orifice valves (A0V-200A, A0V-200B, and A0V-202) Letdown isolation valve A0V-371 Loop B cold leg to REGEN Hx A0V-427 c. Place letdown controllers in MANUAL at 40% open TCV-130 FCV-135 d. Reset both trains of XY relays for A0V-371 and A0V-427 d. Reset both trains of XY relays for A0V-371 and A0V-427 d. Reset both trains of XY relays for A0V-371 and A0V-427 f. Open letdown orifice valves as necessary g. Place FCV-135 in AUTO at 250 psig h. Place TCV-130 in AUTO at the normal setpoint Adjust charging pump speed and 		
 b. Place the following switches to CLOSE: b. Etdown orifice valves (AOV-200A, AOV-200B, and AOV-202) c. Letdown isolation valve AOV-371 c. Loop B cold leg to REGEN Hx AOV-427 c. Place letdown controllers in MANUAL at 40% open c. TCV-130 PCV-135 c. Reset both trains of XY relays for AOV-371 and AOV-427 d. Reset both trains of XY relays for AOV-371 and AOV-427 d. Reset both trains of XY relays for AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place PCV-135 in AUTO at 250 psig h. Place TCV-130 in AUTO at the normal setpoint i. Adjust charging pump speed and 	a. Establish charging line flow to	established, <u>THEN</u> establish excess
normal setpoint i. Adjust charging pump speed and	 CLOSE: Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) Letdown isolation valve AOV-371 Loop B cold leg to REGEN Hx AOV-427 c. Place letdown controllers in MANUAL at 40% open TCV-130 PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place PCV-135 in AUTO at 250 psig 	 valve, AOV-312, to NORMAL. o Ensure CCW from excess letdown open, (AOV-745). o Open excess letdown isolation valve AOV-310. o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. o Adjust charging pump speed as necessary. <u>IF</u> RCP seal return <u>NOT</u> established. <u>THEN</u> consult TSC to determine if excess letdown should be placed in
	normal setpoint i. Adjust charging pump speed and	

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	SIEF ACTION/EXTECTED RESPONSE	RESPONSE NOT OBTAINED
	34 Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
2	b. Adjust RMW flow control valve in AUTO to 40 gpm	
	c. Verify the following:	c. Adjust controls as necessary.
	1) RMW mode selector switch in AUTO	
	2) RMW control armed – RED LIGHT LIT	
	d. Check VCT level:	d. Manually increase VCT makeup flow as follows:
	o Level - GREATER THAN 20%	1) Ensure BA transfer pumps and
\bigcirc	-OR-	RMW pumps running. <u>IF NOT</u> . <u>THEN</u> reset MCC C and MCC D UV
	o Level - STABLE OR INCREASING	lockouts as necessary.
		 2) Place RMW flow control value HCV-111 in MANUAL and increase RMW flow.
		3) Increase boric acid flow as necessary.
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	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTA	AINED
	Charging Pump Suction	

 <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:

- 1) Ensure charging pump suction aligned to RWST
 - o LCV-112B open
 - o LCV-112C closed
- 2) Continue with Step 36. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 35b.

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- b. Manually align valves as necessary.
- b. Verify charging pumps aligned to VCT

a. VCT level - GREATER THAN 20%

- o LCV-112C OPEN
- o LCV-112B CLOSED

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STEAM GENERATOR TUBE RU

.

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EP -	ACTION/EXPECTED	RESPONSE	RESPONSE NOT	OBTAINED	
* * *	* * * * * * * * * * * * * * * * * * *	<u>CAUTION</u> SSURES MUST BE MAINT	CAINED LESS TH	AN 1050 PSIG.	
Cha RCS a. 1	trol RCS Pressu rging Flow To D -To-Secondary L Perform appropriato from table:	Minimize eakage:			
	PRZR LEVEL	RUPTURED S/G NARROW RANGE LEVEL			
	TRAFT	INCREASING	DECREASING	OFFSCALE HIGH	
	ESS THAN 20% 40% ADVERSE CNMT]	o Increase charging flow o Depressurize RCS using Step 36b	Increase charging flow	 Increase charging flow Maintain RCS and ruptured S/G pressure equal 	
[[[ETWEEN 20% 40% ADVERSE CNMT] ND 50%	Depressurize RCS using Step 36b	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal	
	ETWEEN 50% AND 75% 65% ADVERSE CNMT]	o Depressurize RCS using Step 36b o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal	
	REATER THAN 75%	o Decrease charging flow	Energize PRZR	Maintain RCS and ruptured S/G	

- b. Control pressure using normal PRZR spray. if available, to obtain desired results for Step 36a
- b. <u>IF</u> letdown is in service, <u>THEN</u> use auxiliary spray (AOV-296). <u>IF NOT, THEN</u> use one PRZR PORV.

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7 Monitor If CNMT Spray Should Be Stopped:	
a. CNMT spray pumps – ANY RUNNING	a. Go to Step 38.
b. Verify CNMT pressure – LESS THAN 4 PSIG	b. Continue with Step 38. <u>WHEN</u> CNMT pressure less than 4 psig. <u>THEN</u> do Steps 37c through f.
c. Reset CNMT spray	
d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve . switches to CLOSE.
	• AOV-836A • AOV-836B
e. Stop CNMT spray pumps and place in AUTO	
f. Close CNMT spray pump discharge valves	
 MOV-860A MOV-860B MOV-860C MOV-860D 	· ·
• 1104 0000	•

E-3 STEAM GENERATOR	TUBE RUPTURE PAGE 36 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38 Check If Emergency D/Gs Should Be Stopped:	-
a. Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
o Emergency D/G output breakers - OPEN	
o AC emergency bus voltage - GREATER THAN 420 VOLTS	· · · · · · · · · · · · · · · · · · ·
o AC emergency bus normal feed breakers - CLOSED	
b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1. ATTACHMENT D/G STOP)	
39 Minimize Secondary System Contamination:	
a. Isolate reject from hotwell to CST:	a. <u>IF</u> hotwell level increasing. <u>THEN</u> direct RP to sample hotwells for activity.
o Place hotwell level controller (LC-107) in MANUAL at 50%	- -
o Verify hotwell level - STABLE	
 b. Check status of local actions to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G) 	

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E-3	STEAM GENERATOR	R TUBE RUPTURE	REV: 38
			PAGE 37 of
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
		·	
Necess	ze PRZR Heaters As ary To Saturate PRZR At Ruptured S/G Pressure	•	
41 Check	RCP Cooling:	Establish normal coolin (Refer to ATT-15.2, ATT	
a. Chec	k CCW to RCPs:	COOLING).	
R	nnunciator A-7, RCP 1A CCW ETURN HIGH TEMP OR LOW FLOW EXTINGUISHED		
	nnunciator A-15, RCP 1B CCW ETURN HIGH TEMP OR LOW FLOW EXTINGUISHED	•	
b. Chec	k RCP seal injection:		
	abyrinth seal D/Ps – GREATER HAN 15 INCHES OF WATER		
	- OR -		
	CP seal injection flow to ach RCP – GREATER THAN 6 GPM	-	

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E-3	STEAM GENERATOR TUBE RUPTURE			_	
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION	
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN L NOT BE STARTED PRIOR TO A STATUS EVALUATI	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
42 Check RCP Status	
a. Both RCPs – STOPPED	a. Stop all but one RCP and go to step 43.
b. Ensure conditions for starting an RCP.	b. <u>IF</u> conditions can <u>NOT</u> be met, <u>THEN</u> perform the following:
o Bus 11A or 11B energized.	 Verify natural circulation (Refer to ATT-13.0,
o Refer to ATT-15.0, ATTACHMENT RCP START.	ATTACHMENT NC).
	<u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam.
	2) Go to step 43.

This Step continued on the next page.

d. Start one RCP

ο	Increase	e PRZI	lev lev	vel to	b
	greater CNMT].	than	65%	[82%	adverse

- Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING.
- o Energize PRZR heaters as necessary to saturate PRZR water

IF conditions NOT met. THEN continue with step 43. WHEN conditions met. THEN do step 42d.

d. <u>IF</u> an RCP can <u>NOT</u> be started. <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).

<u>IF</u> natural circulation can <u>NOT</u> be verified. <u>THEN</u> increase dumping steam.

EOP:	TIRE:				
E-3		STEAM	GENERATOR	TUBE	RUPTURE
STEP	ACTION/EX	PECTED RESE	PONSE	- RES	SPONSE NOT (

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_ _	STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE:	Adverse CNMT conditions or loss failure of NIS detectors.	of forced air cooling may result in
		eck If Source Range tectors Should Be Energized	:
	а.	Source range channels – DEENERGIZED	a. Go to Step 43e.
	b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10-10 AMPS	 b. Perform the following: 1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration. 2) Continue with Step 44. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 43c through e.
	c.	Check the following: o Both intermediate range channels - LESS THAN 10-10 AMPS -OR-	c. Continue with Step 44. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 43d and e.
		o Greater than 20 minutes since reactor trip	2
	d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).
			<u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 44.
	e.	Transfer Rk-45 recorder to one source range and one intermediate range channel	

E-3 STEAM GENERATOR	TUBE RUPTURE REV: 38
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44 Establish Normal Shutdown Alignment:	
a. Check condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2.
b. Perform the following:	
o Open generator disconnects	
• 1G13A71 • 9X13A73	
o Place voltage regulator to OFF	•
o Open turbine drain valves	
o Rotate reheater steam supply controller cam to close valves	
o Place reheater dump valve switches to HAND	
o Stop all but one condensate pump	
c. Verify adequate Rx head cooling:	<u>-</u>
1) Verify at least one control rod shroud fan – RUNNING	 Manually start one fan as power supply permits (45 kw)
2) Verify one Rx compartment cooling fan - RUNNING	2) Perform the following:
COULING TAIL KOMMING	o Dispatch AO to reset UV relays at MCC C and MCC D.
	o Manually start one fan as power supply permits (23 kw)
d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	1			
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED				
45 Consult TSC To Determine Appropriate Post-SGTR Cooldown Procedure:				
o Go to ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1				
-0R-				
o Go to ES-3.2. POST-SGTR COOLDOWN USING BLOWDOWN. Step 1				
-OR				
o Go to ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP. Step 1				
- END -				
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EOP:	
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E-3 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 4) ATTACHMENT D/G STOP (ATT-8.1)
- 5) ATTACHMENT N2 PORVS (ATT-12.0)
- 6) ATTACHMENT NC (ATT-13.0) .
- 7) ATTACHMENT SEAL COOLING (ATT-15.2)
- 8) ATTACHMENT RCP START (ATT-15.0)
- 9) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 10) ATTACHMENT SD-1 (ATT-17.0)
- 11) ATTACHMENT SD-2 (ATT-17.1)
- 12) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 14) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 15) FOLDOUT

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RED PATH SUMMARY

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F <u>AND</u> RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% |
 [25% adverse CNMT] AND total feedwater flow
 less than 200 gpm
- e. CONTAINMENT CNMT pressure greater than 60 psig

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	STEAM GENERATOR TUBE RUPTURE

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI REINITIATION CRITERIA</u>

Following SI termination, <u>IF</u> either condition listed below occurs, <u>THEN</u> start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

<u>OR</u>

o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN
10% [30% adverse CNMT].

3. <u>SECONDARY INTEGRITY CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

<u>IF</u> RWST level decreases to less than 28%, <u>THEN</u> go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

5. AFW SUPPLY SWITCHOVER_CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

6. <u>MULTIPLE S/G TUBE_RUPTURE_CRITERIA</u>

<u>IF</u> any intact S/G level increases in in an uncontrolled manner <u>OR</u> <u>IF</u> any intact S/G has abnormal radiation, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

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GINNA STATION 23 CONTROLLED COPY NUMBER _

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

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CATEGORY 1.0

REVIEWED BY:____

EOP:	TINE:	
ECA-0.0	LOSS OF ALL AC POWER	- REV: 29
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- A. PURPOSE This procedure provides actions to respond to a loss of all AC power.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure may be entered directly or from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, on the indication that both Bus 14 and Bus 16 are deenergized.
 - 2. SYMPTOMS Which indicate a loss of all AC power are:
 - a. Neither 480 volt AC emergency bus 14 nor 16 available.

ECA-0.0 LOSS OF ALL	L AC POWER PAGE 3 of	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *	
<u>CAUTIO</u>	_	
DUE TO POTENTIALLY EXTREME ENVIRONMENTAL WHEN ENTERING THE INTERMEDIATE BLDG FOR I		
* * * * * * * * * * * * * * * * * * * *		
<u>NOTE</u> : o CSFSTs should be monitored for t should not be implemented.	information only. FR procedures	
o Local actions may require portal devices.	ble lighting and communication	
1 Verify Reactor Trip:	Manually trip reactor.	
o At least one train of reactor trip breakers - OPEN .	<u>IF</u> reactor trip breakers <u>NOT</u> open, <u>THEN</u> perform the following:	
o Neutron flux - DECREASING	a. Open Bus 13 and Bus 15 normal feed breakers.	
o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	b. Verify rod drive MG sets tripped.	
	c. Close Bus 13 and Bus 15 normal feed breakers.	
	d. Reset lighting breakers.	
2 Verify Turbine Stop Valves - CLOSED	Manually trip turbine.	
	<u>IF</u> turbine trip can <u>NOT</u> be verified, <u>THEN</u> close both MSIVs.	

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<u></u>			PAGE 4 of 25
	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
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<u>NOTE</u> : FOLD	OUT page should be open and mo	onitored periodically.	
	S/G ARVs To Control t Approximately 547°F		
4 Stop Bo	oth RCPs		
<u>NOTE</u> : Adve than	rse CNMT values should be used 4 psig or CNMT radiation is g	l whenever CNMT pressure is greater than 10 ⁺⁰⁵ R/hr.	greater
5 Check	If RCS Is Isolated:		
a. PRZR	PORVS - CLOSED	a. <u>lF</u> PRZR pressure les 2335 psig, <u>THEN</u> manu PORVs.	
b. Veri clos	fy RCS isolation valves ed:		
	lace letdown orifice valve witches to CLOSE		
•	AOV - 200A AOV - 200B AOV - 202		
	lace letdown isolation valve witches to CLOSE		
	AOV-371 AOV-427		
i	lace excess letdown solation valve switch to LOSE (AOV-310)		

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ECA-0.0	LOSS OF AL	LAC POWER	REV: 29
			PAGE 5 of 25
STEP ACT	ION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
6 Verify A	dequate TDAFW Flow:		
a. Verify	TDAFW pump - RUNNING	a. Perform the following	ıg:
		 Verify governor v V-3652, latched. 	valve,
		<u>IF</u> governor valve <u>THEN</u> dispatch AO reset valve.	
		2) Manually or local . least one TDAFW p supply valve.	
		• MOV-3505A • MOV-3504A	
	TDAFW pump flow - GREATER 00 GPM	b. Verify proper TDAFW alignment:	valve
		1) TDAFW pump dische (MOV-3996) open.	arge valve
		2) Intact S/G TDAFW control valves op	
		<u>IF NOT, THEN</u> manual valves as necessary	ly align

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LOSS OF ALL AC POWER

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 <u>NOTE</u>: o_ Conditions should be evaluated to (Refer to EPIP-1.0, GINNA STATIC CLASSIFICATION). o AO should increase surveillance restored. 	ON EVENT EVALUATION AND
7 Try To Restore Power to Any Train Of AC Emergency Busses:	
a. Verify emergency D/G aligned for unit operation	a. Manually align switches on rear of MCB.
o Mode switch in UNIT	
o Voltage control selector in AUTO	
b. Check emergency D/Gs - BOTH D/G RUNNING	b. <u>WHEN</u> non-running D/G available for starting. <u>THEN</u> perform the following:
	 Depress D/G FIELD RESET pushbutton
	2) Depress D/G RESET pushbutton
	3) Start D/G
	4) <u>IF</u> D/G starts. <u>THEN</u> go to Step 7c.
	5) <u>IF</u> D/G will <u>NOT</u> start, <u>THEN</u> dispatch AO to locally start emergency D/Gs.
	<u>IF</u> no emergency D/G available, <u>THEN</u> perform the following:
	a) Direct AO to attempt to restore emergency D/G (Refer to ER-D/G.1. RESTORING D/G)
This Step continued on the next page.	b) Go to Step 8.

ECA-0.0 LOSS OF ALL	AC POWER REV: 29
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 7 continued from previous page)	-
c. Check D/G voltage and frequency	
1) Voltage - APPROXIMATELY 480v	 Adjust voltage control to restore voltage to approximately 480v
2) Frequency - APPROXIMATELY 60 Hz	 Adjust governor to restore frequency to approximately Hz
d. Verify adequate D/G cooling	d. Manually energize busses and start SW Pumps.
o Bus 17 and/or Bus 18 – ENERGIZED	<u>IF</u> adequate cooling can <u>NOT</u> b
o One SW Pump running for each	supplied to a running D/G . TH perform the following:
running D/G	 Pull stop the D/G <u>AND</u> immediately depress associated VOLTAGE SHUTDOW pushbutton.
	2) Align alternate cooling (Refer to ER-D/G.2. ALTERN COOLING FOR EMERGENCY D/Gg
e. Verify at least one train of AC emergency busses - ENERGIZED	e. Manually energize AC emergenc busses.
Bus 14 and Bus 18Bus 16 and Bus 17	<u>IF</u> Bus 14 <u>AND</u> Bus 16 are deenergized, <u>THEN</u> go to Step
f. Return to procedure and step in effect	

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LOSS OF ALL AC POWER

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* * *	<u>CAUTION</u>
	HEN POWER IS RESTORED TO BUS 14 AND/OR BUS 16, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 27.
F	F AN SI SIGNAL EXISTS OR IF AN SI SIGNAL IS ACTUATED DURING THIS PROCEDURE. IT SHOULD BE RESET TO PERMIT MANUAL LOADING OF EQUIPMENT ON AN C EMERGENCY BUS.
* * *	• • • • • • • • • • • • • • • • • • • •
	stablish The Following . quipment Alignment:
ε	. Pull stop AC emergency bus loads
	 RHR pumps CNMT RECIRC fans CNMT spray pumps SI pumps CCW pumps Charging pumps MDAFW pumps
E	. Evaluate non-vital loads (Refer to ATT-8.3. ATTACHMENT NONVITAL)
c	e. Place non-running SW pump switches to STOP, then return to AUTO
đ	. Place switch for MOV-313, RCP seal return isolation valve, to CLOSE
E	e. Momentarily place to CLOSE RCP CCW return valves
	• MOV-759A • MOV-759B

STEP ACTION/EXPECTED RESPONSE	AC POWER PAGE 9
STEP ACTION/EXPECTED RESPONSE	
STEP ACTION/EXPECTED RESPONSE	
	RESPONSE NOT OBTAINED
<u>NOTE</u> : Temporary power may be provided to ER-ELEC.4 and to Bus 13 by performi Shift Supervisor's discretion.	
9 Try To Restore Offsite Power:	
a. Consult RG&E Energy Control Center to determine if either normal offsite power supply - AVAILABLE	a. <u>IF</u> normal offsite power supp <u>NOT</u> readily available. <u>THEN</u> perform the following:
o 12B transformer via breaker 76702	 Restore IA system using the Diesel Air Compressor (Restore ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
- OR -	
o 12A transformer via breaker 75112	2) Evaluate Main transformer backfeed for long term concerns (Refer to ER-ELEC EMERGENCY OFFSITE BACKFEE) VIA MAIN & UNIT TRANSFORM
	3) Go to Step 10.
b. Reset SI, if necessary	
c. Restore offsite power (Refer to ER-ELEC.1, RESTORATION OF	
OFFSITE POWER)	
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	CTION/EXPECTED RESPONSE	RESPONSE NOT	OBTAINED]	<u>-</u>		
Isolat	te Local Actions To e RCS And To Provide g To Vital Areas And ent	-					
Cont	all Reactor Protection an rol System rack doors in t rol Room.						
open	ct Security personnel to the following vital area s to increase cooling:						
• In (A • In (A Dr • In	ntrol Room Door S51 termediate Bldg Door S37 FW pump area) termediate Bldg Door F36 utomatic fire door, Rod ive MG set area) termediate Bldg Door S44 team Header area)						
RCP ATT-	atch AO To Locally Isolate Seals and BASTs (Refer to 21.0, ATTACHMENT RCS ATION)						
cool (Ref	atch AO to align backup ing water to TDAFW Pump er to ATT-5.2, ATTACHMENT WATER COOLING TO TDAFW PU	MP)					

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ECA-0.0 LOSS OF AL	L AC POWER PAGE 11 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11 Isolate Makeup And Reject From Hotwell To CST By Placing Hotwell Level Controller (LC-107) In Manual AT 50%	<u>IF</u> valves can <u>NOT</u> be manually closed, <u>THEN</u> dispatch AO to locally isolate makeup and reject lines. • Makeup isolation V-4058 • Reject isolation V-4055
 12 Isolate S/G: a. Manually close both MSIVs b. Depress MANUAL pushbuttons <u>AND</u> manually close MFW flow control valves MFW regulating valves MFW bypass valves c. Place MCB master switch for S/G blowleys and members to blowleys 	<u>IF</u> valves can <u>NOT</u> be manually closed. <u>THEN</u> dispatch AO to locally isolate the affected flow path.
blowdown and sample valves to CLOSE	

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· · · · · ·				* <u></u>
STEP	ACTION/EXPECTED RESPONS	E	RESPONSE NOT OBTAINED]
LJ		I		٢
* * * *	* * * * * * * * * * * * * *	CAUTION	* * * * * * * * * * * *	****
	TED OR RUPTURED S/G THAT			
SUPPL	Y TO THE TDAFW PUMP MUST B	E MAINTAINED	FROM AT LEAST ONE S/G.	
* * * *	* * * * * * * * * * * * *	* * * * * * *	* * * * * * * * * * * *	******
13 Ch	eck If S/G Secondary S Intact:	ide !	Perform the following:	
	Pressure in both S/Gs - S	TABLE	a. <u>IF</u> any S/G pressure in an uncontrolled m	decreasing manner OR
	OR INCREASING		completely depressur isolate faulted S/G	rized, <u>THEN</u> unless
0	Pressure in both S/Gs - G THAN 110 PSIG	REATER	needed for RCS coold	
			 Close faulted S/G discharge valve. 	; MDAFW pump
			 S/G A, MOV-4007 S/G B, MOV-4008 	
			2) Close faulted S/G	
	· .		control valve.	
			 S/G A, AOV-4297 S/G B, AOV-4298 	
			 Verify faulted S/ controller in MAN output at 0%. 	'G ARV NUAL with
			• S/G A, AOV-3411 • S/G B, AOV-3410	L
			4) Pull stop faulted pump steam supply	l S/G TDAFW 7 valve.
	· · · · ·		 S/G A. MOV-3505 S/G B. MOV-3504 	
			<u>IF</u> valve(s) can <u>NOT</u> manually, <u>THEN</u> dispa locally close valve isolate flow.	atch AO to
	· · ·		b. Dispatch AO to compl	lete faulted
			S/G isolation (Refer ATT-10.0, ATTACHMENT S/G).	r to

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ECA-0.0	LOSS OF AL		EV: 29
			AGE 13
14 Check o Disp loce	CTION/EXPECTED RESPONSE If S/G Tubes Are Intact: batch RP tech or A0 to illy check steamline ation - NORMAL	 RESPONSE NOT OBTAINED Try to identify ruptured S Continue with Step 15. WHE ruptured S/G identified. T perform the following: a. Isolate ruptured S/G un needed for RCS cooldown 1) Close ruptured S/G M discharge valve. S/G A. MOV-4007 S/G B. MOV-4008 2) Pull stop ruptured S/G T control valve. S/G A. A0V-4297 S/G B. A0V-4298 4) Adjust ruptured S/G prese than 1050 prig. THEN ruptured S/G B. A0V-3411 S/G B. A0V-3411 S/G B. A0V-3411 S/G B. A0V-3505A S/G B. MOV-3505A S/G B. MOV-3504A IF valve(c) can NOT be manually. THEN dispatch locally close valve(s) isolate flow. b. Dispatch A0 to complete S/G isolation (Refer to ATT-16.0. ATTACHMENT RU S/G). 	EN THEN 1 less 1: 1 DAFW pur S/G MDAFW TDAFW flo ARV osig in sure les y ensure osed. S/G TDAFW alve. closed h AO to to conto

ECA-0.0	LOSS	OF ALL A	C POWER	REV: 29 PAGE 14 of 2
				<u>I</u>
STEP AC	TION/EXPECTED RESPONSE	[RESPONSE NOT OBTAIN	ED
* * .* * *	* * * * * *_* * * * * *	CAUTION		* * * * * * * * *
AFW PUMPS.	EL DECREASES TO LESS THA USING FIRE OR CITY WATE VATER SUPPLY TO AFW PUME	R. WILL BE		
* * * * * *	* * * * * * * * * * *	* * * * *	********	* * * * * * * * *
NOTE: TDAF	V pump AOV flow control	AOVs may d	lrift open on loss o	f IA.
*15 Monitor	Intact S/G Levels:			
	ow range level - GREATEF 7% [25% adverse CNMT]	٤ ٤ 	a. Maintain maximum , narrow range leve 7% [25% adverse C least one S/G.	l greater than
	rol AFW flow by throttl; V flow control valves	ing i	. Control AFW flow TDAFP discharge M	
	G A. AOV-4297 G B. AOV-4298		<u>IF</u> MOV-3996 can <u>N</u> controlled, <u>THEN</u> locally control A throttling TDAFW valves.	dispatch AO to FW flow by
·			 S/G A. AOV-4297 S/G B. AOV-4298 	
			<u>IF</u> valves can <u>NOT</u> <u>THEN</u> control AFW starting and stop	flow by
narr	rol AFW flow to maintair ow range level between 1 adverse CNMT] and 50%		e. <u>IF</u> narrow range 1 intact S/G contin in an uncontrolle return to Step 14	ues to increase d manner, <u>THEN</u>

•

ECA-0.0	LOSS OF AL	L AC POWER	
			PAGE 15 of
·			
STEP ACT	ION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
degas	e loss of power is expected t sing of main generator should e available (Refer to ATT-8.2	l commence as soon as perso	
16 Check D	C Bus Loads:		
pump /	control switches for MFW AC oil pumps to OFF (allows to stop DC oil pumps)		ر
b. Stop a loads	all large non-essential DC		
	aluate DC loads (Refer to F-8.0, ATTACHMENT DC LOADS).	• ·	
	EN turbine is stopped, THEN rform the following:	· · ·	
a)	Locally close Turbine backup seal oil reg outlet valve V-5475J.		
ь)	Stop Turbine DC lube oil pump (within l hour).		
	DC bus voltage - GREATER 105 VOLTS DC	c. <u>IF</u> either DC bus les 105 volts DC. <u>THEN</u> r ER-ELEC.2. RECOVERY	efer to
• Bus • Bus		A or B DC BUS.	FROM E033 OF
	t electricians to locally or DC power supply		

EOP:	TIRE:				_
ECA-0.0	LOSS OF ALL AC POWER	REV:	29		
		PAGE	16	of	25

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
SIEF ACTION/EAFECTED RESPONSE	RESPONSE NOT OBTAINED
	-
17 Verify Source Range Detector(s) - ENERGIZED	Dispatch personnel with relay rack key to turn off 125 VDC power
	switches in REACTOR PROTECTION
• N-31 • N-32	racks RLTR-1 and RLTR-2 to deenergize source range block
- N 52	relays.
	* * * * * * * * * * * * * * * * * * * *
CAUTION	
WHEN POWER IS RESTORED TO BUS 14 AND/OR BU CONTINUE STARTING WITH STEP 27.	S 16, RECOVERY ACTIONS SHOULD
* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *
18 Check CST Level - GREATER THAN 5 FEET	Initiate makeup to CSTs using fire or city water as a source. (Refer to ER-AFW.1. ALTERNATE WATER SUPPLY TO AFW PUMPS).

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EOP: TITLE:			REV: 29
ECA-0.0	LOSS OF ALL AC POWER	REV. 25	
			PAGE 17 of
STEP ACTION/H	XPECTED RESPONSE	RESPONSE NOT OBTAIN	IED
* * * * * * * * * * *	CAUTI	<u>LON</u>	* * * * * * * * *
	SHOULD BE MAINTAINED O SI ACCUM NITROGEN INTO	GREATER THAN 200 PSIG TO THE RCS.	PREVENT
CNMT] IN AT L	EAST ONE INTACT S/G.]	INTAINED GREATER THAN 7% IF LEVEL CANNOT BE MAINTA JNTIL LEVEL IS RESTORED I	INED, S/G
* * * * * * * * *	* * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * * * *
	s should be depressuriz ry loss.	zed at maximum rate to mi	nimize RCS
occur d		actor vessel upper head v of S/Gs. Depressurizati se occurrences.	
	nitrogen pressure shou changed as necessary.	ild be monitored and nitr	ogen supply
	pressurization Of To 300 PSIG:	•	
a. Check S/G narrow range levels - GREATER THAN 17% [25% adverse CNMT] IN AT LEAST ONE S/G	a. Perform the follo	wing:	
	 Maintain maxim until narrow r greater than 1 CNMT] in at le 	ange level 7% [25% adverse	
	2) Continue with narrow range 1 than 17% [25% in at least on Steps 19b and	evel greater adverse CNMT] e S/G, <u>THEN</u> do	
b. Manually d	ump steam from intact ximum rate using S/G	b. Locally dump stea S/Gs at maximum r	m from intact

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ECA-0.		LAC POWER PAGE 18 of
STEP <u>NOTE</u> :	in failure of NIS detectors.	RESPONSE NOT OBTAINED s of forced air cooling may result d. <u>THEN</u> NIS SUR meters will <u>NOT</u> be
Sul	itor Reactor For ocriticality: Verify Subcriticality using the	a. <u>IF</u> unable to verify
	<pre>following indications: 1) Check source range(s), N-31 AND N-32 o Indicator - ON SCALE</pre>	subcriticality using NIS. <u>THEN</u> perform the following: o Control S/G ARVs to stop S/G depressurization and allow RCS to heat up.
	o Power - STABLE OR DECREASING	o Direct RP to sample RCS and PRZR for boron concentration.
	 2) Check intermediate range. N-35 o Indicator - ON SCALE o Power - STABLE OR DECREASING 	o Request plant staff assistance in evaluating core reactivity status
	 3) Check power range. N-41 and N-43 o Indicators - LESS THAN 5% o Power - STABLE OR DECREASING 	

ECA-0.0	TITLE:	ALL AC POWER	REV: 29
			PAGE 19 of 25
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	3D
	essurization-of S/Gs will re t to permit manual loading o		
21 Check	SI Signal Status:		
a. Any	SI annunciator - LIT	a. Go to Step 25. <u>WH</u> actuated, <u>THEN</u> do 23 and 24.	
b. Rese	t SI		
22 Verify	CI And CVI:		
a. CI a	nd CVI annunciators – LIT	a. Depress manual CI	pushbutton.
IS • An	nunciator A-26, CNMT OLATION nunciator A-25, CONTAINMENT NTILATION ISOLATION		
	fy CI and CVI valve status ts – BRIGHT	b. Manually close CI valves. <u>IF</u> valves verified closed by indication. <u>THEN</u> d locally close valv ATT-3.0, ATTACHMEN	s can <u>NOT</u> be MCB Lispatch AO to Yes (Refer to
	RECIRC fan coolers SW et valve status lights - HT	c. Dispatch AO to loc valves.	ally fail open
	V-4561 V-4562		
	fy RHR Pump Suction from Sump B valves - CLOSED	d. <u>IF</u> sump recirculat progress. <u>THEN</u> mar valves.	
	V-850A V-850B	<u>IF</u> valves can <u>NOT</u> closed by MCB indi dispatch AO to loc valves.	.cation, <u>THEN</u>

OP: TITLE:	. REV: 29
ECA-0.0 LOSS OF ALI	L AC POWER
	PAGE 20 of 2
•	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23 Check If S/G Depressurization Should Be Stopped:	•
a. Check RCS cold leg temperatures - GREATER THAN 315°F	a. Perform the following:
	 Control S/G ARVs to stop S/G depressurization.
	2) Go to Step 24.
b. Check S/G pressures – LESS THAN 300 PSIG	b. Continue with Step 24. <u>WHEN</u> S/G pressure decreases to less than 300 psig, <u>THEN</u> do Step 23c and d.
c. Check IA supply:	c. Control S/G ARVs in manual to
o Pressure – GREATER THAN 60 PSIG	maintain S/G pressures at 300 psig
o Pressure - STABLE OR INCREASING	<u>IF</u> manual control is <u>NOT</u> available. <u>THEN</u> locally control S/G ARVs to maintain S/G pressures at 300 psig.
d. Control S/G ARVs to maintain S/G pressures at 300 psig IN AUTO	d. Control S/G ARVs in manual to maintain S/G pressures at 300 psig
	<u>IF</u> manual control is <u>NOT</u> available, <u>THEN</u> locally control S/G ARVs to maintain S/G pressures at 300 psig.
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ECA-0.0 LOSS OF ALI	
	PAGE 21 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24 Check CNMT Pressure - HAS REMAINED LESS THAN 28 PSIG	<u>IF</u> CNMT pressure is less than 28 psi,THEN perform the following:
o Annunciator A-27, CNMT SPRAY - EXTINGUISHED	a. Reset CNMT spray.
o CNMT pressure indicators – LESS THAN 28 PSIG	b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor.
	<u>IF NOT. THEN</u> continue with step 25. <u>WHEN</u> CNMT pressure less than 28 psig, <u>THEN</u> reset CNMT spray and place CNMT spray pump discharge valve switches to CLOSE.
25 Check Core Exit T/Cs - LESS THAN 1200°F	<u>IF</u> core exit temperatures greater than 1200°F and increasing, <u>THEN</u> go to SACRG-1. SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE. step 1.
26 Check If AC Emergency Power Is Restored - BUSSES 14 AND/OR 16 ENERGIZED	Continue to control RCS conditions and monitor plant status:
AND/OR IS ENERGIZED	a. Check status of desired actions:
	o AC power restoration
	o ARV nitrogen pressure
	o Diesel air compressor to IA system
	o RCP seal isolation
	o DC power supply
	b. Return to Step 13.
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E	ECA-0.0	TITLE:	LOSS 0	F ALL A	C POWER	REV:	29	
		<u>`````</u>				PAGE	22	of 2.
, Г	STEP AC	CTION/EXPECTED R	ESPONSE	{	RESPONSE NOT OBTAINED]		
	27 Manual Stabil	ly Control S/(ize S/G Press	G ARVs To ires	D I	Locally control S/G ARV	Έ.		
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					•			
;								

ECA-0.0 LOSS O	F ALL AC POWER
	PAGE 23 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : SW isolation may-occur_when p	ower is restored to AC emergency busses.
28 Verify SW System Operation:	
a. Check Bus 17 and Bus 18 – AT LEAST ONE ENERGIZED	a. Perform the following:
LEAST ONE ENERGIZED	1) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	3) Go to Step 29.
b. Verify two SW pumps – RUNNING	b. <u>IF</u> normal power available, <u>THEN</u> establish two SW pumps running.
•	<u>IF</u> normal power <u>NOT</u> available, <u>THEN</u> establish one SW pump running for each operating D/G.
	<u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	 Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	<u>IF</u> only one SW pump running. <u>THEN</u> perform the following:
	1) Manually perform SW isolation.
	2) Refer to AP-SW.2, LOSS OF SERVICE WATER.

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ECA-0		PAGE 24	of	2
<u>.</u>				
		1		
STEP	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED			
* * *		* * * * *	r 147 1	*
	CAUTION			
THE L	DADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEP	ED THE		
CAPAC	TY OF THE POWER SOURCE.			
* * *		* * * * *	* *	r
	rify Following Equipment Manually load equipment aded On Available AC supply permits.	as power		
Em	ergency Busses:			
ο	480 volt MCCs - ENERGIZED .			
	• MCC C from Bus 14			
	• MCC D from Bus 16			
ο	Verify instrument busses – ENERGIZED			
	 Bus A from MCC C (A battery) Bus B from MCC C 			
	• Bus C from MCC D (B battery)			
0	Dispatch personnel to verify proper operation of battery			
	chargers			
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EOP:	TIRE:		•	R	EV: 29
ECA-0	.0 LOSS OF ALI	, AC	POWER	P	AGE 25 of 2
•				_	
STEP	ACTION/EXPECTED RESPONSE	<u>L</u> i	RESPONSE NOT OBTAINED	┢	
30 Se	lect Recovery Procedure:				
a.	Check RCS subcooling based on core exit T/Cs - GREATER THAN	а.	Go to ECA-0.2, LOSS		
	O°F USING FIG-1.0, FIGURE MIN SUBCOOLING		POWER RECOVERY WITH Step 1.	21	REQUIRED,
ь.	Check PRZR level - GREATER THAN	Ь.	Go to ECA-0.2, LOSS		
	10% [30% adverse CNMT]		POWER RECOVERY WITH Step 1.	SI	REQUIRED,

c. Check SI and RHR Pumps - NONE

d. Go to ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI

REQUIRED, Step 1

RUNNING

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c. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. Step 1.

-END-

EOP:	
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ECA-0.0 APPENDIX LIST

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TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT DC LOADS (ATT-8.0)
- 3) ATTACHMENT FAULTED S/G (ATT-10.0)
- 4) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 5) ATTACHMENT CI/CVI (ATT-3.0)
- 6) ATTACHMENT NONVITAL (ATT-8.3)
- 7) ATTACHMENT GEN DEGAS (ATT-8.2)
- 8) ATTACHMENT RCS ISOLATION (ATT-21.0)
- 9) ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP (ATT-5.2)
- 10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 11) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 12) FOLDOUT

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FOLDOUT PAGE

1. LOSS OF SW CRITERIA -

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

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ECA-0.1	LOSS OF ALL AC POWER RECOVERY WITHOUT SI	REV:	24
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GINNA STATION

RESPONSIBLE MANAGER

CATEGORY 1.0

REVIEWED BY:_____

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ECA-0.1	LOSS OF ALL AC POWER RECOVERY WITHOUT SI	REV: 24
ECA-0.1	REQUIRED	PAGE 2 of 21

- A. PURPOSE This procedure provides actions to use normal operational systems to stabilize plant conditions following restoration of AC emergency power.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is not required.

ECA-0.1	TITLE: LOSS OF ALL AC POWER RE		RY WITHOUT SI	REV: 24
		JIRED		PAGE 3 of 2
				1
	TION/EXPECTED RESPONSE		SPONSE NOT OBTAINED	
	<u>CAUTIO</u>	* * * <u>N</u>	* * * * * * * * * *	* * * * * * *
	IGNAL IS ACTUATED PRIOR TO PERI DULD BE RESET TO PERMIT MANUAL BUS.			-
		• • •	* * * * * * * * *	* * * * * * *
	SFSTs should be monitored for t hould not be implemented prior			
	dverse CNMT values should be us reater than 4 psig or CNMT rad:			
o F	OLDOUT page should be open and	monito	pred periodically.	
1 Check I Status	RCP Seal Isolation			
a. RCP - CL	seal injection needle valves OSED	١	Dispatch AO to local valves before starti pump.	
• V- • V-				
	CCW return valver - CLOSED V-759A	1	<u>lF</u> valves open or po known, <u>THEN</u> check CC	
	V-759K		status:	ምዚርንነ ቀይ ተቀ
			l) <u>IF</u> pump running. Step 2.	ITEN go to
			2) <u>IF</u> pump <u>NOT</u> runni manually close va	
			<u>IF</u> valve(s) can <u>N</u> closed. <u>THEN</u> plac for RCP thermal b outlet valves to	e switches arrier CCW
			 AOV-754A AOV-754B 	

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ECA-0.1	RECOVERY WITHOUT SI EQUIRED PAGE 4 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2 Check CI Annunciator A-26,	Porform the fallowing.
CONTAINMENT ISOLATION -	Perform the following:
EXTINGUISHED	a. Depress CI reset pushbutton
	b. Verify annunciator A-26. CONTAINMENT ISOLATION. extinguished.

EOP:			
EOP: E	CA-	0.3	1

TITLE:

LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3 Establish IA to CNMT:	
 a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED o Bus 15 normal feed - CLOSED b. Check SW pumps - AT LEAST TWO PUMPS RUNNING 	 a. Perform the following: Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie b. Manually start SW pumps as power supply permits (257 kw each). IF no SW pumps are available. THEN perform the following: Pull stop any D/G that is NOT supplied by alternate cooling. AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. Refer to ATT-2.4. ATTACHMENT NO SW PUMPS. IF less than two SW pumps running. THEN perform the following: Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR).
c. Verify turbine building SW	2) Go to Step 3d.c. Perform the following:
 Icolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 	 Manually align valves. Dispatch AO to locally reset compressors as necessary.

ECA-0.1	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 3 continued from previous page)	
d. Start adequate air compressor(s) (75 kw each)	d. <u>IF</u> electric air compressors can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e. Check IA supply:	e. Perform the following:
o Pressure - GREATER THAN 60 PSIG	 Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
o Pressure - STABLE OR INCREASING	2) Continue with Step 4. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 3f and g.
f. Reset both trains of XY relays for IA to CNMT (AOV-5392) if necessary	
g. Verify IA to CNMT AOV-5392 - OPEN	

EOP:	LOSS OF ALL AC POWER	RECOVERY WITHOUT SI	REV: 24
ECA-0.1		QUIRED	PAGE 7 of
<u> </u>			
	OTION (EVADOTED DECRONCE	DECRONCE NOT OPTAINED	Π
- STEP - A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
* * * * * *			* * * * * * * *
	CAUTI	ON	
	PLACED ON THE ENERGIZED AC EM OF THE POWER SOURCE.	ERGENCY BUS SHOULD NOT EXC	EED THE
* * * * * * ·		• • • • • • • • • • • • •	* * * * * * * * ,
4 Manual Equipm Busses	ly Load Following ent On AC Emergency		
a. Stai	rt one CCW pump (122 kw)		
b. Ener perr	rgize MCCs as power supply nits		
• M(• M(CC A from Bus 13 CC B from Bus 15 CC E from Bus 15 CC F from Bus 15		
	ify instrument bus D RGIZED	c. Restore power to in D from MCC B or MCC (maintenance supply	A
	l bus 15 restored. <u>THEN</u> reset trol room lighting		
e. Star fan	rt at least one CNMT RECIRC		
	tore Rx head cooling as power bly permits		
	Start one Ex compartment	1) Perform the foll	owing:
,	cooling far. (23 kw each)	o Dispatch AO t relays at MCC	
		o Manually star power supply (23 kw)	
	Start both control rod shroud Eans (45 kw each)	2) Manually start a fan (45 kw)	t least one
shui	batch AO to establish normal down alignment (kefer to -17.0, ATTACHMENT SD-1)		
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LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 Ensure seal injection needle valves to both RCPs isolated
	 RCP A, V-300A RCP B, V-300B
	2) Ensure HCV-142 open, demand at 0%.
b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
o LCV-112B - OPEN	IF LCV-112B can <u>NOT</u> be opened,
o LCV-112C - CLOSED	<u>THEN</u> dispatch AO to locally ope V-358, manual charging pump suction from RWST (charging pum room).
	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AU to close V-268 to isolate marging pumps B and C from WCT (charging pump room).
Start charging pumps (75 kw much) as necessary and adjust charging flow to restore PRZR level	

ECA-0.1	RECOVERY WITHOUT SI QUIRED PAGE 9 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6 Monitor SI Initiation Criteria:	
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Go to ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. Step 1.
b. PRZR level - GREATER THAN 10% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level.
	IF PRZR level can <u>NOT</u> be maintained, <u>THEN</u> go to ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
7 Check PRZR Level - GREATER THAN 20% [40% FOR ADVERSE CONTAINMENT]	Control charging flow as necessary.

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:	ECP: TITLE: ECA-0.1 LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED PAGE 10 of 21
۱ ۱	
	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
	<u>CAUTION</u>
	 IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).
	 IF S/G NR LEVEL DECREASES TO LESS THAN 7% [25% ADVERSE CNMT] AND FEED FLOW IS LESS THAN 200 GPM. THEN THE MDAFW PUMPS SHOULD BE MANUALLY LOADED ON AC EMERGENCY BUS TO SUPPLY WATER TO THE S/G(S).
	<u>NOTE</u> : o If MDAFW pump operation is not required, pump switches should be maintained in PULL-STOP to prevent automatic start.
	o TDAFW pump flow control AOVs may drift open on loss of IA.
	* 8 Monitor Intact S/G Levels:
\mathcal{O}	a. Narrow range level - GREATER THAN /% [25% adverse CNMT] a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
	<u>IF</u> feed flow less than 200 gpm. <u>THEN</u> perform the following:
	 Verify MDAFW pump discharge valves open.
	 MOV-4007 MOV-4008
	2) Manually start MDAFW pumps as necessary (223 kw each).
	b. Control feed flow to maintain, narrow range level between 1/% [25% adverse CNMT] and 52%
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EOP:		
EOP: EC	:A-0	.1

TITLE:

LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

REV: 24

.

PAGE 11 of 21

9 Establish S/G Pressure Control: a. Adjust S/G ARV controllers to maintain existing S/G pressure b. Verify S/G ARV controllers in AUTO c. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<pre>maintain existing S/G pressure b. Verify S/G ARV controllers in AUTO c. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2 IF AN SI SIGNAL IS ACTUATED AFTER THE SI PUMP SWITCHES ARE PLACED IN AUTO. THEN ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. SHOULD BE PERFORMED. IOTE: Safeguards pump switches chould be placed in AUTO only if associated bus is energized. Place Following Pump Switches In AUTO: SI pumps RHR pumps </pre>		
AUTO c. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2		· .
ATTACHMENT SD-2 <u>CAUTION</u> IF AN SI SIGNAL IS ACTUATED AFTER THE SI PUMP SWITCHES ARE PLACED IN AUTO. THEN ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. SHOULD BE PERFORMED. <u>NOTE</u> : Safeguards pump switches should be placed in AUTO only if associated bus is energized. 10 Place Following Pump Switches In AUTO: • S1 pumps • RHR pumps		
<pre>IF AN SI SIGNAL IS ACTUATED AFTER THE SI PUMP SWITCHES ARE PLACED IN AUTO. THEN ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. SHOULD BE PERFORMED. <u>NOTE</u>: Safeguards pump switches should be placed in AUTO only if associated bus is energized. 10 Place Following Pump Switches In AUTO: S1 pumps RHR pumps</pre>	c. Dispatch AO to perform ATT-17.1 ATTACHMENT SD-2	
THEN ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED. SHOULD BE PERFORMED. NOTE: Safeguards pump switches should be placed in AUTO only if associated bus is energized. 10 Place Following Pump Switches In AUTO: S1 pumps • S1 pumps RHR pumps	<u>CAU</u>	<u> </u>
<pre>bus is energized. 10 Place Following Pump Switches In AUTO: • S1 pumps • RHR pumps</pre>	THEN ECA-0.2. LOSS OF ALL AC POWER REG	
<pre>bus is energized. 10 Place Following Pump Switches In AUTO: • S1 pumps • RHR pumps</pre>		
In AUTO: • Sl pumps • RHR pumps		be placed in AUTO only if associated
• RHR pumps		
	• RHR pumps	

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : FR procedures may now be implemen	ted as necessary.
11 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	1) <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAG SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	3) Go to Step 17.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves. <u>IF</u> valves must be locally operated <u>THEN</u> continue with Step 17.
 MOV-4615 and MOV-4/34 MOV-4616 and MOV-4/35 	WHEN SW restored to AUX BLDG. THEN do Steps llc through 16.

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ECA-0.1	OSS OF ALL AC POWER	RECOVERY WI EQUIRED	THOUT SI REV: 24 PAGE 13 of
STEP ACTION	/EXPECTED RESPONSE	RESPONS	E NOT OBTAINED
c. Verify CN annunciat	ontinued from previous p MT RECIRC fan For C-2, HIGH WRE ALARM - EXTINGUISHED	c. Perfo	rm the following: termine required SW flow to W HXs per table:
	SW DISCHARGE Alignment	CCW HXS IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30-33" d/p across each HX
	Alternate	_ 1	95–100" d/p across in-service HX
	L <u></u>		rect AO to adjust SW flow required value
		o	<u>IF</u> on normal SW discharge:
			• V-4619. CCW HX A • V-4620. CCW HX B
			- OR -
		o	<u>lF</u> on alternate SW discharge:
			 V-4619C. CCW HX A V-4620B. CCW HX B

EOP: TITLE: LOSS OF ALL AC POWER R	ECOVERY WITHOUT SI REV: 24
ECA-0.1 LOSS OF ALL AC FOWER R	PAGE 14 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Check If Normal CVCS Operation Can Be Established	
a. Verify IA restored:	a. Continue with Step 17. <u>WHEN</u> IA restored. <u>THEN</u> do Steps 12
o IA to CNMT (AOV-5392) - OPEN	through 16.
o IA pressure – GREATER THAN 60 PSIG	
b. Charging pump - ANY RUNNING	b. Continue with Step 17. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 13 through 16.
13 Verify PRZR Level - GREATER THAN 20% [40% adverse CNMT]	Continue with Step 17. <u>WHEN</u> PRZR level increases to greater than 20% [40% adverse CNMT], <u>THEN</u> do Steps 14 through 16.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	ļ
14 Establish Normal Letdown:	Consult TSC to determine letdown should be place	
a. Establish charging line flow to REGEN Hx GREATER THAN 20 GPM		
b. Place the following switches to CLOSE:		·
 Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) AOV-371, letdown isolation 		
 AOV-371, Tetadown isolation valve AOV-427, loop B cold leg to REGEN Hx 		
c. Place letdown controllers in MANUAL at 40% open		
TCV-130PCV-135		
d. Reset both trains of XY relays for AOV-371 and AOT 427 if necessary		
e. Open AOV-3/1 and AOV 42/		
<pre>f. Open letdown aritice valves as necessary</pre>		
g. Place PCV 19% in AUT% of 25% priz		
h. Place TCV 13: if AUTC at the normal setpoint		
 Adjust charging pump speed and HCV-142 as necessary 		

۱	EOP: TITLE:	
1	FCA-0 1 LOSS OF ALL AC POWER RE	
;	REQU	IRED PAGE 16 of 21
	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	15 Check VCT Makeup System:	
	a. Verify the following: 1) Boric acid and RMW flow control valves - SET FOR REQUIRED CSD CONCENTRATION (Refer to FIG-2.0, FIGURE SDM)	a. <u>IF</u> VCT auto makeup can <u>NOT</u> be established, <u>THEN</u> manually control VCT level (Refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION).
	 At least one BA and RMW pump in AUTO RMW mode selector switch in AUTO RMW control armed - RED LIGHT LIT 	
	b. Check VCT level	b. Manually increase VCT makeup flow as follows:
	o Level - GREATER THAN 20% OF o Level STABLE OF INCREASING	 Ensure BA transfer pumps and RMW pumps running. <u>IF NOT</u>. <u>THEN</u> dispatch AO to reset MCC C and MCC D UV lockouts as necessary. Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. Increase boric acid flow as necessary. <u>IF VCT level can NOT be</u> restored. <u>THEN go to Step 17.</u>
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ECA-0.1	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16 Check Charging Pump Suction Aligned To VCT:	
a. VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:
	 Ensure charging pump suction aligned to RWST:
	o LCV-112B open
	o LCV-112C closed
	2) Continue with Step 17. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 16b.
b. Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
o LCV-112C - OPEN	
o LCV-112B · CLOSED	
17 Control PRZR Level:	
a. Check letdown - IN SERVICE	н. Stop and start charging pumps an necessary to control PRZR level.
b. Maintain PRZP level between 20% [40% adverse CNMT] and 50%	

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EOP:	TITLE:	REV: 24	
ECA-0.1	LOSS OF ALL AC POWER	RECOVERY WITHOUT SI DUIRED PAGE 18	~
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(<u> </u>		
STEP A	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
		spray flow may be increased by AOV-294 and normal PRZR spray valves.	
• • •	When using a PRZR PORV select	one with an operable block valve.	
18 Establ Contro	lish PRZR Pressure		
a. Che	ck letdown - IN SERVICE	a. Perform the following:	
		1) Use PRZR heaters and one PRZ PORV to maintain RCS pressur	
		<u>IF</u> IA <u>NOT</u> available, <u>THEN</u> Refer to ATT-12.0, ATTACHMEN N2 PORVS to operate PORV.	IT
		2) Go to Step 19.	
spr	PRZR heaters and auxiliary ay valve (AOV-296) to ntain RCS pressure		
19 Verify	V Natural Circulation:	Increase dumping steam from intact S/Gs.	:
exi USI	subcooling based on core t T/Cs - GREATER THAN 0°F NG FIG-1.0, FIGURE MIN COOLING	5705.	
	pressures - STABLE OR REASING		
	hot leg temperatures - BLE OR DECREASING		
	e exit T/Cc - STABLE OR REASING		
	cold leg temperatures - AT		

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ECA-0.1	LOSS OF ALL AC POWER R REQ	ECOVERY WITHOUT SI UIRED	REV: 24 PAGE 19 o
NOTE: Adverse	ON/EXPECTED RESPONSE e CNMT conditions or loss of e of NIS detectors.	RESPONSE NOT OBTAINED	J
Detector	Source Range s Should Be Energized:		· . . · .
a. Source DEENER(range channels - SIZED	a. Go to Step 20e.	
	Intermediate range flux - CHANNEL LESS THAN MPS	 b. Perform the following 1) <u>IF</u> neither interm channel is decreased initiate boration 2) Continue with Stee flux is LESS THAN on any operable of do Steps 20c throom and s	ediate range sing <u>THEN</u> p 21. <u>WHEN</u> 10 ⁻¹⁰ amps channel, <u>THEN</u>
o Botl char 10 ⁻¹ o Grea	the following: n intermediate range nels - LESC THAN 10 AMPC -OE -OE ater than 20 minutes since stor trip	c. Continue with Step 2 either condition met Steps 20d and e.	
d. Verify ENERGI	source range detector: MED	d. Manually energize so detectors by depress permissive defeat pu of 2). <u>IF</u> source ranges can restored. <u>THEN</u> refer r.R-NIS.1, SR MALFUNC to Step 21.	sing P-6 ushbuttons (2 n <u>NOT</u> be to
source	er Rk-45 recorder to one range and one ediate range channel		

ECA-0.1

TITLE:

LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

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STE		CTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED
21	Margin	Adequate Shutdown : ect RP to sample RCS and PRZM aid for boron concentration	R	
	b. Ver: GREA	fy boron concentration - TER THAN REQUIREMENTS OF 2.0. FIGURE SDM		b. Borate as necessary.
22	Mainta Condit	in Stable Plant ions		
	a. RCS	pressure – STABLE		a. Control PRZR heaters and auxiliary spray if available.
	b. RCS	temperature – STABLE		b. Control dumping steam as necessary.
		R level - BETWEEN 20% [40% erse CNMT] and 50%		c. Control charging as necessary.
		act S/G level – BETWEEN 17% adverse CNMT] and 52%		d. Control S/G feed flow as necessary.
*23	Monito Criter	r SI Initiation ia:		
	exi USII	subcooling based on core T/Cs ~ GREATER THAN 0°F G FIG-1.0. FIGURE MIN COOLING		A. Go to ECA-0.2. LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRE Step 1.
		level – GREATER THAN 10% adverse CNMT]		b. Control charging flow to maintain PRZR level.
				<u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> go to ECA-0.2 LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.

EOP:			
ECA-0.1	LOSS OF ALL AC POWER R	ECOVERY WITHOUT SI UIRED	REV: 24
			PAGE 21 of 2
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
TO AL ER-ELI	o Restore Offsite Power 1 AC Busses (Refer to EC.1, RESTORATION OF IE POWER)	Maintain plant conditi using AC emergency pow	
25 Impler Proced	ment Plant Recovery dures:		
rea (Re	iew plant systems for lignment to normal conditions fer to ATT-26.0. ATTACHMENT URN TO NORMAL OPERATIONS)		
	sult plant staff to determine RCS cooldown is necessary	b. <u>IF</u> cooldown <u>NOT</u> req go to O-3, HOT SHUT XENON PRESENT.	
c. At	least one RCF · OPERABLE	c. Go to ES-0.2, NATUR CIRCULATION COOLDOW	
	to 0-2.2. FLANT SHUTDOWN FROM SHUTDOWN TO COLD SHUTDOWN		
	- El	nib	

ECA-0	1	

EOP:

TITLE:

LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

PAGE 1 of 1

ECA-0.1 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE SDM (FIG-2.0)
- 3) ATTACHMENT SD-1 (ATT-17.0)
- 4) ATTACHMENT SD-2 (ATT-17.1)
- 5) ATTACHMENT N2 PORVS (ATT-12.0)
- 6) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 7) ATTACHMENT RETURN TO NORMAL OPERATIONS (ATT-26.0)
- 8) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)

9) FOLDOUT

EOP:		REV: 24
	LOSS OF ALL AC POWER RECOVERY WITHOUT SI	REV. 24
ECA-0.1	REQUIRED	PAGE 1 of

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.

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b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ECA-0.2		REV: 16
	LOSS OF ALL AC POWER RECOVERY WITH SI	REV: 16
	REQUIRED	PAGE 1 O
		PAGE 1

GINNA STATION ______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

- [[EOP:	TITLE:									D.D.V.	1 0		
	ECA-0.2		LOSS	OF	ALL	AC		RECOVERY	WITH	SI	REV:	Τ0		
ļ		1					REQ	JIRED			PAGE	2 0	of	9

A. PURPOSE - This procedure provides actions to use engineered safeguards systems to recover plant conditions following restoration of AC emergency power.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is required.

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b. ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, if SI is required.

ļ	EOP: ITITLE:	
	ECA-0.2 LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED	REV: 16
		PAGE 3 of 9
	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED NOTE: • CSFSTs should be monitored for information only. FR proc should not be implemented prior to completion of Step 10. • Adverse CNMT values should be used whenever CNMT pressure greater than 4 prig or CNMT radiation is greater than 10 ⁺ • FOLDOUT page chould be open and monitored periodically. 1 Reset SI 2 Check RCP CCW Isolation Status: a. CGW pumps - BOTH PUMPS OFF a. CGW return valves - CLOSED b. RCP CCW return valves - CLOSED b. MOV-759A • MOV-759B • ROV-754B • OR- • RCP CCW supply va	is 05 R/hr. S as arrier
\bigcirc		. ·

ECA-0.2	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3 Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
<u>NOTE</u> : SI actuation to establish safeguards recommended.	s valve alignment is not
4 Manually Align SI And RHR Pumps To Establish SI Injection:	
a. SI pump suction valves from RWST - OPEN	a. Ensure at least one SI pump suction valve from RWST open.
 MOV-825A MOV-825B 	• MOV-825A • MOV-825B
b. Verify SI pump C discharge valves - OPEN	b. Manually open valves as necessary.
• MOV-871A • MOV-871B	
c. RHR pump discharge to Rx vessel deluge - OPEN	c. Ensure at least one deluge valve open.
 MOV-852A MOV-852B 	• MOV-852A • MOV-852B

ECA-0.2	TITLE: LOSS OF ALL AC POWE RE	R RECOVERY WITH SI CQUIRED PAGE 5 of	9
· · · · · · ·	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	*
CAPACITY O 5 Manual Safegu	F THE POWER SOURCE.		•
a. Star	t all SI pumps	 a. Perform the following: Start available SI pumps. 2) <u>IF</u> SI pump A or B <u>NOT</u> available. <u>THEN</u> verify SI pump C aligned as follows: <u>IF</u> SI pump A <u>NOT</u> available. <u>THEN</u> ensure MOV-871B closed. 6) <u>IF</u> SI pump B <u>NOT</u> available. <u>THEN</u> ensure MOV-871A closed. 	
o P 2 C o P 1 c. Plac	k RCS pressure ressure GFEATEE THAN 50 psig (web psig adverse NMT) Pressure STABLE OF NCREASING e RHR pump switches in AUTO t all available CNMT RECIPC	h Manually start both RHR pumps and go to Step 5d.	

ECA-0.2	AC POWER RECOVERY WITH SI REQUIRED	PAGE 6 of
STEP ACTION/EXPECTED RESPO	NSE RESPONSE NOT OBTAI	(NED
* * * * * * * * * * * * * * * *	CAUTION	* * * * * * * *
	LESS THAN 5 FEET, THEN ALTERNATE SSARY (REFER TO ER-AFW.1, ALTERNA	
	CO LESS THAN 7% [25% ADVERSE CNMT THE MDAFW PUMPS SHOULD BE MANUAL CER TO THE S/G(S).	-
• • • • • • • • • • • • • • • •		* * * * * * * *
	ion is not required, pump switche OP to prevent automatic start.	s should be
o TDAFW pump flow cont	ol AOVs may drift open on loss o	f IA.
* 6 Monitor Intact S/G Lev	els:	
a. Harrow range level - GR THAN /% [25% adverge CN		il narrow range an 7% [25%
	<u>lF</u> feed flow les <u>THEN</u> perform the	
	 Verify MDAFW valve to inta 	pump discharge ct S/G(s) open.
	 S/G A. MOV- S/G B. MOV- 	
	2) Manually star necessary (22	
b. Control feed flow to ma narrow range level betw [25% adverse CNMT; and	eers 1 **	

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EOP:	LOSS OF ALL AC POW	VER RECOVERY WITH SI	REV: 16
ECA-0.2	R	EQUIRED	PAGE 7 of 9
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
a. CI a • Ar IS • Ar VE	CI And CVI: and CVI annunciators - LIT munciator A-26, CNMT SOLATION munciator A-25, CONTAINMENT INTILATION ISOLATION	• • •	
	fy CI and CVI valve status ts – BRIGHT	b. Manually close CI an valves. <u>IF</u> valves c verified closed by M indication, <u>THEN</u> dis locally close valves ATT-3.0, ATTACHMENT	an <u>NOT</u> be ICB spatch AO to s (Refer to
	RECIRC fan coolers SW et valve status lights - HT	c. Dispatch AO to local valves.	ly fail open

• AOV-4561

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• AOV-4562

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ł	ECA-0.2

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TITLE:

LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED

REV: 16

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Verify CNMT Spray Not	<u>IF</u> CNMT pressure is less than 28
Required:	psig, <u>THEN</u> perform the following:
 Annunciator A-27, CNMT SPRAY - EXTINGUISHED 	a. Reset CNMT spray.
o CNMT pressure - LESS THAN 28 PSIG	b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor.
	<u>IF NOT. THEN</u> perform the following:
	a. Depress manual CNMT spray pushbuttons (2 of 2).
	b. Ensure CNMT spray pump discharge valves open.
	o CNMT spray pump A:
	MOV-860AMOV-860B
	o CNMT spray pump B:
	MOV-860CMOV-860D
	c. Verify NaOH tank flow (FI-930).
	<u>IF</u> NaOH flow <u>NOT</u> indicated, <u>THE</u> place switches for NaOH tank outlet valves to OPEN.
	AOV-836AAOV-836B
	d. Start both CNMT spray pumps
	e. Go to step 10.

ECA-0.2	
RE(QUIRED PAGE 9
[] [
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Place CNMT Spray Pumps In AUTO	
10 Check RCP Seal Injection Needle Valves - CLOSED	Locally close valves before
• V-300A • V-300B	starting charging pump.
<u>NOTE</u> : FR procedures may now be implemen	ted as necessary.
11 Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1	~
-	END -

EOP:	TINE:	REV: 16
ECA-0.2	LOSS OF ALL AC POWER RECOVERY WITH SI	$\begin{bmatrix} \mathbf{R} \mathbf{L} \mathbf{V} \cdot \mathbf{I} \mathbf{U} \end{bmatrix}$
ECA-0.2	REQUIRED	PAGE 1 of

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ECA-0.2 APPENDIX LIST

TITLE

1) ATTACHMENT CI/CVI (ATT-3.0)

2) ATTACHMENT NO SW PUMPS (ATT-2.4)

3) FOLDOUT

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EOP:	LOSS OF ALL AC POWER RECOVERY WITH SI	REV: 16
ECA-0.2	REQUIRED	PAGE 1 of 1

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. ł.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	TIRE:	REV:	23	
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	PAGE	1 of	2
		PAGE		

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE JANAGER

<u>11-17-2004</u> EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	TINE:	REV:	23	
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	PAGE	2 of	34

- A. PURPOSE This procedure provides actions to restore emergency coolant recirculation capability, to delay depletion of the RWST by adding makeup and reducing outflow, and to depressurize the RCS to minimize break flow.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when cold leg recirculation capability cannot be verified.
 - b. ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, when recirculation cannot be established or maintained <u>OR</u> when RWST level is < 15% and recirculation has not been established.
 - c. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment cannot be isolated.

•	EOP: TITE: ECA-1.1 LOSS OF EMERGENCY COOLANT RECIRCULATION	REV: 23				
	ECA-1.1 LOSS OF EMERGENCI COOLANI RECIRCOLATION	PAGE 3 of 34				
)						
	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED					
	<u>CAUTION</u>	* * * * * * *				
	 IF EMERGENCY COOLANT RECIRCULATION IS ESTABLISHED DURING THIS P FURTHER RECOVERY ACTIONS SHOULD CONTINUE BY RETURNING TO ES-1.3 TO COLD LEG RECIRCULATION. 					
	• IF SUCTION SOURCE IS LOST TO ANY SI OR CNMT SPRAY PUMP. THE PUMP SHOULD BE STOPPED.					
		* * * * * * *				
	<u>NOTE</u> : o Adverse CNMT values should be used whenever CNMT pressure greater than 4 psig or CNMT radiation is greater than 10 ⁺	is 05 R/hr.				
	o FOLDOUT page should be open and monitored periodically.					
	* 1 Verify CNMT Sump Recirculation Capability:					
Ĵ	a. Check CNMT Sump B level - AT a. <u>IF</u> Sump B level less LEAST 113 INCHES 113 inches due to a inventory outside CN to Step 2.	loss of RCS				
i						
)	This Step continued on the next page.	·				

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LOSS OF EMERGENCY COOLANT RECIRCULATION

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(Step 1 cont	inued from previous page	2)	
b. Check RHR	cystem:	b. Pe	erform the following:
 RHR suc B - OPE MOV-8 MOV-8 MOV-8 RHR pum vessel OPERABL MOV-8 MOV-8 MOV-8 OCCW pum 	50A 50B discharge to Rx deluge valves - 52A 52B 555 - OPERABLE RHR Hx - OPERABLE 38A		Manually or locally try to restore at least one flowpat (Refer to ATT-14.5. ATTACHMENT RHR SYSTEM to identify minimum components for one flowpath). Continue with step 2. <u>WHEN</u> at least one flowpath is restored. <u>THEN</u> do steps 1c. and e.
	east two SW pumps -		nually start SW pumps as powe pply permits (257 kw each).
d. Check RWST 28%	level - GREATER THAN	LE co pr Em	to ES-1.3. TRANSFER TO COLD G RECIRCULATION. Step 2 <u>AND</u> ntinue with step 2 of this ocedure until such time as ergency Coolant Recirculation established.
e. Return to peffect.	procedure and step in		- -

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2 Verify CNMT RECIRC Fans Running:	
a. All fans – RUNNING	a. Manually start fans.
 b. Charcoal filter dampers green status lights - EXTINGUISHED 	b. Dispatch personnel with relay rack key to locally open dampers using trip relay pushbuttons in relay room racks.
	 AUX RELAY RACK RA-2 for fan A AUX RELAY RACK RA-3 for fan C
3 Monitor RWST Level - GREATER THAN 15%	Go to Step 27.

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Deter Requi	mine CNN rements:	AT Spray			
		umber of CNMT spray red from table:			
	RWST LEVEL	CNMT PRESSURE	CNMT RECIRC FANS RUNNING	CNMT SPRAY PUMPS REQUIRED	
		GREATER THAN 60 PSIG	-	2	
	GREATER	GREATER THAN BETWEEN 28% 28 PSIG AND 60 PSIG	0 OR 1	2	
			2 OR 3	1	
			ALL	0	
		LESS THAN 28 PSIG	-	0	
	BETWEEN	GREATER THAN 60 PSIG	-	2	
	15% AND	BETWEEN	0.1.2.OR 3	1	
	28%	28 PSIG AND 60 PSIG	ALL	0	
		LESS THAN 28 PSIG	-	0	
	LESS THAN 15%	-	-	0	
L			l	<u></u>	

This Step continued on the next page.

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	PAGE 7 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 4 continued from previous page))
b. CNMT spray pumps running - EQUAL TO MINIMUM NUMBER REQUIRED	b. Manually operate CNMT spray pumps as necessary.
	<u>IF</u> CNMT spray pump(s) must be stopped, <u>THEN</u> perform the following:
	1) Reset CNMT spray.
	 Place CNMT spray pump in PULL STOP.
	 <u>IF</u> CNMT pressure less than 28 psig. <u>THEN</u> close discharge valves for idle CNMT spray pump(s).
	o Pump A
	MOV-860AMOV-860B
	o Pump B
	• MOV-860C • MOV-860D
· · · ·	
	· ·

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	<u> </u>		<u></u>	<u> </u>
STEP A	CTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED]
		L	<u></u>	-
5 Add Ma Necess	keup To RWST As ary			
SFP	er to ATT-18.0, ATTACHMENT RWST (~ 400 gpm can be ected)			
	- OR -			
WATH OR S	er to S-3.2D. TRANSFERRING ER FROM CVCS HUT(S) TO RWST SFP (~ 60 gpm can be ected)			
	- OR -			
	er to S-9J. BLENDING TO RWST 00 gpm can be expected)			
• • • • • •	<u>CAU</u>	<u></u>	* * * * * * * * * * *	* * * * * * *
	VEL DECREASES TO LESS THAN 5 WILL BE NECESSARY (REFER TO			
	· · · · · · · · · · · · · · · ·	• • • •	•••••	
<u>NOTE</u> : TDAI	W pump flow control A0Vs ma	y drift	open on loss of IA.	
* 6 Monito	r Intar: S/G Levels:			
	ow range level GREATEF 1 7% [25% adverse CHMT]	4	Maintain total feed than 200 gpm until a level greater than a adverse CNMT] in at S/G.	narrow range 7% [25%
nari	rol feed flow to maintain ow range level between 17% adverse CNMT1 and 50%	b	. <u>IF</u> narrow range leve continues to increas feed flow to that S	se. <u>THEN</u> stop

ECA-1.1 LOSS OF EMERGENCY COO	PAGE 9 (
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : Shutdown margin should be monitor FIG-2.0, FIGURE SDM).	ed during RCS cooldown (Refer to
7 Initiate RCS Cooldown To Cold Shutdown:	· .
a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
b. Dump steam to condenser from intact S/G(s)	<pre>b. Manually or locally dump steam from intact S/G(s):</pre>
	o Use S/G ARVs
	-OR-
	o Open TDAFW pump steam suppl valves.
	- OR -
	o Dispatch AO to perform the following:
	 Open S/G MSIV bypass valves.
	 Open priming air ejector steam supply root valve, V-3578.
	3) Open 1A and 1B priming a ejector icolation valved
	 V-3580 V-3581
	<u>lF</u> no intact S/G available. <u>TH</u> use faulted S/G.

EOP: TITLE: ECA-1.1 LOSS OF EMERGENCY COOL	REV: 23
ECA-1.1 LOSS OF EMERGENCI COOL	PAGE 10 of 34
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
·	
8 Check ECCS Pump Status:	Go to step 19.
o SI Pumps - ANY RUNNING	
- OR -	
 RHR Pumps - ANY RUNNING IN INJECTION MODE 	
CAUTIO	<u>N</u>
IF OFFSITE POWER IS LOST AFTER SI RESET, TO RESTART SAFEGUARDS EQUIPMENT. (REFER OFFSITE POWER)	
9 Reset SI If Necessary	
10 Establish One Train Of SI Flow	
a. SI pumps – LESS THAN THREE RUNNING	a. Stop one SI pump.
b. RCS pressure – LESS THAN 250 psig [465 psig adverse CNMT]	b. Stop RHR pumps and go to Step 11.
c. RHR pump - ONLY ONE RUNNING	c. <u>IF</u> two RHR pumps running, <u>THEN</u> stop one RHR pump.
	<u>IF</u> no RHR pumps running, <u>THEN</u> start one RHR pump.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11 Verify No Backflow From RWST To Sump:	
 a. Any RHR suction valve from sump B - OPEN MOV-850A MOV-850B 	a. <u>IF</u> both RHR suction valves from sump B closed, <u>THEN</u> go to Step 12.
b. RWST outlet valve to RHR pump suction (MOV-856) - CLOSED	b. Perform the following:1) Place MOV-856 key switch to ON
	2) Manually close valve
	<u>IF</u> valve can <u>NOT</u> be closed manually. <u>THEN</u> direct AO to locally close valve.
12 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26, CNMT	b. Perform the following:
ISOLATION - EXTINGUISHED	1) Reset SI.
	2) Depress CI reset pushbutton.

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STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Verify	Adequate SW Flow:	
a. Checl RUNN	c at least two SW pumps – ING	a. Manually start SW pumps as power supply permits (257 kw each).
		<u>IF</u> less than two SW pumps running. <u>THEN</u> perform the following:
		1) Ensure SW isolation.
		2) <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
		a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
		b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
		3) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
shute	atch AO to establish normal down alignment (Refer to 17.0, ATTACHMENT SD-1)	

OP: ECA-1.1 LOSS OF EMERGENCY COOL	ANT RECIRCULATION REV: 23 PAGE 13 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14 Establish IA to CNMT: a. Verify non-safeguards busses	a. Perform the following:
energized from offsite power o Bus 13 normal feed – CLOSED	1) Close non-safeguards bus tie breakers:
-OR- o Bus 15 normal feed - CLOSED	 Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).
	IF NOT. THEN perform the following: o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
	-OR- o Evaluate if CNMT RECIRC fanc should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
	3) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting.
b. Check SW pumper AT LEAST TWO PUMPS RUNNING	 Perform the following: 1) Rectore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
	2) Go to Step 14d.
This Step continued on the next page	· ·

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 c. Verify SW isolation values to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressor(s) - RUNNING 	 c. Perform the following: Manually align valves. Dispatch AO to locally reset compressors as necessary. d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressor can NOT be started. THEN start diesel air compressor (Refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR).
e. Check IA supply: o Pressure GREATER THAN 60 PSIG o Pressure STABLE OF INCREASING	 e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS O INSTRUMENT AIR). 2) Continue with Step 15. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 14f and g.
<pre>f. Remet both trainm of XY relaym for IA to CNMT A0% 5397 g. Verify IA t CNMT A0% 5492 OPEN</pre>	

STEP ACTION/EXPECTED RESPONSE	LANT RECIRCULATION PAGE 15 of 3
STEP ACTION/EXPECTED RESPONSE	
STEP ACTION/EXPECTED RESPONSE	
	RESPONSE NOT OBTAINED
15 Establish Required Charging Line Flow:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally close seal injection needle valves to affected RCP:
	 RCP A, V-300A RCP B, V-300B
	2) Ensure HCV-142 demand at 0%.
	3) Start one charging pump.
b. Establish 20 gpm total charging flow	

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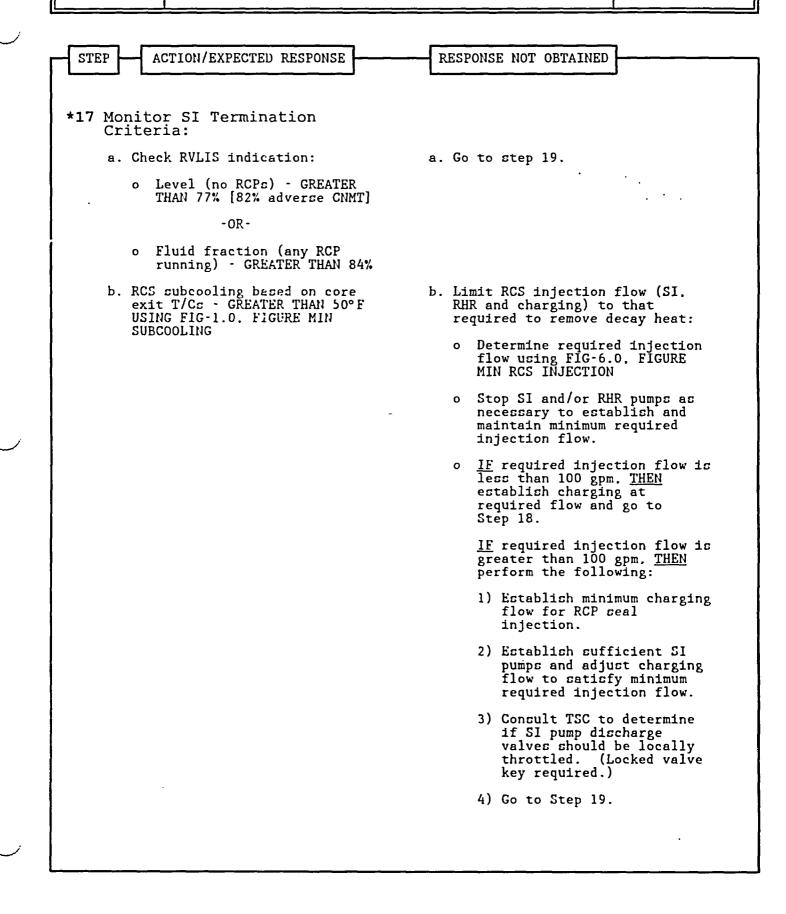
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
STEP ACTION/EXPECTED RESPONSE	KESPONSE NOT OBTAINED
<u>CAUTION</u>	* * * * * * * * * * * * * * * * * * *
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN L NOT BE STARTED PRIOR TO A STATUS EVALUATI	
	* * * * * * * * * * * * * * * * * * * *
16 Check If An RCP Should Be Started:	<u>-</u>
a. All RCPs - STOPPED	a. Stop all but one RCP and go to step 17.
b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Go to Step 17.
c. Try to start an RCP:	
1) Establish conditions for starting an RCP	
o Bus llA or llB energized	
o Refer to ATT-15.0. ATTACHMENT RCP START	
2) Start one RCP.	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Stop SI And RHR Pumps And Place In Auto	
<pre>*19 Verify Adequate RCS Makeup Flow:</pre>	
a. Check RVLIS indication:	a. Increase RCS injection flow as
o Level (no RCPs) – GREATER THAN 77% [82% adverse CNMT]	necessary to maintain RVLIS indication stable.
- OR -	
o Fluid fraction (any RCP running) - GREATER THAN 84%	
b. Core exit T/Cc - STABLE OR DECREASING	b. Increase RCS injection flow to maintain core exit T/Cs stable or decreasing.
	· .

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LOSS OF EMERGENCY COOLANT RECIRCULATION

20 Check If Emergency D/Gs Should Be Stopped: a. Verify AC emergency busses energized by offsite power:	a. Perform the following:
 Emergency D/G output breakers - OPEN AC emergency bus voltage - GREATER THAN 420 VOLTS AC emergency bus normal feed breakers - CLOSED 	 Close non-safeguards bus tie breakers as necessary: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie Place the following pumps in PULL STOP: EH pumps Turning gear oil pump HP seal oil backup pump Ensure condenser steam dump mode control in MANUAL. Restore power to MCCs: A from Bus 13 B from Bus 15 F from Bus 15 F from Bus 15 Start HP seal oil backup pump Ensure D/G load within limits WHEN bus 15 restored. THEN reset control room lighting breaker. Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power.
	9) Try to restore offsite power. (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER)
b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

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LOSS OF EMERGENCY COOLANT RECIRCULATION

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * *	<u>CAUTIO</u>	<u>N</u>
THE UPP RUNNING		S DEPRESSURIZATION IF RCPS ARE NOT INCREASING PRZR LEVEL.
<u>NOTE</u> :]	If normal RCP support conditions conditions controls and the stopped.	an NOT be satisfied, then any
	ressurize RCS To Decrease Subcooling:	
c]	Check RCS subcooling based on core exit T/Cs - GREATER THAN LO°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Go to Step 22.
ь. 1	Jormal PRZR spray AVAILABLE	b. Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available. <u>THEN</u> refer to ATT-12.0. ATTACHMENT N2 PORVS.
		<u>IF</u> no PRZR PORV available. <u>THEN</u> use auxiliary spray valve (AOV-296).
1	Depressurize RCS until either of the following conditions satisfied:	
c	 RCS subcooling based on core exit T/Cs LESS THAN 10°F USING FIG 1.0. FIGURE MIN SUBCOOLING 	
	UF	
C	PRZR level GREATEF THAN 5% [05% adverge CNMT]	
d. <u>v</u>	<u>MEN</u> either condition met. <u>THEN</u> ctop RCS depressurization	
•]	Check RCS subcooling GREATEE THAN O°F USING FIGALAC, FIGURE 41N SUBCOOLING	e. Increase RCS makeup flow as necessary to restore subcooling.

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2 Check If RHR Normal Cooling	
Can Be Established:	
a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 23.
b. RCS pressure – LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 23.
c. Place letdown pressure controller (PCV-135) in MANUAL CLOSED	
d. Check following valves - OPEN	d. Perform the following:
 AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx 	 Reset both trains of XY relays for AOV-371 and AOV-427.
 At least one letdown orifice 	2) Open AOV-371.
valve (AOV-200A. AOV-200B. or AOV-202)	3) Place AOV-427 switch to OPEN.
	4) Open one letdown orifice valve.
e. Verify pressure on Pl-135 - LESS THAN 400 PSIG	e. Go to Step 23.
f. Place RCS overpressure protection system in service (Refer to 0.7. ALIGNMENT AND) OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	
g. Consult TSC to determine if RHE normal cooling should be ostablished using ATT-14.1. ATTACHMENT RHR COOL	
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ECA-1.1 LOSS OF EMERGENCY COOL	ANT RECIRCULATION
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23 Check If SI ACCUMs Should Be Isolated:	
a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 24. <u>WHEN</u> both RCS hot leg temperatures less than 400°F. <u>THEN</u> do Steps 23b, c and d.
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
MOV-841MOV-865	 Open vent valves for unicolated SI ACCUMs.
	 ACCUM A, AOV-834A ACCUM B, AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC for contingency actions.

d. Locally reopen breakers for MOV-841 and MOV-865

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*24 Monitor RCP Operation:	
a. RCPs - ANY RUNNING	a. Go to Step 25.
b. Check the following:	b. Stop affected RCP(s).
o RCP #1 seal D/P - GREATER THAN 220 PSID	
o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0. FIGURE RCP SEAL LEAKOFF	
25 Check Core Exit T/Cs - GREATER THAN 200°f	Go to Step 40.
26 Check RWST Level - LESS THAN 15%	Return to Step 1.
	·

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27 Minimize RWST Outflow:	
a. Any SI pump(s) - RUNNING	a. <u>IF</u> charging pump suction aligned to RWST, <u>THEN</u> perform the following:
	 Verify SI pump suction aligned to RWST, MOV-825A or MOV-825B open.
	 Start one SI pump and verify flow.
	3) Stop running charging pumps.
	4) Go to Step 27d.
b. Stop all but one SI pump	
c. Check charging pump suction from RWST (AOV-112B) - CLOSED	c. Stop all charging pumps
d. Stop both RHR pumps	
e. Pull Stop both CNMT spray pumps	
f. Check CNMT pressure - LESS THAN 28 PSIG	f. Go to Step 28.
g. Reset CNMT spray	
h. Close discharge valves for idle CNMT spray pump	
o Pump A	· .
 MOV-860A MOV-860B 	
o Pump'B	
 MOV-860C MOV-860D 	
i. Determine required injection flow using FIG-6.0. FIGURE MIN RCS INJECTION	
j. Consult TSC to determine if SI pump discharge valve should be locally throttled (locked valve key required)	

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ECA-1.1 LOSS OF EMERGENCY COOD	LANT RECIRCULATION PAGE 25 c
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*28 Check SI pump flow - STABLE	<u>IF</u> SI flow zero or erratic. <u>THEN</u> stop running SI pump.
29 Try To Add Makeup To RCS From VCT:	· · ·
a. Check VCT level – GREATER THAN 5%	a. Stop charging pumps taking suction from VCT and continue with Step 30. <u>WHEN</u> VCT level greater than 5%. <u>THEN</u> do Steps 29b and c.
b. Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
o LCV-112C - OPEN	
o LCV-112B CLOSED	
c. Establish two charging pumps running	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30 Establish Maximum VCT Makeup: a. Check RMW control armed - RED LIGHT LIT b. Check VCT level - LESS THAN 20%	 a. Place RMW mode switch in AUTO and place RMW control switch to START. b. Continue with Step 31. <u>WHEN</u> VCT
c. Check VCT makeup system - OPERATING IN AUTO	<pre>level less than 20%. <u>THEN</u> do Steps 30c. d and e. c. Perform the following: 1) Open makeup system valves.</pre>
 d. Increase VCT makeup flow Start both EMW pumps Start both boric acid pumps Adjust RMW controller (HC-111) to maximum flow from table 	3) Open boric acid flow control valve (AOV-110A).
 4) Adjust boris acid flow controller (HC 110A) in MANUAL to 9.5 gpm e. Adjust charging pump speed to stabilize VCT level 	

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	PAGE 27 of :
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31 Add Makeup To RWST As Necessary	
o Refer to ATT-18.0, ATTACHMENT SFP-RWST (~ 400 gpm can be expected)	
-OR-	
o Refer to S-3.2D. TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP (~ 60 gpm can be expected)	
- OR -	
o Refer to S-9J. BLENDING TO RWST (~ 50 gpm can be expected)	
32 Try To Add Makeup To RCS From Alternate Source:	
a. Evaluate Use Of RCDT Pumps (Refer to ER-RHR.1, RCDT PUMP OPERATION FOR CORE COOLING)	
b. Consult TSC to determine other means of makeup	
33 Verify SI ACCUM Isolation Valves - OPEN	<u>lF</u> valves were closed to prevent SI ACCUM nitrogen injection. <u>THEN</u> go to Step 37.
 MOV-841 MOV-865 	<u>IF NOT. THEN</u> perform the following:
	a. Dispatch AO to locally close breakers for SI ACCUM discharge valves
	 MOV-841. MCC C position 12F MOV-865. MCC D position 12C
	b. Open SI ACCUM discharge valves.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34 Depressurize All Intact S/Gs To 785 PSIG:	
a. Check S/G pressures - GREATER THAN 785 PSIG	a. Go to Step 35.
b. Dump steam to condenser at maximum rate	<pre>b. Manually or locally dump steam at maximum rate from intact S/G(s):</pre>
	o Use S/G ARVs
	- OR -
	o Open steam supply valves to TDAFW pump
	- OR -
	<pre>o Dispatch AO to perform the following:</pre>
	 Open S/G MSIV bypass valves.
	2) Open priming air ejector steam isolation valves
	V-3580V-3581
c. Check S/G pressures - LESS THAN /85 PS1G	c. Return to Step 34b.

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ECA-1.1 LOSS OF EMERGENCY COOLA	ANT RECIRCULATION	REV: 23
		PAGE 29 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
		5
<u>NOTE</u> : The intent of the next step is to d at a rate that will maintain requir		owly, but
35 Depressurize Intact S/Gs To 200 PSIG Slowly To Inject SI		
ACCUMs:		· · .
a. Dump steam to condenser as necessary to maintain appropriate RVLIS indication:	a. Manually or locally from intact S/G(s) t appropriate RVLIS in	o maintain
o Level (no RCPs) - BETWEEN 77% AND 82% [82% AND 85% adverse	o Use S/G ARVs	
CNMT]	-OR-	
-OR-	o Open steam supply TDAFW pump	valves to
o Fluid fraction (any RCP running) BETWEEN 84% AND 90%	- OR -	
	o Dispatch AO to pe following:	erform the
	 Open affected bypass valve. 	S/G MSIV
	2) Open priming a steam isolatio	
	V-3580V-3581	
b. Check S/G pressures · LESS THAN 200 PSIG	-	
c. Stop S/G depressurization		

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	ECA-1.1

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LOSS OF EMERGENCY COOLANT RECIRCULATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36 Check If SI ACCUMs Should Be Isolated:	
a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 37. <u>WHEN</u> both RCS hot leg temperatures less than 400°F, <u>THEN</u> do Steps 36b, c and d.
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
MOV-841MOV-865	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC for contingency actions.
d. Locally reopen breakers for MOV-841 and MOV-865	•

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ECA-1.1 LOSS OF EMERGENCY COOL	
<u> </u>	PAGE 31 of
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*37 Monitor RCP Operation:	
a. RCPs - ANY RUNNING	a. Go to Step 38.
b. Check the following:	b. Stop affected RCP(c).
o RCP #1 seal D/P - GREATER THAN 220 PSID	
o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	
38 Depressurize All Intact S/Gs To Atmospheric Pressure:	
a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
b. Dump steam to condenser	b. Manually or locally dump steam from intact S/G(s):
	o Use S/G ARVs
	-OR-
	o Open steam supply valves to TDAFW pump
	-OR-
	 Dispatch AO to perform the following:
	 Open S/G MSIV bypass valves.
	2) Open priming air ejector cteam isolation valves
	V-3580V-3581

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 B Check If RHR Normal Cooling Can Be Established: a. RCS cold leg temperature - LESS THAN 350°F b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] 	a. Return to Step 38. b. Return to Step 38.
c. Place letdown pressure controller in MANUAL CLOSED	
d. Check following valves - OPEN	d. Perform the following:
 AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx 	 Reset both trains of XY relays for AOV-371 and AOV-427.
 At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve.
e. Verify pressure on PI-135 - LESS THAN 400 PS16	e. Return to Step 38.
f. Place RCC overpressure protection system in service (Refer to 0 %, ALIGNMENT AND OPERATION OF THE REACTOP VESSEL OVERPRESSURE FROTECTION SYSTEM	
g. Consult TSC to determine if FHF normal cooling should be established using ATT-14.1. ATTACHMENT RHF COOL	

EOP: TITE: ECA-1.1 LOSS OF EMERGENCY COC	
	PAGE 33 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40 Maintain RCS Heat Removal:	
a. Use RHR system if in service	
b. Dump steam to condenser from intact S/Gs	b. Manually or locally dump steam from intact S/G(s):
	o Use S/G ARVs
	- OR -
	o Open steam supply valves to TDAFW pump
	- OR -
	o Dispatch AO to perform the following:
	 Open S/G MSIV bypass valves.
	2) Open priming air ejector steam isolation valves
	 V-3580 V-3581
	<u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service. <u>THEN</u> use faulted S/G.

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ECA-1.1 LOSS OF EMERGENCY COOLA	NT RECIRCULATION PAGE 34 c	of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
<u>NOTE</u> : This procedure should be continued sample in the next step.	while obtaining CNMT hydrogen	
41 Check CNMT Hydrogen Concentration:		
a. Direct RP to start CNMT hydrogen monitors as necessary		
b. Hydrogen concentration - LESS THAN 0.5%	b. Consult TSC to determine if hydrogen recombiners should be placed in service.	
42 Consult TSC		
- E1	D -	

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EOP: ECA-1.1

ECA-1.1 APPENDIX LIST

TITLE

TITLE:

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE SDM (FIG-2.0)
- 3) FIGURE MIN RCS INJECTION (FIG-6.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT SFP-RWST (ATT-18.0)
- 7) ATTACHMENT RCP START (ATT-15.0)
- 8) ATTACHMENT SD-1 (ATT-17.0)
- 9) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 10) ATTACHMENT RHR SYSTEM (ATT-14.5)
- 11) ATTACHMENT N2 PORVS (ATT 12.0)
- 12) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 14) ATTACHMENT SI/UV (ATT P 4)
- 15) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 16) FOLDOUT

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EOP:

LOSS OF EMERGENCY COOLANT RECIRCULATION

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

1	EOP:	TINC:	
	ECA-2.1	UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM	REV: 28
∦	ECA-2.1	GENERATORS	PAGE 1 of 36

GINNA STATION CONTROLLED COPY NUMBER 23

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SPONSIBLE MANAGER RE

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0 .

REVIEWED BY:

EOP:		
ECA-2.1	UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM	REV: 28
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- A. PURPOSE This procedure provides actions to mitigate and minimize a loss of secondary coolant from both steam generators.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-2, FAULTED STEAM GENERATOR ISOLATION, when an uncontrolled depressurization of both steam generators occurs.

ECA-2.1

TITLE:

UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
		* * * * * * * * * * * * * * * * * * * *
	CAUTION	
IF TH	E TDAFW PUMP IS THE ONLY AVAILABLE SO	URCE OF FEED FLOW. THEN STEAM
SUPPL	Y TO THE TDAFW PUMP MUST BE MAINTAINE.	D FROM ONE S/G.
	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *
<u>NOTE</u> :	o FOLDOUT page should be open AND m	conitored periodically.
	o Conditions should be evaluated fo (Refer to EPIP 1-0, GINNA STATION CLASSIFICATION).	
	o Adverse CNMT values should be use greater than 4 psig or CNMT radia	
	eck Secondary Pressure oundary:	Manually close valves one loop at a time.
o	MSIVE - CLOSED	<u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally isolate
o	MFW flow control valves - CLOSED	flowpaths, as necessary, one loop at a time.
	 MFW regulating values MFW bypass values 	
o	MFW pump diccharge valvec - CLOSED	
o	S/G blowdown and sample valves - CLOSED	
o	TDAFW pump steam supply valves – PULL STOP	
o	TDAFW pump flow control valves - CLOSED	
o	S/G ARVE - CLOSED	
o	Dispatch AO to locally isolate S/Gs (Refer to ATT-10.0. ATTACHMENT FAULTED S/G)	
		·

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	ECA-2.1	
•		PAGE 4 of 36
	STEP ACTION/EXPECTED RESPONSE RES	SPONSE NOT OBTAINED
		* * * * * * * * * * * * * * * * *
	CAUTION	
	A MINIMUM FEED FLOW OF 50 GPM MUST BE MAINTAINE RANGE LEVEL LESS THAN 7% [25% ADVERSE CNMT].	D TO EACH S/G WITH A NARROW
l	• • • • • • • • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * *
	<u>NOTE</u> : Shutdown margin should be monitored durin FIG-2.0, FIGURE SDM).	g RCS cooldown (Refer to
	2 Control Feed Flow To Minimize RCS Cooldown:	
i		ecrease feed flow to 50 gpm to each S/G and go to Step 2c.
÷	S/Ge - LESS THAN 50% n	Control feed flow to maintain arrow range level less than 50% n both S/Gs.
		control feed flow or dump steam to stabilize RCS hot leg temperatures.
	* 3 Monitor RCP Trip Criteria:	
	a. RCP status · ANY RCP RUNNING a. G	o to Step 4.
	b. SI pumps - AT LEAST TWO RUNNING b. G	to Step 4.
	c. RCS pressure minus maximum S/G c. G pressure - LESS THAN 1/5 psig [400 psig adverse CNMT]	o to Step 4.
	d. Stop both RCPs	

EOP: TITLE: ECA-2,1 UNCONTROLLED DEPRESSURIZA	
GENER	PAGE 5 of 36
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTION</u>	<u>1</u>
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PF AFTER PRESSURE DECREASES TO LESS THAN 233	
* 4 Monitor PRZR PORVs And Block Valves:	
a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV:
	 MOV-515, MCC D position 6C MOV-516, MCC C position 6C
b. PORVs - CLOSED	b. <u>IF</u> PRZR pressure less than 2335 psig. <u>THEN</u> manually close PORVs.
	<u>IF</u> any PORV can <u>NOT</u> be closed. <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed. <u>THEN</u> dispatch AO to locally check breaker.
	 MOV-515. MCC D position 6C MOV-516. MCC C position 6C
c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP ACTION/EXPECTED RESPON	SE RESPONSE NOT OBTAINED
5 Check Secondary Radiatic Levels - NORMAL	ON Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
o Steamline radiation monit (R-31 and R-32)	or .
o Dispatch AO to locally ch steamline radiation	eck
o Request RP sample S/Gs fo activity	r
	CAUTION
	SI RESET. THEN MANUAL ACTION MAY BE REQUIRED C. (REFER TO ATT-8.5, ATTACHMENT LOSS OF
6 Reset SI	
L	

EOP: TITLE: ECA-2.1 UNCONTROLLED DEPRESSURIZ	ATION OF BOTH STEAM REV: 28
	RATORS PAGE 7 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
SIEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTIC	<u>on</u>
RCS PRESSURE SHOULD BE MONITORED. IF RC	
UNCONTROLLED MANNER TO LESS THAN 250 PS RHR PUMPS MUST BE MANUALLY RESTARTED TO	
* 7 Monitor If RHR Pumps Should	
Be Stopped:	
a. RHR pumps - ANY RUNNING IN	a. Go to Step 8.
INJECTION MODE	
b. Check RCS Pressure:	
	1) Go to E-1, LOSS OF REACTOR OR
250 psig (465 psig adverse CNMT)	SECONDARY COOLANT. Step 1.
2) Pressure - STABLE OR	2) Go to Step 8.
1NCREASING	2, 22 22 2229 21
c. Stop RHR pumps and place in AUTO	
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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	nitor If CNMT Spray Should Stopped:	
а.	CNMT spray pumps - RUNNING	a. Go to Step 9.
b.	Check the following:	b. Continue with Step 9. WHEN BOTH
	o CNMT pressure - LESS THAN 4 PSIG	conditions satisfied, <u>THEN</u> do Steps 8c through f.
	o Sodium hydroxide tank level - LESS THAN 55%	
c.	Reset CNMT spray	
	Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE.
		AOV-836AAOV-836B
	Stop CNMT spray pumps and place in AUTO	
f.	Close CNMT spray pump discharge valves	
	• MOV-860A	
	• MOV-860B • MOV-860C	
	• MOV-860D	

UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
10 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26. CNMT ISOLATION - EXTINGUISHED	b. Perform the following:
ISOLATION - EXTINGUISHED	1) Reset SI.
	2) Depress CI reset pushbutton.
11 Verify Adequate SW Flow:	
a. Check at least two SW pumps ~ RUNNING	a. Manually start SW pumps as powe supply permits (257 kw each).
	<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
	1) Ensure SW isolation.
	2) <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAG SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	3) <u>IF</u> only-one-SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

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2 Establish IA to CNMT:	
 a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	 a. Perform the following: Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie 2) Verify adequate emergency D/capacity to run air compressors (75 kw each). <u>IF NOT</u>, <u>THEN</u> perform the following: Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) CR- Evaluate if CNMT RECIRC fanc should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). <u>WHEN</u> bus 15 rectored, <u>THEN</u> reset control room lighting.
b. Check SW pumps · AT LEAST TWO PUMPS RUNNING	 b. Perform the following: 1) Restore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR)
	2) Go to Step 12d.

	EOP:
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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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 compressors as necessary. d. Verify adequate air compressor(s) - RUNNING d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can be started. <u>THEN</u> start diese air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL COMPRESSOR). e. Check IA supply: e. Perform the following: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 2) Continue with Step 13. <u>I</u> 	 c. Verify SW isolation valves to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressor(s) - RUNNING d. Verify adequate air compressor(s) - RUNNING d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>N</u> be started. <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AI COMPRESSOR). e. Check IA supply: e. Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING c. Perform the following: 2) Continue with Step 13. <u>WHE</u> IA restored. <u>THEN</u> do Steps 	SP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 Verify adequate air compressor(s) - RUNNING Verify adequate air compressor(s) - RUNNING Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can be started. THEN start diese air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL COMPRESSOR). Check IA supply: Pressure - GREATER THAN 60 PSIG Pressure - STABLE OR INCREASING Continue with Step 13. I IA restored. THEN do Step 	 turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 Verify adequate air compressor(s) - RUNNING Verify adequate air compressor(s) - RUNNING Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can M be started. THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AI COMPRESSOR). Check IA supply: Pressure - GREATER THAN 60 PSIG Pressure - STABLE OR INCREASING Continue attempts to restor IA (Refer to AP-IA.1, LOSS INSTRUMENT AIR). Continue with Step 13. WHE IA restored. THEN do Steps 12f and g. 	(Step 12 continued from previous page)
 compressor(s) - RUNNING compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can be started. <u>THEN</u> start diese air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL COMPRESSOR). e. Check IA supply: e. Perform the following: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING continue with Step 13. <u>I</u> IA restored. <u>THEN</u> do Step 	 compressor(s) - RUNNING compressor(s) - RUNNING compressors as power supply permits (75 kw each). IF electric air compressors can M be started. THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AI COMPRESSOR). e. Perform the following: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING f. Reset both trains of XY relays f. Reset both trains of XY relays 	turbine building - OPEN • MOV-4613 and MOV-4670	 Manually align values. Dispatch AO to locally reset
 o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 1) Continue attempts to rest IA (Refer to AP-IA.1, LOS INSTRUMENT AIR). 2) Continue with Step 13. I IA restored, THEN do Step 	 o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 1) Continue attempts to restor IA (Refer to AP-IA.1, LOSS INSTRUMENT AIR). 1) Continue attempts to restor IA (Refer to AP-IA.1, LOSS INSTRUMENT AIR). 2) Continue with Step 13. WHE IA restored, <u>THEN</u> do Steps 12f and g. 		compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NC</u> be started. <u>THEN</u> start diesel air compressor (Refer to ATT-11.2. ATTACHMENT DIESEL AIR
60 PSIG IA (Refer to AP-IA.1, LOS INSTRUMENT AIR). o Pressure - STABLE OR INSTRUMENT AIR). INCREASING 2) Continue with Step 13. IA restored, THEN do Step	60 PSIG 0 Pressure - STABLE OR INCREASING 1NCREASIN	e. Check IA supply:	e. Perform the following:
INCREASING 2) Continue with Step 13. <u>I</u> IA restored, <u>THEN</u> do Step	INCREASING 2) Continue with Step 13. WHE IA restored, <u>THEN</u> do Steps 12f and g. f. Reset both trains of XY relays for IA to CNMT AOV-5392	60 PSIG	1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS C INSTRUMENT AIR).
	for IA to CNMT AOV-5392		
	g. Verify IA to CNMT AOV-5392 - OPEN		
g. Verify IA to CNMT AOV-5392 - OPEN	· · · · · · · · · · · · · · · · · · ·	g. Verify IA to CNMT AOV-5392 - OPEN	·

EOP:		
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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STE	P ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Go to Step 14.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
	 MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
	c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
	• MOV-841 • MOV-865	 Open vent valves for unisolated SI ACCUMs.
		 ACCUM A. AOV-834A ACCUM B, AOV-834B
		2) Open HCV-945.
		<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC for contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-805	
	Check Normal Power Available To Charging Pumps:	Swrify adequate emergency D/G Supacity to run charging pumps 1/5 kw each).
	o Bus 14 normal feed breaker CLOSED	<u>SHOT. THEN</u> evaluate if CNMT SECIRC fans can be stopped (Refer
	o Bus 16 normal feed breaker CLOSED	ATT-4.0. ATTACHMENT CNMT RECIRC (

ECA-2 1 UNCONTROLLED DEPRESSURIZ	1 UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS PAGE 13 of	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
15 Check If Charging Flow Has Been Established:		
a. Charging pumps - ANY RUNNING	a. Perform the following:	
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch AO to close seal injection needle valve(s) to affected RCP: 	
	• RCP A, V-300A • RCP B, V-300B	
	 Ensure HCV-142 open, demand at 0%. 	
 b. Align charging pump suction to RWST: o LCV-112B OPEN 	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump	
o LCV-112C CLOCED	room). <u>IF</u> LCV-112C can <u>NOT</u> be closed, <u>THEN</u> perform the following:	
	 Direct AO to locally open V-358, manual charging pump cuction from RWST (charging pump room). 	
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.	
	3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).	
 c. Start charging pumps as necessary and adjust charging flow to restore FRZP level 		

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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	nitor SI Termination iteria:		
a.	SI pumps - ANY RUNNING	а	. Go to Step 18.
Ъ.	Check RCS pressure: • Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT] • Pressure - STABLE OR INCREASING	Ь	 DO <u>NOT</u> stop SI pumps. Perform the following: 1) Energize PRZR heaters and operate PRZR spray as necessary to stabilize RCS pressure greater than 1625 psig [1825 psig adverse CNMT] 2) Return to Step 2.
	· · · · · · · ·		-
c.	RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	с	. DO <u>NOT</u> stop SI pumps. Return to Step 2.
d.	PRZR level - GREATER THAN 10% [30% adverse CNMT]	d	. Do <u>NOT</u> stop SI pumps. Perform the following:
			1) <u>IF</u> normal PRZR spray available. <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
			2) Return to Step 16a.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : o Following SI termination, RCP a applicable.	trip criteria is no longer
 Foldout Page E-2 transition criperforming steps 17 and 18. 	iteria does not apply while
17 Stop SI and RHR Pumps And Place In Auto	
18 Monitor SI Reinitiation Criteria:	
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and return to Step 2.
b. PRZR level – GREATER THAN 10% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level.
	<u>IF</u> PRZR level can <u>NOT</u> be maintained. <u>THEN</u> manually start SI pumps as necessary and return to Step 2.
19 Check RCS Hot Leg Temperatures - STABLE OR DECREASING	Control feed flow or dump steam to stabilize RCS hot leg temperatures.
20 Check Narrow Range Level In Both S/Gs - LESS THAN 50%	Control feed flow to maintain narrow range level less than 50% in both S/Gs. ·

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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21 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	3) Go to Step 27.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	
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This Step continued on the next page.

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CONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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	• • •	age)	
c. Verify CNMT REG annunciator C-:	2, HIGH		rm the following:
TEMPERATURE ALA	ARM ~ EXTINGUISHED	•	termine required SW flow to W HXs per table:
	SW DISCHARGE ALIGNMENT	CCW HXS IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both H
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30-33" d/p across each HX
	Alternate	1	95–100" d/p across in-service HX
			rect AO to adjust SW flow required value.
		0	IF on normal SW discharge:
			• V-4619. CCW Hx A • V-4620. CCW Hx B
			-OR-
		o	<u>lF</u> on alternate SW discharge:
			 V-4619C, CCW Hx A V-4620B, CCW Hx B

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22 Check If Normal CVCS Operation Can Be Established	
a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN	a. Continue with Step 27. <u>WHEN</u> IA restored. <u>THEN</u> do Steps 22. through 26.
o IA pressure - GREATER THAN 60 PSIG	
b. Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:
	1) Verify MCC A energized.
	 Place instrument bus D on maintenance supply.
c. CCW pumps - ANY RUNNING	c. Perform the following:
	 <u>IF</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A. MOV-749A and MOV-759. RCP B. MOV-749B and MOV-759.
	2) Manually start one CCW pump.
d. Charging pump AN: FUNNING	d. Continue with Step 27. <u>WHEN</u> any charging pump running. <u>THEN</u> do Steps 23 through 26.

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

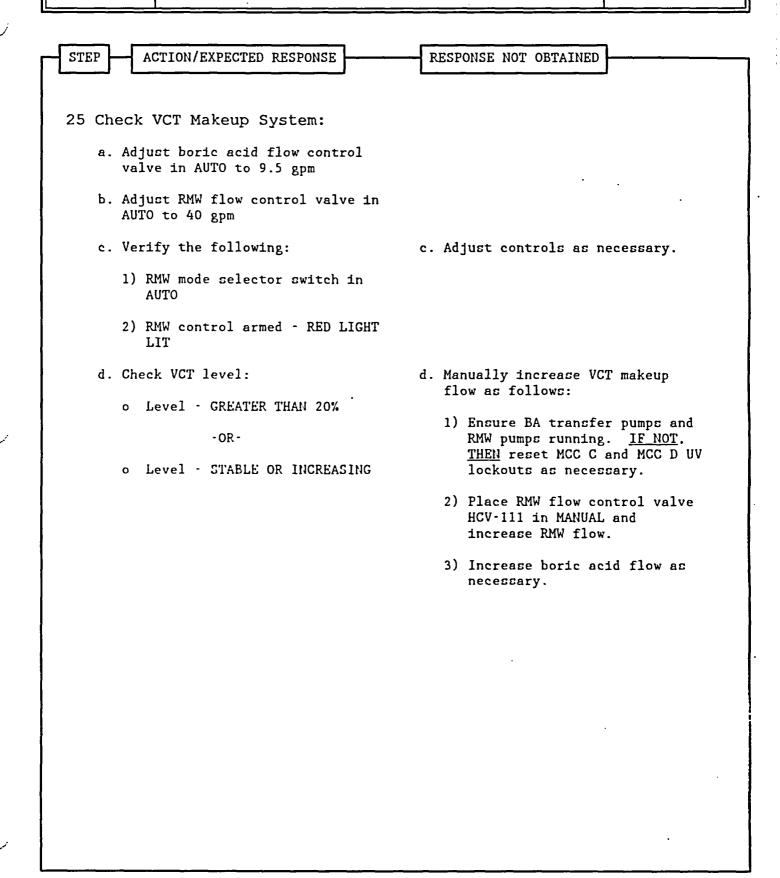
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23 Verify PRZR Level - GF THAN 20% [40% adverse 24 Establish Normal Letdo	
24 Establish Normal Letdo	
 a. Verify charging line fl REGEN Hx - GREATER THAN b. Place the following swi CLOSE: Letdown orifice valve (AOV-200A. AOV-200B. AOV-202) AOV-371. letdown isol valve 	established, <u>THEN</u> establish excess ow to letdown as follows: 20 GPM o Place excess letdown divert tches to valve, AOV-312, to NORMAL. o Ensure CCW from excess letdown open, (AOV-745). and o Open excess letdown isolation
 AOV-427, loop E cold REGEN Hx c. Place letdown controlle MANUAL at 40% open TCV-130 PCV-135 	excess letdown temperature less than 195°F and pressure less
 d. Reset both trains of XY for AOV-371 and AOV 423 e. Open AOV-371 and AOV 41 	relays <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.
f. Open letdown orifice ve necessary	lver ar
g. Place PCV-135 in AUTO #	it 250 peig
h. Place TCV-130 in AUTO a normal setpoint	t"The
i. Adjust charging pump sp HCV-142 as necessary	eed and

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ECA-2.1 UNCONTROLLED DEPRESSURIZA	ATION OF BOTH STEAM RATORS PAGE 21 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26 Check Charging Pump Suction Aligned To VCT:	
a. VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:
	 Ensure charging pump suction aligned to RWST
	o LCV-112B open
	o LCV-112C closed
	2) Continue with Step 27. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 26b.
b. Verify charging pumps aligned to VCT:	b. Manually align valves as necessary.
o LCV-112C - OPEN	
o LCV-112B - CLOSED	

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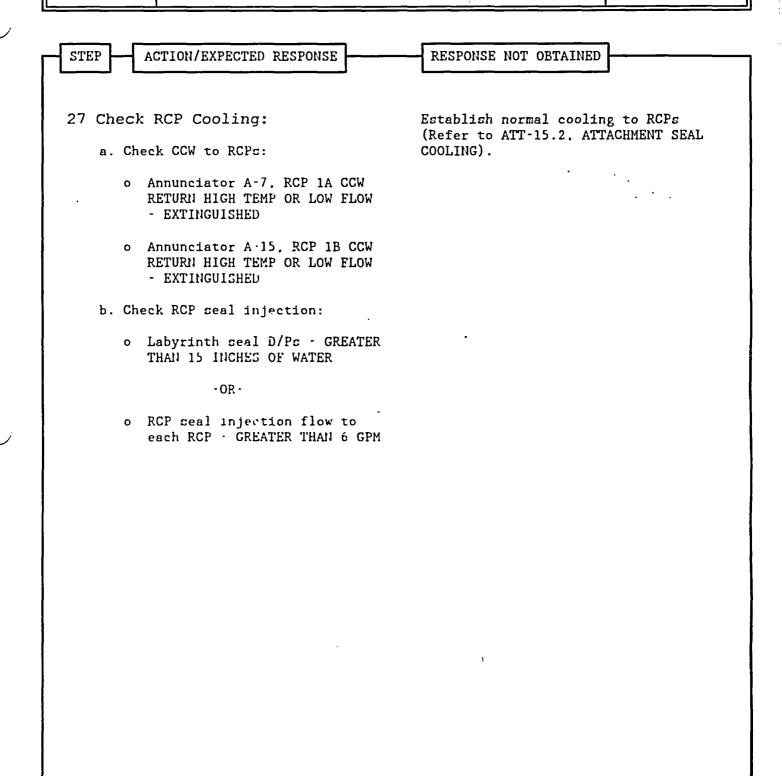
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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28 Check If Seal Return Flow Should Be Established:	
a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 29.
b. Verify RCP seal outlet valves – OPEN	b. Manually open valves as necessary.
 AOV-270A AOV-270B 	
c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
d. Open RCP seal return isolation valve MOV-313	d. Perform the following: 1) Place MOV-313 switch to OPEN.
	 Place MOV-313 Switch to OPEN. Dispatch AO to locally open MOV-313.
e. Verify RCP #1 ceal leakoff flow - LESS THAN 6.0 GPM	e. Perform the following:
	1) Trip the affected RCP
	2) Allow 4 minutes for pump coast down. <u>THEN</u> close the affected RCP seal discharge valve
	 RCP A. AOV-270A RCP B. AOV-270B
	IE both RCP seal discharge valves are shut, <u>THEN</u> go to stop 29.
: Verify RCP #1 seal leakoff flow GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1. RCP SEAL MALFUNCTION.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
SIEF ACTION/EXPECTED RESPONSE	
<u>NOTE</u> : o If auxiliary spray is in use, sp closing normal charging valve AC	pray flow may be increased by DV-294 and normal PRZR spray valves.
o When using PRZR PORV, select one	e with an operable block valve.
29 Energize Heaters And Operate Normal Spray As Necessary To Maintain RCS Pressure Stable	<u>IF</u> normal spray <u>NOT</u> available and letdown is in service. <u>THEN</u> use auxiliary spray valve (AOV-296).
	<u>IF</u> PRZR spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.
	<u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30 Verify All AC Busses - ENERGIZED BY OFFSITE POWER	Perform the following:
o Normal feed breakers to all 480 volt busses – CLOSED	a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed.
o 480 bus voltage - GREATER THAN 420 VOLTS	b. Perform the following, as necessary:
o Emergency D/G output breakers - OPEN	 Close non-safeguards bus tie breakers:
	 Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie
	2) Place the following pumps in PULL STOP:
	• EH pumps • Turning gear oil pump • HP seal oil backup pump
	3) Restore power to MCCs.
	 A from Bus 13 B from Bus 15 E from Bus 15 F from Bus 15
	4) Start HP seal oil backup pump
	5) Ensure D/G load within limits
	6) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting.
	7) Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power.
	c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	LJ
CAUTION	* * * * * * * * * * * * * * * * * * * *
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LO NOT BE STARTED PRIOR TO A STATUS EVALUATIO	
* * * * * * * * * * * * * * * * * * * *	
31 Check RCP Status	
a. Both RCPs - STOPPED	a. Go to Step 32.
b. Check RVLIS level (no RCPs) - ≥ 95%	b. <u>IF</u> RVLIS level (no RCPs) less than 95%. <u>THEN</u> perform the following:
	o Increase PRZR level to greater than 65% [82% adverse CNMT]
	 Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING
	o Energize PRZR heaters as necessary to saturate PRZR water
	<u>lF</u> conditions <u>NOT</u> met. <u>THEN</u> continue with Step 32. <u>WHEN</u> conditions met. <u>THEN</u> do Steps 3lc and d.

This Step continued on the next page.

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	L
(Step 31 continued from previous page)	
c. Establish conditions for starting an RCP:	c. <u>IF</u> conditions can <u>NOT</u> be met, <u>THEN</u> perform the following:
o Ensure Bus 11A or 11B energized.	 Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
o Refer to ATT-15.0, ATTACHMENT RCP START.	<u>IF</u> natural circulation can <u>NOT</u> be verified. <u>THEN</u> increase feed flow or dumping steam.
	2) Go to Step 32.
d. Start one RCP.	d. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	<u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase feed flow or dumping steam.
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STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	rse CNMT conditions or loss o ure of NIS detectors.	f forced air cooling may result in
	If Source Range ors Should Be Energized:	• • • •
	ce range channels - ERGIZED	a. Go to Step 32e.
	Check intermediate range flux - EITHER CHANNEL LESS THAN 10-10 AMPS	b. Perform the following:
		1) <u>IF</u> neither intermediate ra channel is decreasing <u>THEN</u> initiate boration.
		2) Continue with Step 33. <u>WH</u> flux is LESS THAN 10 ⁻¹⁰ an on any operable channel. <u>1</u> do Steps 32c, d and e.
o B	k the following: oth intermediate range hannels - LESC THAN 0-10 AMP:	c. Continue with step 33. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 32d and e.
	-OR-	
	reater than 20 minutes since eactor trip	
	fy cource range detectors GIZED	d. Manually energize source rang detectors by depressing P-6 permissive defeat pushbuttons of 2).
		<u>IF</u> source ranges can <u>NOT</u> be restored. <u>THEN</u> refer to ER-NIS.1. SR MALFUNCTION and to Step 33.
cour	sfer Rk-45 recorder to one ce range and one rmediate range channel.	

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33 Ch	eck If Emergency D/Gs	
	ould Be Stopped:	
а.	Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).
	o Emergency D/G output breakers - OPEN	
	o AC emergency bus voltage - GREATER THAN 420 VOLTS	
	o AC emergency bus normal feed breakers - CLOSED	
b.	Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1. ATTACHMENT D/G STOP)	

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TITLE: UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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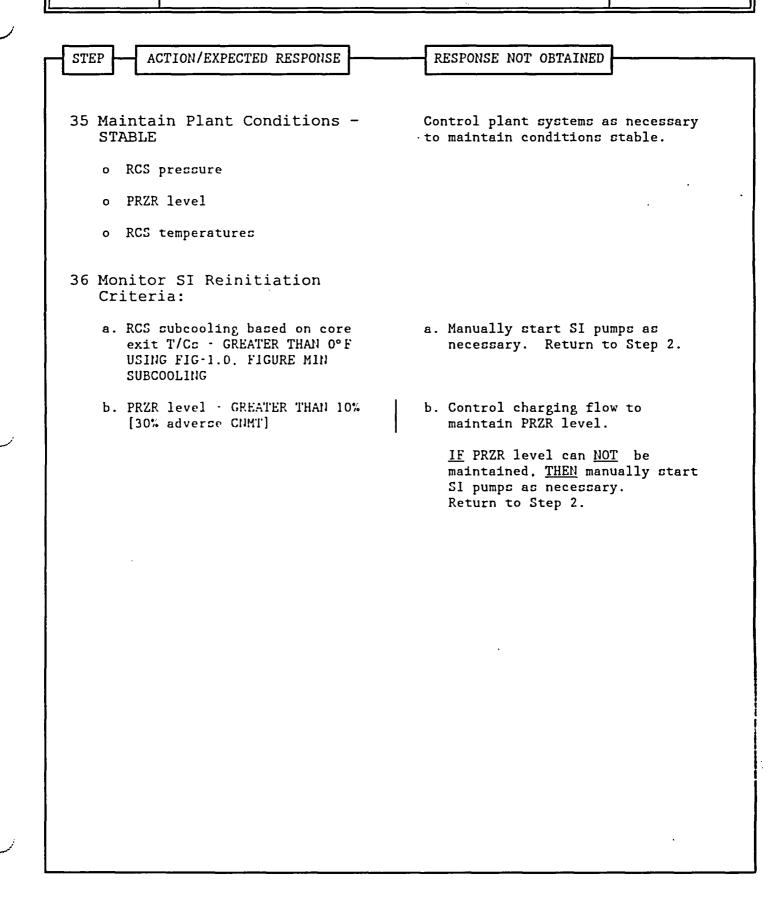
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Establish Normal Shutdown Alignment:	
a. Check condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2.
b. Perform the following:	
o Open generator disconnects	
• 1G13A71 • 9X13A73	
o Place voltage regulator to OFF	
o Open turbine drain valves	
o Rotate reheater steam supply controller cam to close valves	
o Place reheater dump valve switches to HAND	
o Stop all but one condensate pump	
c. Verify adequate Rx head cooling:	
 Verify at least one control rod shroud fan - PUNNING 	1) Manually start one fan as power supply permits (45 kw)
2) Verify one Ex compartment cooling fan - RUNNING	2) Perform the following:
	o Dispatch AO to reset UV relays at MCC C and MCC D.
	o Manually start one fan as power supply permits (23 kw)
d. Verify ATT 12 G. ATTACHMENT 21/ 1 - COMPLETE	

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
J	LJ	L
	ck If SI ACCUMs Should Be lated:	
a.	Check the following:	a. Go to Step 38.
	o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	
	o PRZR level – GREATER THAN 10% [30% adverse CNMT]	
	Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
	 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
c.	Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
	• MOV-841 • MOV-865	1) Open vent valves for unisolated SI ACCUMs.
		 ACCUM A. AOV-834A ACCUM B. AOV-834B
		2) Open HCV-945.
		<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC for contingency actions.
	Locally reopen breakers for MOV-841 and MOV-865	

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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Adequate Shutdown t RP to sample RCS for concentration y boron concentration - ER THAN REQUIREMENTS OF .0. FIGURE SDM CS Hot Leg tures - LESS THAN 350°F	b. Borate as necessary.
t RP to sample RCS for concentration y boron concentration – ER THAN REQUIREMENTS OF .0. FIGURE SDM CS Hot Leg	b. Borate as necessary.
t RP to sample RCS for concentration y boron concentration – ER THAN REQUIREMENTS OF .0. FIGURE SDM CS Hot Leg	b. Borate as necessary.
concentration y boron concentration – ER THAN REQUIREMENTS OF .0. FIGURE SDM CS Hot Leg	b. Borate as necessary.
ER THAN REQUIREMENTS OF .0. FIGURE SDM CS Hot Leg	b. Borate as necessary.
	Control feed flow and dump steam to establish RCS cooldown rate less than 100°F/hr in RCS cold legs.
RCP Operation:	
- ANY RUNNING	a. Go to Step 41.
the following:	b. Stop affected RCP(s).
P #1 seal D/P - GREATER AN 220 PSID	
P #1 ceal leakoff - WITHIN E NORMAL OPERATING RANGE OF G-4.0. FIGURE RCP SEAL AKOFF	
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : o If auxiliary spray is in use, closing normal charging valve	spray flow may be increased by AOV-294 and normal PRZR spray valves.
o When using PRZR PORV, select o	one with operable block valve.
<pre>*41 Check RCS Pressure - LESS THAN 400 PSIG [300 PSIG adverse CNMT]</pre>	 Perform the following: a. Depressurize RCS using normal PRZR spray. <u>IF</u> normal spray <u>NOT</u> available and letdown is in service. <u>THEN</u> use auxiliary spray. <u>IF NOT</u>. <u>THEN</u> use one PRZR PORV. <u>IF IA NOT</u> available. <u>THEN</u> refer to ATT-12.0. ATTACHMENT N2 PORVS. b. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F using FIG-1.0. FIGURE MIN SUBCOOLING.
	c. Return to Step 36.

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TITLE:

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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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Г	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	 42 Check If RHR Normal Cooling Can Be Established: a. RCS cold leg temperature - LESS THAN 350°F b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] c. Place letdown pressure controller (PCV-135) in MANUAL CLOSED 	a. Return to Step 36. b. Return to Step 40.
\smile	 d. Check following valves - OPEN AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	 d. Perform the following: 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice value.
	 e. Verify pressure on PI-135 - LESS THAN 400 PS1G f. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Establish RHR normal cooling (Refer to ATT-14.1. ATTACHMENT RHR COOL) 	 e. Return to Step 40. f. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service. <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
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EOP:	
E	CA-2.1

UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	ontinue RCS Cooldown To Cold hutdown:	
а	. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
Ъ	. Check narrow range level in both S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in both S/Gs.
44 C T	heck Core Exit T/Cs - LESS HAN 200°F	Return to Step 43.
45 E S	valuate Long Term Plant tatus:	
a	. Maintain cold shutdown conditions	
b	. Consult TSC	
	El	10 -
		· · · · ·

EOP:

ECA-2.1 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT FAULTED S/G (ATT-10.0)
- 6) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 7) ATTACHMENT NC (ATT-13.0)
- 8) ATTACHMENT RCP START (ATT-15.0)
- 9) ATTACHMENT N2 PORVS (ATT-12.0)
- 10) ATTACHMENT SEAL COOLING (ATT-15.2)
- 11) ATTACHMENT SI/UV (ATT 8.4)
- 12) ATTACHMENT D/G STOP (ATT-8.1)
- 13) ATTACHMENT SD-1 (ATT 17.0)
- 14) ATTACHMENT SD-2 (ATT 17.1)
- 15) ATTACHMENT RHF COOL (ATT 14.1)
- 16) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 18) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 19: FOLDOUT

EOP:	-		
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UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS

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RED PATH SUMMARY

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F <u>AND</u> RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% [25% adverse CNMT] <u>AND</u> total feedwater flow less than 200 gpm
- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

EOP:

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1. LOSS OF SW_CRITERIA_

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
- 2. SI REINITIATION CRITERIA

Manually start SI pumps as necessary if <u>EITHER</u> condition listed below occurs:

- RCS subcooling based on core exit TCs LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING
- o PRZR level CHARGING CAN NOT CONTROL LEVEL GREATER THAN 10% |
 [30% ADVERSE CNMT]
- 3. <u>E-2_TRANSITION_CRITERIA</u>

<u>IF</u> any S/G pressure increases at any time (except while performing SI termination in Steps 17 and 18), <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

IF RWST level decreases to less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

5. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

6. E-3 TRANSITION CRITERIA

<u>IF</u> any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation, <u>THEN</u> manually start SI pumps as necessary <u>AND</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

EOP:	ITLE:	REV: 27
ECA-3.1	SGTR WITH LOSS OF RE	EACTOR COOLANT -
ECA-3.1	SUBCOOLED RECOV	VERY DESIRED PAGE 1 of 39

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	
ECA-3.	1

A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS for an SGTR concurrent with a LOCA (i.e. Ruptured-Faulted S/G).

B. ENTRY CONDITIONS/SYMPTOMS

TITLE:

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured . S/G can not be isolated from any intact S/G.
 - b. E-3, STEAM GENERATOR TUBE RUPTURE, if PRZR PORV can not be isolated by closing its block valve.
 - c. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured S/G is faulted.
 - d. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if no intact S/G is available for RCS cooldown.
 - e. E-3, STEAM GENERATOR TUBE RUPTURE, if minimum D/P between ruptured and intact S/G cannot be maintained.
 - f. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS subcooling is less than required.
 - g. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS pressure does not increase after closing PRZR PORV and block valve.
 - h. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI can not be terminated.
 - i. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI is reinitiated after termination.
 - j. E-3, STEAM GENERATOR TUBE RUPTURE, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if SI accumulators should not be isolated.

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ECH-2.1	SUBCOOLED RECOVERY DESIRED	PAGE 3 of 39

k. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if a non-ruptured S/G is not available for RCS cooldown.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTI	<u>on</u>
IF OFFSITE POWER IS LOST AFTER SI RESET TO RESTART SAFEGUARDS EQUIPMENT. (REFE OFFSITE POWER)	
<u>NOTE</u> : o Foldout page should be open AN	D monitored periodically.
o Adverse CNMT values should be greater than 4 psig or CNMT ra	used whenever CNMT pressure is diation is greater than 10 ⁺⁰⁵ R/hr.
l Reset SI	
2 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following:
	1) Reset SI.
	2) Depress CI reset pushbutton.
· · · · · · · · · · · · · · · · · · ·	

EOP:	SGTR WITH LOSS OF	REACTOR COOLANT - REV: 27
ECA-3.1	SUBCOOLED REC	OVERY DESIRED PAGE 5 o
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3 Verify	Adequate SW Flow:	
a. Chec RUNN	ek at least two SW pumps – NING	a. Manually start SW pumps as powe supply permits (257 kw each).
		<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
		1) Ensure SW isolation.
		2) <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	-	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAG SHUTDOWN pushbutton.
		b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
		3) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
shut	Datch AO to establish normal down alignment (Refer to 17.0, ATTACHMENT SD-1)	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Establish IA to CNMT:	
 a. Verify non-safeguards busses energized from offsite power b. Bus 13 normal feed - CLOSED -OR- b. Bus 15 normal feed - CLOSED 	 a. Perform the following: 1) Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN perform the following: o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- 6 Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	 b. Perform the following: 1) Restore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). 2) Go to Step 4d.
 c. Verify SW isolation values to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 This Step continued on the next page. 	 c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.

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Г	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 4 continued from previous page)	
	d. Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started. <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
	e. Check IA supply:	e. Perform the following:
	o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	 Continue attempts to restore IA (Refer to AP-IA.1. LOSS OF INSTRUMENT AIR). Continue with Step 5. <u>WHEN</u> IA restored. <u>THEN</u> do Steps 4f and g.
\cup	f. Reset both trains of XY relays for IA to CNMT AOV-5392	
	g. Verify IA to CNMT AOV-5392 · OPEN	

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STEP ACTION/EXPECTED RESPO	ISE RESPONSE NOT OBTAINED
 * 5 Monitor All AC Busses - BUSSES ENERGIZED BY OFF POWER Normal feed breakers to volt busses - CLOSED 480 bus voltage - GREATE 420 VOLTS Emergency D/G output bre OPEN 	SITE a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed: b. Perform the following, as necessary: 1) Close non-safeguards bus tie

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STEP ACTION/EXPECT	ED RESPONSE	RESPONSE NOT OBTAINED	
	CAUT	<u> </u>	* * *
PRZR HEATERS SHOULD NO MINIMUM RECOMMENDED BY		TIL PRZR LEVEL INDICATES GREATER TH	AN
* * * * * * * * * * * * *			* * *
6 Deenergize PRZR	Heaters		
a. Place PRZR propo in PULL STOP	ortional heaters		
b. Place PRZR backu	up heaters to OFF		
c. Consult TSC for minimum indicate that will ensure covered.	ed PRZR level		

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* 7 Monitor If CNMT Spray Should	
Be Stopped:	
a. CNMT spray pumps – ANY RUNNING	a. Go to Step 8.
b. Check the following:	b. Continue with Step 8. WHEN BOT
o CNMT pressure – LESS THAN 4 PSIG	conditions satisfied. <u>THEN</u> do Steps 7c through f.
o Sodium hydroxide tank level - LESS THAN 55%	
c. Reset CNMT spray	
d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE.
	AOV-836AAOV-836B
e. Stop CNMT spray pumps and place in AUTO	
f. Close CNMT spray pump discharge valves	
 MOV-860A MOV-860B 	
MOV-860CMOV-860D	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	* * * * * * * * * * * * * * * * * * * *
CAUTI	<u>00</u>
IF ANY RUPTURED S/G IS FAULTED, FEED FL	
DURING SUBSEQUENT RECOVERY ACTIONS UNLE	SS NEEDED FOR RCS COOLDOWN.
	* * * * * * * * * * * * * * * * * * * *
8 Check Ruptured S/G Level:	
a. Narrow range level · GREATER	a. <u>IF</u> ruptured S/G <u>NOT</u> faulted.
THAN 7% [25% adverse CNMT]	THEN perform the following:
	1) Maintain feed flow to
	ruptured S/G until level
	greater than 7% [25% adverse CNMT].
	-
·	2) Continue with Step 9. <u>WHEN</u> ruptured S/G level greater
	than 7% [25% adverse CNMT].
	<u>THEN</u> do Steps 8b through e.
b. Close MDAFW pump discharge valve to ruptured S/G	b. Dispatch AO to locally close valve.
•	VAIVE.
 S/G A. MOV-4007 S/G B. MOV-4008 	
c. Pull stop MDAFW pump for ruptured S/G	
d. Close TDAFW pump flow control valve to ruptured S/G	d. Dispatch AO with locked valve key to locally close TDAFW pump
	manual feedwater isolation valv
 S/G A. AOV-4297 S/G B. AOV-4298 	to ruptured S/G.
- 0.0 5. 101 1.70	• 3/G A. V-4005
	• S/G B. V-4096
e. Verify MDAFW pump crossile	e. Manually close valves.
valves - CLOSED	- -
• MOV-4000A	
• MOV-4000B	

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
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	<u>CAUTI</u>	<u>on</u>	
UNCONTE	SSURE SHOULD BE MONITORED. IF R COLLED MANNER TO LESS THAN 250 PS MPS MUST BE MANUALLY RESTARTED TO	IG [465 PSIG ADVERSE CNMT], THEN THE	
* * * *	* * * * * * * * * * * * * * * *		*
	itor If RHR Pumps Should Stopped:		
	CHR pumps - ANY RUNNING IN INJECTION MODE	a. Go to Step 10.	
ь. С	Check RCS pressure:	b. Go to Step 10.	
c	9 Pressure – GREATER THAN 250 psig [465 psig adverse CNMT]		
c	Pressure - STABLE OR INCREASING		
c. S	Stop RHR pumps and place in AUTO		

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 Evaluate Plant Status:	
a. Check auxiliary building radiation - NORMAL	a. Notify RP and refer to appropriate AR-RMS procedure
 Plant vent iodine (R-10B) Plant vent particulate (R-13) Plant vent gas (R-14) 	
 CCW liquid monitor (R-17) Letdown line monitor (R-9) CHG pump room (R-4) 	
b. Direct RP to obtain following samples:	
 RCS boron RCS activity CNMT hydrogen CNMT sump boron CNMT sump pH 	
c. Verify adequate Rx head cooling:	
1) Verify at least one control rod shroud fan - RUNNING	 Manually start one fan_as power supply permits (45 kw).
2) Verify one Rx compartment cooling fan RUNNING	2) Perform the following:
	o Dispatch AO to reset UV relays at MCC C and MCC D.
	o Manually start one fan as power supply permits (23 kw).

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11 Establish 75 GPM Charging Flow:	
a. Charging pumps - ANY RUNNING	 a. Perform the following: 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally isolate seal injection to affected RCP. RCP A. V-300A RCP B. V-300B
	2) Ensure HCV-142 open.
 b. Align charging pump suction to RWST: o LCV-112B · OPEN o LCV-112C · CLOSED 	 b. <u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch AO to locally open V-358. manual charging pump suction from RWST (charging pump room). <u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following: 1) Direct AO to locally open V-358. manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
 c. Start charging pumps as necessary and establish /5 gpm total charging flow Charging line flow Seal injection 	

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
I	heck If S/G Secondary Side s Intact: Pressure in both S/Gs - STABLE OR INCREASING Pressure in both S/Gs - GREATER THAN 110 FSIG	 <u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized. <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown: Steamlines Feedlines <u>IF NOT. THEN</u> go to E-2. FAULTED STEAM GENERATOR ISOLATION, Step 1.
<u>NOTE</u> :	TDAFW pump flow control AOVs may d	rift open on loss of IA.
*13 M	onitor Intact S/G Levels:	
a	. Narrow range level - GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in intact S/G.
Ь	. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner. <u>THEN</u> consider isolating unnecessary release paths:
		 TDAFW pump steam supply values S/G blowdown values Refer to ATT-16.0. ATTACHMENT RUPTURED S/G

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STE	EP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOT</u>	<u>'E</u> : Shutdown margin should be monitored FIG-2.0, FIGURE SDM).	during RCS cooldown (Refer to
14	Initiate RCS Cooldown To Cold Shutdown:	
	a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	 .
	b. Use RHR system if in service	
	c. Dump steam to condenser from intact S/G	c. Manually or locally dump steam using intact S/G ARV.
		<u>IF</u> no intact S/G available, and RHR system <u>NOT</u> in service, <u>THEN</u> perform the following:
		o Use faulted S/G.
		- OR -
		o Use ruptured S/G.
*15	Monitor Conditions For Subcooled Recovery:	
	a. Check RWST level - GREATER THAN 50%	a. <u>IF</u> CNMT sump B level is less than 113 inches. <u>THEN</u> go to ECA-3.2. SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED. Step 1.
	b. Check ruptured S/G narrow level - LESS THAN 90% [80% adverse CNMT]	b. Consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED

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<i>.</i> ·	SUBCOOLED RECOVERY DESIRED	PAGE 17 of 39
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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	J
	<pre>16 Check RCS Subcooling Based On Go to Step 28. Core Exit T/Cs - GREATER THAN 0° USING FIG-1.0, FIGURE MIN SUBCOOLING</pre>	· .
	17 Check Safeguards Pump Status Go to Step 24.	
	o SI pumps - ANY RUNNING	
	- OR -	
	o RHR pumps - ANY RUNNING IN INJECTION MODE	
	18 Check PRZR level - LESS THAN Go to Step 20. 20% [40% adverse CNMT]	
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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
	CAUTION
	THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.
	<u>NOTE</u> : o When using PRZR PORV, select one with an operable block valve.
	o If auxiliary spray is in use, then spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.
	19 Depressurize RCS To Refill PRZR:
	a. Use normal PRZR spray valve associated with running RCP ATT-12.0, ATTACHMENT N2 PORVS.
\smile	 RCP A. PCV-431A RCP B. PCV-431B IF no PORV available. THEN use auxiliary spray valve.
	b. PRZR level - GREATER THAN 20% [40% adverse CNMT] b. Continue with Step 20. <u>WHEN</u> level greater than 20% [40% adverse CNMT]. <u>THEN</u> stop RCS depressurization.
	c. Stop RCS depressurization
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CAUTION • IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP SHOULD NOT BE STARTED FRIOR TO A STATUS EVALUATION. • INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST. 20 Check If An RCP Should Be Started: a. Both RCPs - STOPPED a. Stop all but one RCP and go to Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 20%. [40% adverse CIMT] d. Try to start wh RCP 1) Establish conditions for starting an RCP o Bus 11A o: 11F energized: o Refer to ATT 15.0. ATTACHMENT RCF START 2) Start one RCP	NOT BE 0 INADVE	P SEAL COOLING HAD PREVIOU E STARTED PRIOR TO A STATU	SLY BEEN LOS	
 IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST. 20 Check If An RCP Should Be Started: a. Both RCPs - STOPPED b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 20%. [40% adverse GNMT] d. Try to start an RCP i) Establish conditions for starting an RCP o. Refer to ATT 15.0. ATTACHMENT RCP STARTED 	NOT BE	P SEAL COOLING HAD PREVIOU E STARTED PRIOR TO A STATU	SLY BEEN LOS	
 IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST. 20 Check If An RCP Should Be Started: a. Both RCPs - STOPPED b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 20%. [40% adverse GNMT] d. Try to start an RCP i) Establish conditions for starting an RCP o. Refer to ATT 15.0. ATTACHMENT RCP STARTED 	NOT BE	P SEAL COOLING HAD PREVIOU E STARTED PRIOR TO A STATU	SLY BEEN LOS	
NOT BE STARTED PRIOR TO A STATUS EVALUATION. • INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST. 20 Check If An RCP Should Be Started: a. Both RCPs - STOPPED a. Stop all but one RCP and go to Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 20% [40% adverse CHMT] d. Try to start an RCP 1) Establish conditions for starting an RCP • Bus 11A of 11F energized • Refer to ATT 15.0. ATTACHMENT RCP START	NOT BE	E STARTED PRIOR TO A STATU		
IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST. 20 Check If An RCP Should Be Started: a. Both RCPs - STOPPED a. Stop all but one RCP and go to Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 201. [40% adverse CMMT] d. Try to start an RCP 1) Establish conditions for starting an PCP o Bus 11A o: 11F energized o Refer to ATT 15.0. ATTACHMENT RCF START		TRTENT CRITICALITY MAY OCC		•
Started: a. Both RCPs - STOPPED a. Stop all but one RCP and go to Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING b. Go to Step 28. c. PRZR level - GREATER THAN 20% [40% adverse CNMT] c. Return to Step 18. d. Try to start an RCP 1) Establish conditions for starting an RCP o Bus 11A or 11b energized! o Refer to ATT 15.0. ATTACHMENT RCF START				
Started: a. Both RCPs - STOPPED a. Stop all but one RCP and go to Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING b. Go to Step 28. c. PRZR level - GREATER THAN 20% [40% adverse CHMT] c. Return to Step 18. d. Try to start an RCP i. Establish conditions for starting an RCP o Bus 11A or 11b energized! o Refer to ATT 15.0. ATTACHMENT RCP START	* * * * *		• • • • • •	* * * * * * * * * * * * * * * * * *
Step 21. b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING b. Go to Step 28. c. PRZR level - GREATER THAN 20% [40% adverse CHMT] c. Return to Step 18. d. Try to start an RCP . 1) Establish conditions for starting an RCP . o Bus 11A o: 11b energized! . o Refer to ATT 15.0. ATTACHMENT RCP START .				
exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 20% [40% adverse CNMT] d. Try to start an RCP 1) Establish conditions for starting an RCP o Bus 11A or 11b energized o Refer to ATT 15.0. ATTACHMENT RCP START	a. Bot	:h RCPs - STOPPED		
<pre>[40% adverse CHMT] d. Try to start an RCP 1) Establish conditions for starting an RCP o Bus 11A or 11E energized o Refer to ATT 15.0. ATTACHMENT RCP START</pre>	exi US]	it T/Cs - GREATER THAN 0°F ING FIG-1.0. FIGURE MIN		30 to Step 28.
 1) Establish conditions for starting an RCP o Bus 11A or 11b energized o Refer to ATT 15.0. ATTACHMENT RCP START 			. c	Return to Step 18.
starting an RCP o Bus 11A or 11E energized o Refer to ATT 15.0. ATTACHMENT RCP START	d. Try	y to start an RCP		
o Refer to ATT 15.0. ATTACHMENT RCP START	1)			
ATTACHMENT RCP START		o Bug 11A or 11E energie	.e+-}	
2) Start one RCP				
	2)	Start one RCP		

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21 Check If One Of Three SI Pumps Should Be Stopped:	
a. Three SI pumps – RUNNING	a. Go to Step 22.
b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIG-1.0, FIGURE MIN SUBCOOLING	b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT], <u>OR</u> <u>IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 28.
	<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT]. <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 21c. <u>IF</u> no RHR pump can be started in injection mode. <u>THEN</u> go to Step 28.
c. Check PRZR level · GREATER THAN 20% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 18.
d. Stop one SI pump	

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Should Be Sto	Of Two SI Pumps opped:		
a. Two SI pumps	s - RUNNING	a. Go to	o Step 23.
b. Determine ro subcooling :			
Charging Pump Availability	RCS Subcooling Crite	ria	
NONE	120°F [200°F adverse	CNMT]	
ONE	115°F [190°F adverse	CNMT]	
TWO	105°F [180°F adverse	CNMT]	
THREE	100°F [175°F adverse	CNMT]	
exit T/Cs - FROM TABLE A	ing based on core GREATER THAN VALUE ABOVE USING FIG-1.0. SUBCOOLING	great adve	CS hot leg temperatures ter than 320°F [310°F rse CNMT]. <u>OR IF</u> RHR normal ing in service. <u>THEN</u> go to 28.
FIGURE MIN :		serv	HR normal cooling <u>NOT</u> in ice <u>AND</u> RCS hot leg eratures less than 320°F
FIGURE MIN :		serv: tempe [310 ensu runn: to St be st	ice <u>AND</u> RCS hot leg

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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.

B Check If Last Be Stopped:	: SI Pump Should		
a. One SI pump	- RUNNING	inje	ny RHR pump running in ction mode, <u>THEN</u> go to 28. <u>IF NOT, THEN</u> go to 24.
b. Determine re subcooling f			
Charging Pump Availability	RCS Subcooling Cr:	iteria	
NONE	Insufficient subcool stop SI pump.	ling to	
ONE	255°F [295°F adverse	e CNMT]	
TWO	235°F [285°F advers	e CNMT]	
THREE	210°F [270°F advers	e CNMT]	
exit T/Cc -	GREATER THAN VALUE ABOVE USING FIG-1.0.	grea adve cool: Step	
		serv: tempo [310 ensus runn: to S be st	HR normal cooling <u>NOT</u> in ice <u>AND</u> RCS hot leg eratures less than 320°F 'F adverse CNMT]. <u>THEN</u> re at least one RHR pump ing.in.injection.mode.and go tep 23d. <u>IF</u> no RHR pump can tarted in injection mode. go to Step 28.
d. PRZR level [40% adverse	GREATER THAN 20% CNMT]	d. Do <u>N(</u> Step	<u>OT</u> stop SI pump. Return to 18.
	s SI pump		

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TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
L		L
E	Check If Charging Flow Should Be Controlled To Maintain PRZR Level:	
	a. Check RHR pumps – RUNNING IN INJECTION MODE	a. Start charging pumps and control charging flow to maintain PRZR level and go to Step 25.
ł	b. Go to Step 28	
	-	

EOP:	
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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

STE		ACTION/EXE	PECTED RESPONSE			SPONSE NOT OBTAINED
* *	* *	* * * * * *		<u>CAUTION</u>	* *	
ο			LING HAD PREVIOU PRIOR TO A STATU			T. THEN THE AFFECTED RCP SHOULD
ο			TICALITY MAY OCC HE RUPTURED LOOP			NATURAL CIRCULATION COOLDOWN FIRST.
* *	* *	* * * * * *	* * * * * * * *	k # # # #	* *	
25	Chec	ck RCP Sta	tus			
	a. B	oth RCPs - 3	STOPPED			Stop all but one RCP and go to Step 26.
		heck RVLIS : 95%	level (no RCPs)	-		<u>IF</u> RVLIS level (no RCPs) less than 95%, <u>THEN</u> perform the following:
						o Increase PRZR level to greater than 65% [82% adverse CNMT]
						o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING
						o <u>WHEN</u> PRZR level indicates greater than minimum recommended by TSC. <u>THEN</u> energize PRZR heaters as necessary to saturate PRZR water
						<u>IF</u> conditions <u>NOT</u> met. <u>THEN</u> continue with Step 26. <u>WHEN</u> conditions met. <u>THEN</u> do Steps 25c and d.

This Step continued on the next page.

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TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 25 continued from previous page)
c. Establish conditions for starting an RCP:	c. <u>IF</u> conditions can <u>NOT</u> be met. <u>THEN</u> perform the following:
o Ensure bus 11A or 11B energized.) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
o Refer to ATT-15.0. ATTACHMENT RCP START.	<u>IF</u> natural circulation can <u>NOT</u> be verified. <u>THEN</u> increase dumping steam.
	2) Go to Step 26.
d. Start one RCP	d. <u>IF</u> an RCP can <u>NOT</u> be started. <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	<u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam.

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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	P ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* *	<u>CAUTIO</u>	* * * * * * * * * * * * * * * * * * *
0	THE UPPER HEAD REGION MAY VOID DURING RUNNING. THIS WILL RESULT IN A RAPID	G RCS DEPRESSURIZATION IF RCPS ARE NOT DLY INCREASING PRZR LEVEL.
ο	IF SI HAS BEEN TERMINATED. THE ACCUMS DEPRESSURIZING THE RCS TO LESS THAN D	
* *	* * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTI</u>	<u>E:</u> o <u>WHEN</u> using a PRZR PORV. <u>THEN</u> se valve.	elect one with an operable block
		then spray flow may be increased by AOV-294 and normal PRZR spray valves.
	Depressurize RCS To Minimize RCS Subcooling:	
	a. Depressurize using normal PRZR spray if available	a. Depressurize using one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
		<u>IF</u> no PORV available. <u>THEN</u> use auxiliary spray valve (AOV-296).
	b. WHEN PRZR level indicates greater than minimum recommended by TSC. <u>THEN</u> energize FELF heaters as necessary.	
	greater than minimum recommended by TSC, <u>THEN</u> energize FELF	
	<pre>greater than minimum recommended by TSC, <u>THEN</u> energize FEEF heaters as necessary c. Depressurize RCS until EITHEE of the following conditions</pre>	
	<pre>greater than minimum recommended by TSC. THEN energize FEUF heaters as necessary c. Depressurize ECS until EITHEE of the following conditions satisfied:</pre>	

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STEP ACTION/EXI	PECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : Leakage from concentratio		CS will dilute RCS boron
27 Verify Adequa Margin	te Shutdown	· .
a. Direct RP-to ruptured S/G concentratio		
	concentration - REQUIREMENTS OF URE SDM	b. Borate as necessary.
28 Monitor SI Re Criteria:	initiation	
exit T/Cs -	ng based on core GREATER THAN O°F O. FIGURE MIN	a. Manually start SI pumps as necessary and go to Step 29.
b. PRZR level – [30% adverse	GREATER THAN 10% CNMT]	b. Manually start SI pumps as necessary and return to Step 18.

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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9 Check If SI ACCUMs Should Be Isolated:	
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN	a. <u>IF</u> both RCS hot leg temperatures less than 400°F. <u>THEN</u> go to Step 29c.
SUBCOOLING	IF NOT. THEN go to Step 30.
b. PRZR level – GREATER THAN 10% [30% adverse CNMT]	b. Return to Step 18.
c. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
d. Close SI ACCUM discharge valves	d. Vent any unisolated ACCUMs:
MOV-841MOV-865	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A, AOV-834A ACCUM B, AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.
e. Locally reopen breakers for MOV-841 and MOV-865	· ·

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	ould Be Stopped:	
а.	Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION
·	o Emergency D/G output breakers - OPEN	OF OFFSITE POWER).
	o AC emergency bus voltage - GREATER THAN 420 VOLTS	
	o AC emergency bus normal feed breakers - CLOSED	
b.	Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1. ATTACHMENT D/G STOP)	
	nimize Secondary System ntamination:	
а.	Isolate reject from hotwell to CST:	a. <u>IF</u> hotwell level increasing. <u>THEN</u> direct RP to sample hotwells for activity.
	o Place hotwell level controller (HC-107) in MANUAL at 50%	Notwerra for accivity.
	o Verify hotwell level - STABLE	
	Verify local actions to complete isolation of ruptured S/G (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G)	
b.		
D.		

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
	1) <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
	3) Go to Step 33.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	

This Step continued on the next page.

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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(Step 32 continu	ied from previous pa	age)	
c. Verify CNMT RI annunciator C· TEMPERATURE AI		1) De	rm the following: termine required SW flow to W HXs per table:
	SW DISCHARGE ALIGNMENT	CCW HX5 IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30-33" d/p across each HX
	Alternate	1	95-100" d/p across in-service HX
			rect AO to adjust SW flow required value.
		0	<u>IF</u> on normal SW discharge:
			 V-4619. CCW Hx A V-4620. CCW Hx B
			- OR -
		0	<u>IF</u> on alternate SW discharge:
			 V-4619C, CCW Hx A V-4620B, CCW Hx B

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED REV: 27

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33 Check RCP Cooling a. Check CCW to RCPc	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).
o Annunciator A-7. RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	· · · ·
 Annunciator A-15. RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW EXTINGUISHED 	
b. Check RCP seal injection	
o Labyrinth seal D/Ps – GREATER THAN 15 INCHES OF WATER	
- OR -	
o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	
· ·	

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34 Check If Seal Return Flow Should Be Established:	
a. Verify instrument bus D – ENERGIZED	a. Perform the following:
	1) Ensure steam dump mode control in MANUAL.
	 Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 35.
c. Verify RCP seal outlet valves - OPEN	c. Manually open valves as necessary.
 AOV-270A AOV-270B 	
d. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e. Open RCP seal return isolation valve MOV-313	e. Perform the following:
VALVE MOV-515	1) Place MOV-313 switch to OPEN
	 Dispatch AO to locally open MOV-313.
f. Verify RCP #1 ceal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following:
- LESS THAT 0.0 GFM	1) Trip the affected RCP
	2) Allow 4 minutes for pump coast down. <u>THEN</u> close the affected RCP seal discharge valve
	 RCP A. AOV-270A RCP B. AOV-270B
	<u>iř</u> both-RCP seal discharge valves are shut. <u>THEN</u> go to Step 35.
g. Verify RCP #1 ceal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1. RCP SEAL MALFUNCTION.

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> :	Adverse CNMT conditions or loss of failure of NIS detectors.	forced air cooling may result in
	eck If Source Range tectors Should Be Energized:	
a.	Source range channels – DEENERGIZED	a. Go to Step 35e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN	b. Perform the following:
	10-10 AMPS	 <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration.
	2) Continue with Step 36. <u>WHEN</u> flux is LESS THAN 10 ⁻¹⁰ amps on any operable channel. <u>THEN</u> do Steps 35c. d and e.	
c.	Check the following:	c. Continue with Step 36. <u>WHEN</u> either condition met, THEN do
	o Both intermediate range channels - LESS THAN 10-10 AMPS	Steps 35d and e.
	- OR -	
	o Greater than 20 minutes since reactor trip	
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).
		<u>IF</u> source ranges can <u>NOT</u> be restored. <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 36.
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel	

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	blish Normal Shutdown nment:	
a.Cł	neck condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2.
ь. Ре	erform the following:	
o	Open generator disconnects	
	• 1G13A71 • 9X13A73	
ο	Place voltage regulator to OFF	
ο	Open turbine drain valves	
o	Rotate reheater steam supply controller cam to close valves	
o	Place reheater dump valve switches to HAND	
0	Stop all but one condensate pump	
	erify ATT-1/.0. ATTACHMENT SD-1 COMPLETE	
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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED •

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION	<u>.</u>
FEED FLOW SHOULD NOT BE ESTABLISHED TO AN UNLESS IT IS NEEDED FOR RCS COOLDOWN.	NY RUPTURED S/G WHICH IS ALSO FAULTED
• • • • • • • • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * * * *
*37 Monitor Ruptured S/G(s) Narrow Range Level - GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.
THEN I'VE [20% AUVEISE CHAI]	<u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G unless needed for RCS cooldown:
	 Ruptured S/G pressure decreases in an uncontrolled manner.
	-OR-
	 Ruptured S/G pressure increases to 1020 psig.
*38 Monitor RCP Operation:	
a. RCPs - ANY RUNNING	a. Go to Step 39.
b. Check the following:	b. Stop affected RCP(s).
o RCP #1 seal D/P - GREATER THAN 220 PSID	
o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0. FIGURE RCP SEAL LEAKOFF	

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED REV: 27

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39 Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG	Manually or locally dump steam using intact S/G ARV.
·	<u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> :
	o Use faulted S/G.
	- OR -
	o Use ruptured S/G.
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ECA-3.1

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0 Check If RHR Normal Cooling Can Be Established:	
a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 41.
b. RCS pressure – LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 41.
c. Place letdown pressure controller in MANUAL CLOSED	
d. Check following valves - OPEN	d. Perform the following:
 AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx At least one letdown orifice 	 Reset both trains of XY relays for AOV-371 and AOV-427. Open AOV-371 and AOV-427.
valve (AOV-200A, AOV-200B, or AOV-202)	 3) Open one letdown orifice valve.
e. Verify pressure on PI-135 · LESS THAN 400 PSIG	e. Go to Step 41.
f. Place RCS overpressure protection system in service (Refer to 0.4. ALIGNMENT AND OPERATION OF THE REACTOF VESSEL OVERPRESSURE PROTECTION SYSTEM)	
g. Consult TSC to determine if EHF normal cooling should be established using ATT-14.1. ATTACHMENT RHE COOL	

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SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED

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STEP ACTION/EX	PECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : This procedu sample in St		ied while obtaining CNMT hydrogen
41 Check CNMT Hy Concentration		· .
a. Direct RP to monitors as	o start CNMT hydroger necessary	1
b. Hydrogen con THAN 0.5%	centration - LESS	b. Consult TSC to determine if hydrogen recombiners should be placed in service.
42 Check Core Ex THAN 200°F	kit T/Cs - LESS	Return to Step 9.
43 Evaluate Long Status:	g Term Plant	
a. Maintain col	d shutdown condition	າຍ
b. Consult TSC		
		- END -

EOP:

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ECA-3.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY

TITLE:

- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 6) ATTACHMENT SI/UV (ATT-8.4)
- 7) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 8) ATTACHMENT N2 PORVS (ATT-12.0)
- 9) ATTACHMENT RCP START (ATT-15.0)
- 10) ATTACHMENT D/G STOP (ATT-8.1)
- 11) ATTACHMENT SEAL COOLING (ATT-15.2)
- 12) ATTACHMENT SD-1 (ATT-17.0)
- 13) ATTACHMENT SD-2 (ATT-17.1)
- 14) ATTACHMENT RHR COOL (ATT 14.1)
- 15) ATTACHMENT NC (ATT 13.0)
- 16) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 18) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 19) FOLDOUT

EOP:	
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RED PATH SUMMARY

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F AND RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% |
 [25% adverse CNMT] AND total feedwater flow
 less than 200 gpm
- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

EOP:

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FOLDOUT PAGE

1. LOSS OF SW_CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
- 2. <u>SI REINITIATION CRITERIA</u>

<u>IF EITHER</u> condition listed below occurs, <u>THEN</u> manually start SI pumps as necessary:

- RCS subcooling based on core exit TCs LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING
- o PRZR level CHARGING CAN NOT CONTROL LEVEL GREATER THAN 10% [30% adverse CNMT]
- 3. <u>SATURATED RECOVERY CRITERIA</u>

<u>IF</u> ruptured S/G narrow range level increases to greater than 90% [80% adverse CNMT], <u>THEN</u> consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED.

4. <u>SECONDARY_INTEGRITY_CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

5. COLD_LEG RECIRCULATION SWITCHOVER CRITERION

<u>IF</u> RWST level decreases to less than 28%, <u>THEN</u> go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

6. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS)

EOP:	TITLE:	
ECA-3.2		SGI

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man RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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ECA-3.2	SGTR WITH LOSS OF REACTOR COOLANT -	REV: 28
ECA-3.2	SATURATED RECOVERY DESIRED	PAGE 2 of 27

- A. PURPOSE This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS.
- B. ENTRY CONDITIONS/SYMPTOMS

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- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT SUBCOOLED RECOVERY DESIRED, when RWST level is low without a corresponding increase in containment sump level.
 - b. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT -SUBCOOLED RECOVERY DESIRED, when the ruptured S/G level is high and plant staff selects saturated recovery method.

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	1	SGTR WITH LOSS OF REACTOR COOLANT -		.0
ECA-3.2		SATURATED RECOVERY DESIRED	PAGE 3	२ ,

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STEP	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
· · · · ·	
	CAUTION
	TERS SHOULD NOT BE ENERGIZED UNTIL PRZR WATER LEVEL INDICATES GREATER IMUM RECOMMENDED BY TSC TO ENSURE HEATERS ARE COVERED.
* * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : 0	Steps 1 through 15 of ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, should be performed before continuing with this procedure.
o	FOLDOUT page should be open and monitored periodically.
o	Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10 ⁺⁰⁵ R/hr.
Neces o Re SF	Makeup To RWST As ssary: fer to ATT-18.0. ATTACHMENT P-RWST (~ 400 gpm can be pected)
	- OR -
WA	fer to S-3.2D. TRANSFERRING TER FROM CVCS HUT(S) TO RWST SFP (~ 60 gpm can be expected)
	-OR-
	fer to S-9J. BLENDING TO RWST 50 gpm can be expected)

EOP:	
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SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED

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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
	<u>CAUTION</u>
	IF ANY RUPTURED S/G IS FAULTED, FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.
	* * * * * * * * * * * * * * * * * * * *
İ	2 Check Ruptured S/G Level:
	a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, <u>THEN</u> perform the following:
	1) Maintain feed flow to ruptured S/G until level greater than 7% [25% adverse CNMT].
	2) Continue with Step 3. <u>WHEN</u> ruptured S/G level greater than 7% [25% adverse CNMT]. <u>THEN</u> do Steps 2b through e.
	 b. Close MDAFW pump discharge valve b. Dispatch AO to locally close to ruptured S/G valve.
	• S/G A. MOV-400/ • S/G B. MOV-4008
	c. Pull stop MDAFW pump for ruptured S/G
	d. Close TDAFW pump flow control valve to ruptured S/G manual feedwater isolation valve
	 S/G A. AOV-4297 to ruptured S/G. S/G B. AOV-4298
	 S/G A. V-4005 S/G B. V-4006
	e. Verify MDAFW pump crossile e. Manually close valves. valves - CLOSED
	 MOV-4000A MOV-4000B
/	

EOP:	
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTIO</u>	<u>N</u>
 IF OFFSITE POWER IS LOST AFTER SI RES REQUIRED TO RESTART SAFEGUARDS EQUIPM LOSS OF OFFSITE POWER) 	-
 RCS PRESSURE SHOULD BE MONITORED. IF UNCONTROLLED MANNER TO LESS THAN 250 THE RHR PUMPS MUST BE MANUALLY RESTAR 	PSIG [465 PSIG ADVERSE CNMT], THEN
* * * * * * * * * * * * * * * * * * * *	
* 3 Monitor If RHR Pumps Should Be Stopped:	
a. RHR pumps - ANY RUNNING IN INJECTION MODE	a. Go to Step 4.
b. Check RCS pressure:	b. Go to Step 4.
1) Pressure – GREATER THAN 250 psig [465 psig adverse CNMT]	
2) RCS pressure - STABLE OR INCREASING	
c. Stop RHR pumps and place in AUTO	
<pre>4 Check If S/G Secondary Side Is Intact;</pre>	<u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized. <u>THEN</u>
o Pressure in both S/Gs - STABLE OR INCREASING	verify faulted S/G isolated unless needed for RCS cooldown:
o Pressure in both S/Gs - GREATER THAN 110 PSIG	SteamlinesFeedlines
	<u>IF NOT. THEN</u> go to E-2. FAULTED STEAM GENERATOR ISOLATION. Step 1.

EOP	•		
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SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: TDA	FW pump flow control AOVs may o	drift open on loss of IA.
* 5 Monit	or Intact S/G Level:	
	row range level - GREATER N 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
nar	trol feed flow to maintain row range level between 17% % adverse CNMT] and 50%	b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner. <u>THEN</u> consider isolating unnecessary release paths:
		 TDAFW pump steam supply valves S/G blowdown valves Refer to ATT-16.0. ATTACHMENT RUPTURED S/G
	tdown margin should be monitore -2.0, FIGURE SDM.	ed during RCS cooldown. Refer to
6 Initi Shutd	ate RCS Couldown To Cold	
a. Est rat	abligh and maintain cooldown e in RCS cold legg - LESS N 100°F/HF	
a. Est rat THA	e in RCS cold legs - LESS	
a. Est rat THA b. Use c. Dum	e in RCS cold legs LESS N 100°F/HF	Manually or locally dump steam using intact S/G ARV.
a. Est rat THA b. Use c. Dum	e in RCS cold legs - LESS N 100°F/HE RHR system if in service p steam to condenser from	
a. Est rat THA b. Use c. Dum	e in RCS cold legs - LESS N 100°F/HE RHR system if in service p steam to condenser from	ucing intact S/G ARV. <u>lF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u>
a. Est rat THA b. Use c. Dum	e in RCS cold legs - LESS N 100°F/HE RHR system if in service p steam to condenser from	using intact S/G ARV. <u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> perform the following:

·	
ECA-3.2 SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 28 PAGE 7 of 2
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTA 7 Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 0° F USING FIG-1.0, FIGURE MIN SUBCOOLING Go to Step 18.	INED
8 Check Safeguards Pump Status Go to Step 14. o SI pumps - ANY RUNNING -OR-	
o RHR pumps - ANY RUNNING IN INJECTION MODE	
CAUTION	* * * * * * * * * *
THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL	
<u>NOTE</u> : o lf auxiliary spray is in use, spray flow may be incre closing normal charging valve AOV-294 and normal PRZI	
o When using PRZR PORV, select one with an operable blo	ock valve.
9 Depressurize RCS To Refill PRZR:	
a. Use normal PETE spray valve associated with running RCP • PCV-431A for A RCP • PCV-431B for B RCP • PCV-431B for B RCP • PCV-431B for B RCP • PCV-431B for B RCP	refer to HMENT N2 PORVS. lable, <u>THEN</u> use
b. PRZR level - GREATER THAN 20% b. Continue with St [40% adverge CNMT] level greater th	

adverse CNMT], THEN stop RCS

depressurization.

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c. Stop RCS depressurization

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * 1	CAUTI	• • • • • • • • • • • • • • • • • • •
	IF RCP SEAL COOLING HAD PREVIOUSLY B NOT BE STARTED PRIOR TO A STATUS EVA	EEN LOST. THEN THE AFFECTED RCP SHOULD LUATION.
	NADVERTENT CRITICALITY MAY OCCUR FO F THE RCP IN THE RUPTURED LOOP IS S	LLOWING NATURAL CIRCULATION COOLDOWN TARTED FIRST.
* * *		* * * * * * * * * * * * * * * * * * * *
	heck If An RCP Should Be tarted:	
٤	a. Both RCPs – STOPPED	a. Stop all but one RCP and go to Step 11.
E	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	b. Go to Step 18.
c	. PRZR level – GREATER THAN 20% [40% adverse CNMT]	c. Return to Step 9.
ć	. Try to start an RCP	
	 Establish conditions for starting an RCP 	
	o Bus 11A or 11B energized	•
	o Refer to ATT-15.0. ATTACHMENT RCP START	
	2) Start one RCP	

EOP:	
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STEP ACTION/	EXPECTED RESPONSE	R	ESPONSE NOT OBTAINED
11 Check If On Pumps Shoul	e Of Three SI d Be Stopped:		
a. Three SI p	umps - RUNNING	a.	Go to Step 12.
exit T/Cs [10°F adve	ling based on core - GREATER THAN 10°F rse CNMT] USING IGURE MIN SUBCOOLING	Ъ.	<u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 18.
			<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 11c. <u>IF</u> no RHR pump can be started in injection mode. <u>THEN</u> go to Step 18.
	level – GREATER THAN dverse CNMT]	c.	Do <u>NOT</u> stop SI pump. Return to Step 9.
d. Stop one S	l pump		

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Check If One Of Two SI Pumps Should Be Stopped:	
a. Two SI pumps - RUNNING	a. Go to Step 13.
 b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [35°F adverse CNMT] USING FIG-1.0, FIGURE MIN SUBCOOLING 	b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service. <u>THEN</u> go to Step 18.
-	<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT]. <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 12c. <u>IF</u> no RHR pump can be started in injection mode. <u>THEN</u> go to Step 18.
c. PRZR level · GREATER THAN 20% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 9.
d. Stop one Sl pump	

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Check If Las Be Stopped:	t SI Pump Should	
a. One SI pump	- RUNNING	a. <u>IF</u> any RHR pump running in injection mode. <u>THEN</u> go to Step 18. <u>IF NOT, THEN</u> go to Step 14.
b. Determine r subcooling		
Charging Pump Availability	RCS Subcooling C	Criteria
NONE	Insufficient subco to stop SI pump.	poling
ONE	215°F [215°F adver	se CNMT]
TWO	150°F [150°F adver	se CNMT]
THREE	80°F [80°F advers	se CNMT]
	ing based on core GREATER THAN VALUE ABOVE USING FIG-1.0. SUBCOOLING	
		<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT]. <u>THEN</u> ensure at least one RHR pump running in injection mode and to Step 13d. <u>IF</u> no RHR pump be started in injection mode. <u>THEN</u> go to Step 18.
	- GREATER THAN 20% e CNMT]	d. Do <u>NOT</u> stop SI pump. Return Step 9.

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14 Check If Charging Flow Should Be Controlled To Maintain RCS Inventory:	1 5
a. Check RHR pumps - RUNNING IN	a. Perform the following:
INJECTION MODE	 Control charging flow to maintain RCS inventory:
	o RVLIS level (no RCPs) - BETWEEN 77% <u>AND</u> 82% [82% <u>AND</u> 85% adverse CNMT]
	- OR -
	o RVLIS fluid fraction (any RCP running) - BETWEEN 84% <u>AND</u> 90%
	2) Go to Step 15.
b. Go to Step 18	
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STEP	╵┣┥	ACTION/EXPECTED RES	SPONSE	RF	SPONSE NOT OBTAINED
* *	* * *	* * * * * * * * *	CAUTIC	• • • •	* * * * * * * * * * * * * * * * * *
		P SEAL COOLING HAD E STARTED PRIOR TO			T, THEN THE AFFECTED RCP SHOULD
		ERTENT CRITICALITY E RCP IN THE RUPTUR			NATURAL CIRCULATION COOLDOWN FIRST.
* *	* * *	* * * * * * * * * *	* * * * * * *		* * * * * * * * * * * * * * * *
15 (Check	RCP Status			
	a. Boi	th RCPs - STOPPED			Stop all but one RCP and go to Step 16.
	b. Ch∉ ≥ 9	eck RVLIS level (no 95%	RCPs) -		<u>IF</u> RVLIS level (no RCPs) less than 95%. <u>THEN</u> perform the following:
					o Increase PRZR level to greater than 65% [82% adverse CNMT]
					o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING
					 <u>WHEN</u> PRZR level indicates greater than minimum recommended by the TSC. <u>THEN</u> energize PRZR heaters as necessary to saturate PRZR water
					<u>IF</u> conditions <u>NOT</u> met, <u>THEN</u> continue with Step 16. <u>WHEN</u> conditions met, <u>THEN</u> do Steps 15c and d.

This Step continued on the next page.

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STEP		ACTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED	
	(St	ep 15 continued from previous	page)		
	. E	stablish conditions for tarting an RCP:		 <u>IF</u> conditions can <u>NOT</u> be met, <u>THEN</u> perform the following: 1) Verify natural circulation 	
	-	energized. Refer to ATT-15.0, ATTACHMEN RCP START.	Т	(Refer to ATT-13.0, ATTACHMENT NC) <u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u>	
d d	¢.	tart one RCP	ć	increase dumping steam. 2) Go to Step 16. 1. <u>IF</u> an RCP can <u>NOT</u> be started.	
u u	. 0		· · ·	<u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).	
				<u>IF</u> natural circulation can <u>NOT</u> be verified. <u>THEN</u> increase dumping steam.	
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- STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***	CAUTION	* * * * * * * * * * * * * * * * * * * *
	THE UPPER HEAD REGION MAY VOID DURING RUNNING. THIS WILL RESULT IN A RAPIDL	
	IF SI HAS BEEN TERMINATED. THE ACCUMS DEPRESSURIZING THE RCS TO LESS THAN 10	
* * *		
<u>NOTE</u> :		ray flow may be increased by V-294 and normal PRZR spray valves.
	o When using PRZR PORV, select one	with an operable block valve.
	epressurize RCS To Saturation At Core Exit:	
6	a. Determine saturation pressure for core exit T/Cs using FIG-8.0, FIGURE TSAT	
ł	b. Use normal PRZR spray valves associated with running RCP	b. Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
	 PCV-431A for A RCP PCV-431B for B RCP 	<u>IF</u> PORV <u>NOT</u> available, <u>THEN</u> use auxiliary spray valve (AOV-296).
	c. <u>WHEN</u> PRZR level indicates greater than minimum recommended by the TSC. <u>THEN</u> energize PRZR heaters as necessary	
c	 Depressurize RCS until EITHER of the following conditions satisfied: 	·
	o PRZR level - GREATER THAN 75% [65% adverce CNMT]	
	- OR -	
	o RCS pressure - AT SATURATION FROM STEP 16a	

SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED

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STEP ACTION/EXPECTED RESI	PONSE RESPONSE NOT OBTAINED
17 Verify Adequate Shutdo Margin	own
a. Direct RP to sample RC ruptured S/G for boron concentration	
b. Verify boron concentra GREATER THAN REQUIREME FIG-2.0, FIGURE SDM	
18 Monitor SI Reinitiatio Criteria:	on
a. Core exit T/Cc · STABL DECREASING	E OR a. Manually start SI pumps as necessary.
b. Check RVLIS indication	b. Manually start SI pumps as necessary.
o Level (no RCPs) - G THAN 77% [82% edver	REATER
- OR	
o Fluid Fraction (any running) · GREATER	

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EOP:	
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Isolated: a. RCS subcooling based on core	a. <u>IF</u> both RCS hot leg temperatures
exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	less than 400°F, <u>THEN</u> go to Step 19c.
	<u>IF NOT. THEN</u> go to Step 20.
b. PRZR level – GREATER THAN 10% [30% adverse CNMT]	b. Return to Step 9.
c. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
d. Close SI ACCUM discharge valves	d. Vent any unisolated ACCUMs:
MOV-841MOV-865	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A, AOV-834A ACCUM B, AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC for contingency actions.
e. Locally reopen breakers for MOV-841 and MOV-865	

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	ck If Emergency D/Gs uld Be Stopped:	
	Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power . (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	o Emergency D/G output breakers - OPEN	
	o AC emergency bus voltage - GREATER THAN 420 VOLTS	
	o AC emergency bus normal feed breakers – CLOSED	
	Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	
	imize Secondary System tamination:	
	Isolate reject from hotwell to CST:	a. <u>IF</u> hotwell level increasing. <u>THEN</u> direct RP to sample hotwells for activity.
	o Place hotwell level controller (HC·10/) in MANUAL at 50%	notwellb for activity.
	o Verify hotwell level STABLE	
:	Verify local actions to complete isolation of ruptured S/G (Reter to ATT-16.0. ATTACHMENT RUPTURED S/G)	

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22 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	3) Go to Step 23.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV 4/34 MOV-4616 and MOV 4/35 	
	· ·
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(Step 22 contin	ued from previous pa	1 age)	
c. Verify CNMT R annunciator C TEMPERATURE A		1) De	rm the following: termine required SW flow to W HXs per table:
	SW DISCHARGE ALIGNMENT	CCW HXS IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30–33" d/p across each HX
	Alternate	1	95–100" d/p across in-service HX
			rect AO to adjust SW flow required value.
		o	<u>IF</u> on normal SW discharge:
			 V-4619, CCW Hx A V-4620, CCW Hx B
			- OR -
		o	<u>IF</u> on alternate SW discharge:
			• V-4619C. CCW Hx A • V-4620B. CCW Hx B

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
		······
23 Che	ck RCP Cooling	Establish normal cooling to RCPs
·a. (Check CCW to RCPs	(Refer to ATT-15.2, ATTACHMENT SEAL COOLING).
c	Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
c	Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
Ъ. С	Check RCP seal injection	
c	D Labyrinth seal D/Ps – GREATER THAN 15 INCHES OF WATER	
	- OR -	
c	RCP seal injection flow to each RCP - GREATER THAN 6 GPM	

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4 Check If Seal Return Flow Should Be Established:	
a. Verify instrument bus D -	a. Perform the following:
ENERGIZED	 Ensure steam dump mode control in MANUAL.
	 Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b. Verify RCP #1 seal cutlet temperature - LESS THAN 235°F	b. Go to Step 25.
c. Verify RCP seal outlet valves - OPEN	c. Manually open valves as necessary.
 AOV-270A AOV-270B 	
d. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e. Open RCP seal return isolation valve MOV-313	e. Perform the following:
	1) Place MOV-313 switch to OPEN.
	 Dispatch AO to locally open MOV-313.
f. Verify RCP #1 ceal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following:
	1) Trip the affected RCP
	2) Allow 4 minutes for pump coast down. <u>THEN</u> close the affected RCP seal discharge valve
	 RCP A. AOV-270A RCP B. AOV-270B
	<u>IF</u> both RCP seal discharge valves are shut. <u>THEN</u> go to Step 25.
g. Verify RCP #1 cerl leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1. RCP SEAL MALFUNCTION.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE:	Adverse CNMT conditions or loss of failure of NIS detectors.	forced air cooling may result in
	eck If Source Range tectors Should Be Energized:	
а.	Source range channels – DEENERGIZED	a. Go to Step 25e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN	b. Perform the following:
	10-10 AMPS	 <u>IF</u> neither intermediate rang channel is decreasing, <u>THEN</u> initiate boration.
		2) Continue with Step 26. <u>WHEN</u> flux is LESS THAN 10 ⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 25c, d and e.
c.	Check the following:	c. Continue with Step 26. WHEN
	o Both intermediate range channels - LESS THAN 10-10 AMPS	either condition met. <u>THEN</u> do Steps 25d and e.
	- OR -	
	o Greater than 20 minutes since reactor trip	· .
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (of 2).
		<u>IF</u> source ranges can <u>NOT</u> be restored. <u>THEN</u> refer to ER-NIS.1, SR MALEUNCTION and go to Step 26.
е.	Transfer Rk-45 recorder to one source range and one intermediate range channel	

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TITLE:

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Alignmen	h Normal Shutdown t:		
a. Check	condenser – AVAILABLE		atch AO to perform ATT-17.1. CHMENT SD-2.
b. Perfor	m the following:		
o Ope	n generator disconnects		
	G13A71 X13A73		
o Pla	ce voltage regulator to OFF		
o Ope	n turbine drain valves		
	ate reheater steam supply troller cam to close valves		
	ce reheater dump valve tches to HAND		
o Sto pum	p all but one condensate P		
c. Verify	adequate Rx head cooling:		
	ify at least one control shroud fan RUNNING		anually start one fan as ower supply permits (45 kw)
	ify one Ex compartment ling fan - EUNNING	2) Pe	erform the following:
		O	Dispatch AO to reset UV relays at MCC C and MCC D.
		o	Manually start one fan as power supply permits (23 kw).

EOP:	
ECA-3.2	

SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTIO</u> FEED FLOW SHOULD NOT BE ESTABLISHED TO A UNLESS IT IS NEEDED FOR RCS COOLDOWN.	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *
*27 Monitor Ruptured S/G(s) Narrow Range Level - GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.
	<u>IF</u> either of the following conditions occurs. <u>THEN</u> stop feed flow to ruptured S/G unless needed for RCS cooldown:
	o Ruptured S/G pressure decreases in an uncontrolled manner.
	-OR-
	o Ruptured S/G pressure increases to 1020 psig.
*28 Monitor RCP Operation:	
a. RCPs ANY RUNNING	a. Go to Step 29.
b. Check the following	b. Stop the affected RCP(s).
 RCP #1 dem1 b(f) GREATEF THAN 220 PC11; 	
o Check RCP ceal leakage WITHIN THE NORMAL OPERATING RANGE OF FIG 4.0, FIGURE RCF SEAL LEAKOFF	

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EOP:	

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SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED

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 29 Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG 30 Check If RHR Normal Cooling Can Be Established: a. RCS cold leg temperature - LESS THAN 350°F b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNNT] c. Place letdown pressure controller in MANUAL CLOSED d. Check following valves - OPEN AOV-371. letdown isolation valve AOV-371. letdown orifice valve (AOV-2006, AOV-200B, or AOV-202) c. Verify pressure on Pl-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling dto dto erablished using ATT-14.1. ATTACHMENT RHR COOL 	STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 a. RCS cold leg temperature - LESS THAN 350°F b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] c. Place letdown pressure controller in MANUAL CLOSED d. Check following valves - OPEN d. Perform the following: 1) Reset both trains of XY relays for AOV-371 and AOV-427, loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) e. Verify pressure on PI-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0.7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) e. Consult TSC to determine if RHR normal cooling should be e-tablished using ATT-14.1. 	Ava:	ilable - CONDENSER VACUUM	
 THAN 350°F b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] c. Place letdown pressure controller in MANUAL CLOSED d. Check following valves - OPEN d. Perform the following: AOV-371, letdown isolation valve AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) e. Verify pressure on P1-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0.7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be e-stablished using ATT-14.1. 			
 400 psig [300 psig adverse CNMT] c. Place letdown pressure controller in MANUAL CLOSED d. Check following valves - OPEN d. Perform the following: AOV-371. letdown isolation valve AOV-427. loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A. AOV-200B. or AOV-202) e. Verify pressure on PI-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1. 			a. Go to Step 31.
 controller in MANUAL CLOSED d. Check following valves - OPEN AOV-371. letdown isolation valve AOV-427. loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A. AOV-200B. or AOV-202) e. Verify pressure on PI-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0.7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1. d. Perform the following: l) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve. e. Go to Step 31. 			b. Go to Step 31.
 AOV-371. letdown isolation valve AOV-427. loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A. AOV-200B. or AOV-202) e. Verify pressure on PI-135 - LESS THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling chould be established using ATT-14.1. 			
 valve AOV-427. loop B cold leg to REGEN Hx At least one letdown orifice valve (AOV-200A. AOV-200B. or AOV-202) Corrify pressure on PI-135 - LESS THAN 400 PSIG Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) Consult TSC to determine if RHR normal cooling should be established using ATT-14.1. 	d. C	Check following valves - OPEN	d. Perform the following:
 At least one letdown orifice valve (AOV-200A. AOV-200B. or AOV-202) 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve. e. Verify pressure on PI-135 - LESS THAN 400 PSIG e. Go to Step 31. f. Place RCS overpressure protection system in service (Refer to 0.7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1. 		valve AOV-427, loop B cold leg to	relays for AOV-371 and
THAN 400 PSIG f. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1.	•	At least one letdown orifice valve (AOV-200A, AOV-200B, or	3) Open one letdown orifice
protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1.			e. Go to Step 31.
normal cooling should be established using ATT-14.1.	9 (C	Protection system in service Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL	
	r	ormal cooling should be stablished using ATT-14.1.	

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SGTR WITH LOSS OF REACTOR COOLANT -SATURATED RECOVERY DESIRED .

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 31. 31 Check CNMT Hydrogen Concentration: a. Direct RP to start CNMT hydrogen monitors as necessary b. Hydrogen concentration - LESS b. Consult TSC to determine if hydrogen recombiners should be placed in service. 32 Check Core Exit T/Cs - LESS Return to Step 3. THAN 200°F 33 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC 	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Concentration: a. Direct RP to start CNMT hydrogen monitors as necessary b. Hydrogen concentration - LESS THAN 0.5% b. Consult TSC to determine if hydrogen recombiners should be placed in service. 32 Check Core Exit T/Cs - LESS THAN 200° F 33 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC		nued while obtaining CNMT hydrogen
 monitors as necessary b. Hydrogen concentration - LESS THAN 0.5% b. Consult TSC to determine if hydrogen recombiners should be placed in service. 32 Check Core Exit T/Cs - LESS THAN 200°F 33 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC 		
THAN 0.5% hydrogen recombiners should be placed in service. 32 Check Core Exit T/Cs - LESS Return to Step 3. THAN 200°F 33 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC		en
THAN 200°F 33 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC		hydrogen recombiners should be
Status: a. Maintain cold shutdown conditions b. Consult TSC		Return to Step 3.
b. Consult TSC		
	a. Maintain cold shutdown conditio	ons
- END -	b. Consult TSC	
		- END -
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ECA-3.2 APPENDIX LIST

<u>TITLE</u>

TITLE:

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE TSAT (FIG-8.0)
- 5) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 6) ATTACHMENT SFP-RWST (ATT-18.0)
- 7) ATTACHMENT N2 PORVS (ATT-12.0)
- 8) ATTACHMENT NC (ATT-13.0)
- 9) ATTACHMENT SEAL COOLING (ATT-15.2)
- 10) ATTACHMENT RCP START (ATT-15.0)
- 11) ATTACHMENT D/G STOP (ATT-8.1)
- 12) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 13) ATTACHMENT SD-1 (ATT 1/.0)
- 14) ATTACHMENT SD-2 (ATT 17.1)
- 15) ATTACHMENT RHR COOL (ATT 14.1)
- 16) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-B.5)
- 18) FOLDOUT

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RED PATH_SUMMARY

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F AND RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% |
 [25% adverse CNMT] AND total feedwater flow
 less than 200 gpm
- e. CONTAINMENT CNMT pressure greater than 60 psig

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EOP:

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1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbuttor.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI_REINITIATION CRITERIA</u>

<u>IF EITHER</u> condition listed below occurs, <u>THEN</u> manually start SI pumps as necessary:

o Core exit T/Cs - INCREASING

-OR-

o Check RVLIS indication:

Level (no RCPs) - LESS THAN 77% [82% adverse CNMT]

Fluid :raction (any RCP running) - LESS THAN 84%

3. SECONDARY INTEGRITY CRITERIA

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized, and has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. COLD LEG RECIECULATION SWITCHOVER CRITERION

<u>IF</u> RWST level decreases to less than 28%, <u>THEN</u> go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

5. AFW SUPPLY SWITCHOVER CRITEFION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

TITLE: EOP: REV: 31 SGTR WITHOUT PRESSURIZER PRESSURE CONTROL ECA-3.3 PAGE 1 of 30

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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- A. PURPOSE This procedure provides actions for a SGTR with coincident loss of normal and auxiliary PRZR sprays and PORVs.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-3, STEAM GENERATOR TUBE RUPTURE, when PRZR pressure control is not available.

ECA-3.3 SGTR WITHOUT PRESSURIZER			
	PAGE 3 of 3		
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED		
<u>NOTE</u> : o Foldout page should be open AND	monitored periodically.		
o Adverse CNMT values should be us greater than 4 psig or CNMT radi	ed whenever CNMT pressure is ation is greater than 10 ⁺⁰⁵ R/hr.		
1 Check Ruptured S/G Narrow Range Level - LESS THAN 85% [65% adverse CNMT]	Go to Step 8.		
2 Check RCP Status - AT LEAST ONE RUNNING	Try to start one RCP:		
	a. Establish conditions for starting RCP.		
	o Bus 11A and Bus 11B energized		
	o Refer to ATT-15.0. ATTACHMENT RCP START		
	b. Start one RCP. <u>IF</u> no RCP can be started, <u>THEN</u> go to Step 4.		
3 Check IF Normal PRZR Spray Available:			
a. Verify the following:	a. Perform the following:		
 Verify IA to CNMT - AVAILABLE Verify spray valve associated 	 Place PRZR proportional heaters in PULL STOP. 		
with running RCP - OPERABLE	2) Place PRZR backup heaters to OFF.		
	3) Place normal spray valve controllers to MANUAL at 0%.		
	4) Go to Step 4.		
b. Go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 21			

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ECA-3.3 SGTR WITHOUT PRESSURIZER	PRESSURE CONTROL PAGE 4 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Try To Restore PRZR PORV:	
a. Block valves – AT LEAST ONE OPEN	a. Open one block valve unless it was closed to isolate an open
 MOV-516 for PCV-430 MOV-515 for PCV-431C 	PORV.
	If block valves can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally ensure breakers to block valves closed.
	 MOV-515. MCC D position 6C MOV-516. MCC C position 6C
b. Check IA to CNMT - AVAILABLE	b. Refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORVs.
c. Verify at least one PRZR PORV flow path - AVAILABLE	c. Go to Step 5.
d. Go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 22	
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	ECA-3.3 SGTR WITHOUT PRESSURIZER	PRESSURE CONTROL	REV: 31
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			7
	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
	<u>NOTE</u> : If auxiliary spray is the only means the 320°F ∆T limit between the spray		
	5 Try To Establish Auxiliary Spray:		
	a. Charging pumps – AT LEAST ONE RUNNING	a. Perform the following	ng:
		1) <u>IF</u> CCW flow is le RCP thermal barr: RCP #1 seal outle temperature offse <u>THEN</u> locally iso injection to affe	ier <u>OR</u> any et cale high. late seal
		• RCP A, V-300A • RCP B, V-300B	
		2) Ensure HCV-142 de	emand at 0%.
/		 Start charging parts necessary. 	umps as
		<u>IF</u> charging not a <u>THEN</u> go to Step (
	b. Establish auxiliary spray flow: 1) Open auxiliary spray valve (AOV-296)	b. <u>IF</u> auxiliary spray o established. <u>THEN</u> go	
	2) Close charging valve to loop B cold leg (AOV-294)		
	c. Go to E-3. STEAM GENERATOR TUBE RUPTURE. Step 21b		
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: TDAFW pump flow control AOVs may	drift open on loss of IA.
* 6 Monitor Intact S/G Level:	
a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. <u>IF</u> narrow range level in intact S/G continues to increase in an uncontrolled manner. <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
7 Check PRZR Level - GREATER THAN 10% [30% adverse CNMT]	Return to Step 1.

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	-3.3 SGTR WITHOUT PRESSURIZ	ER PRESSURE CONTROL REV: 31 PAGE 7 of 30
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STER	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 (Check If SI Can Be Terminated:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Secondary heat sink: o Total feed flow to intact S/Gs - GREATER THAN 200 GPM AVAILABLE	b. <u>IF</u> neither condition satisfied, <u>THEN</u> do <u>NOT</u> stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.
	-OR- o Narrow range level in intact S/G - GREATER THAN 7% [25% adverse CNMT]	
	c. RVLIS indication o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]	c. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	-OF o Fluid fraction (any RCP running) - GREATER THAN 84%	
	d. Any ruptured S/G narrow range level - INCREACING IN AN UNCONTROLLED MANNEF OF OFFSCALE HIGH	d. Do <u>NOT</u> stop SI pumps. Return to Step 2.
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		REV: 31
. [ECA-3.3 SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	PAGE 8 of 30
\cup -	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	1.
	SIEF RESPONSE NOT OBTAINED	
	9 Stop SI Pumps and Place In AUTO	
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EOP: TITLE:	REV: 31
ECA-3.3 SGTR WITHOUT PRESSURIZER	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch A0 to close seal injection needle valve(s) to affected RCP:
	• RCP A. V-300A • RCP B. V-300B
	 Ensure HCV-142 open. demand at 0%.
b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
o LCV-112B - OPEN o LCV-112C - CLOSED	<u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
c. Start charging pumps as necessary and adjust charging flow to perform the following:	
o Restore PRZR level	
o Maintain RCS subcooling based on core exit T/Cs - GREATER THAN O°F USING FIG-1.0. FIGURE MIN SUBCOOLING	

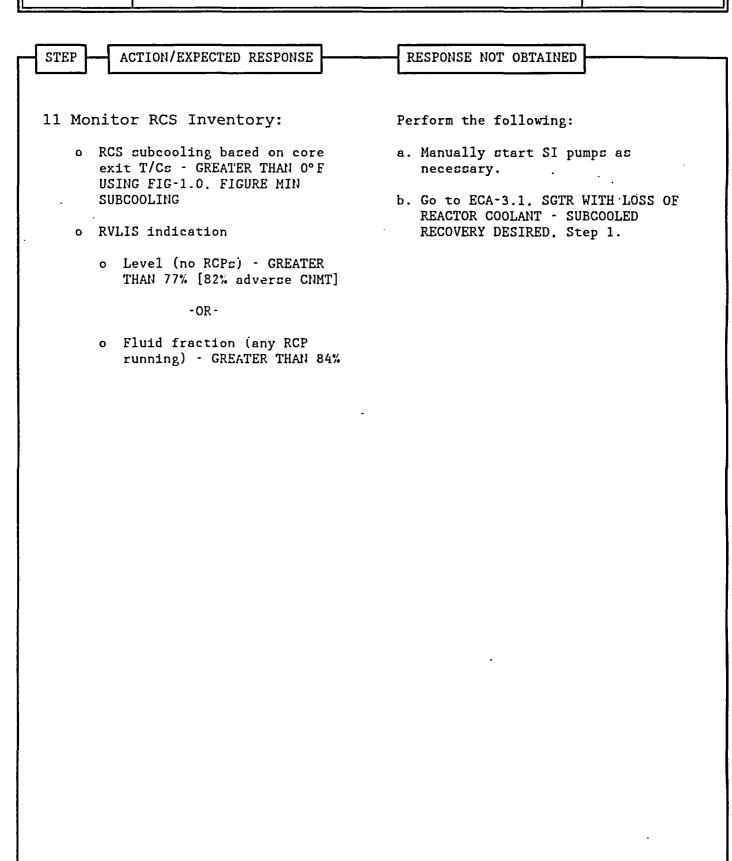
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TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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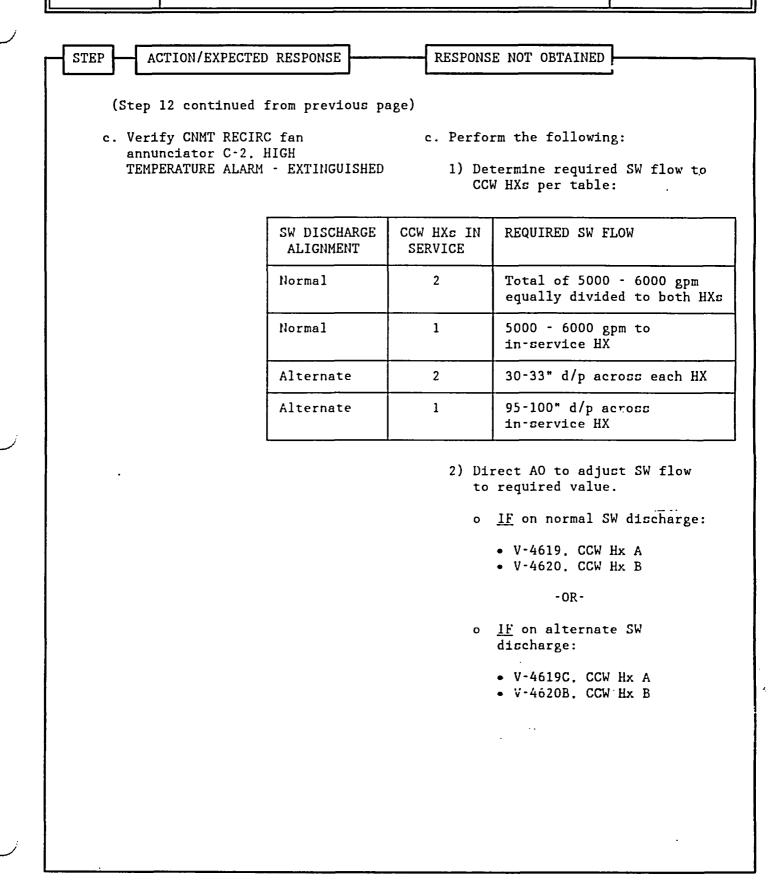
	RESPONSE NOT OBTAINED
12 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	3) Go to Step 20.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	

This Step continued on the next page.

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SGTR WITHOUT PRESSURIZER PRESSÜRE CONTROL

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3 Check If Normal CVCS Operation Can Be Established	
a. Verify IA restored:	a. Continue with Step 17. <u>WHEN</u> IA restored. <u>THEN</u> do Steps 13
o IA to CNMT (AOV-5392) - OPEN	through 16.
o IA pressure - GREATER THAN 60 PSIG	
b. Verify instrument bus D – ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:
	1) Verify MCC A energized.
	 Place instrument bus D on maintenance supply.
c. CCW pumps - ANY RUNNING	c. Perform the following:
	 <u>IF</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A. MOV-749A and MOV-759 RCP B. MOV-749B and MOV-759
	2) Manually start one CCW pump.
d. Charging pump ANY RUNNING	d. Continue with Step 20. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 14 through 17.
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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
OTE: If PRZR level is less than 13%, let AOV-427 to OPEN.	down may be established by placing
4 Establish Normal Letdown: a. Establish charging line flow to	<u>IF</u> RCP seal return has been established. <u>THEN</u> establish excess letdown as follows:
REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE:	o Place excess letdown divert valve, AOV-312, to NORMAL.
 Letdown orifice valves (AOV-200A, AOV-200B, and 	o Ensure CCW from excess letdown open, (AOV-745).
AOV-202) • AOV-371, letdown isolation valve	o Open excess letdown isolation valve AOV-310.
 AOV-427, loop B cold leg to REGEN Hx 	o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less
c. Place letdown controllers in MANUAL at 40% open	than 100 psig. o Adjust charging pump speed as
TCV-130PCV-135	necessary. <u>IF</u> RCP seal return <u>NOT</u> established.
d. Reset both trains of XY relays for AOV-371 and AOV-427	THEN consult TSC to determine if excess letdown should be placed in service.
e. Open AOV-3/1 and AOV-427	
f. Open letdown orifice valves as necessary	
g. Place PCV-135 in AUTO at 250 prig	
h. Place TCV-130 in AUTO at the normal setpoint	
i. Adjust charging pump speed and HCV-142 as necessary	

EOP: ECA-3.3

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP ACTION/EXPEC	TED RESPONSE	RESPONSE NOT OBTAINED
AUTO	id flow control co 9.5 gpm control valve in	c. Adjust controls as necessary.
d. Check VCT level o Level – GREA -OR- o Level – STAB	TER THAN 20%	 d. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. <u>IF NOT.</u> <u>THEN</u> reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL. 3) Increase RMW flow.

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EOP: TITLE: ECA-3.3 SGTR WITHOUT H

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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	ACTION/EXPECTED RESPONSE	DECRONCE NOT OPTATNED
STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17 Chec	k RCP Cooling:	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL
a. Ch	neck CCW to RCPs:	COOLING).
o	Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
o	Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
b. Ch	neck RCP seal injection:	
o	Labyrinth seal D/Ps – GREATER THAN 15 INCHES OF WATER	
	- OR -	
o	RCP seal injection flow to each RCP - GREATER THAN 6 GPM	
		·

EOP: TITLE: ECA-3.3 SGTR WITHOUT

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Check If Seal Return Flow Should Be Established:	
a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 19.
b. Verify RCP seal outlet valves - OPEN	b. Manually open valves as necessary.
 AOV-270A AOV-270B 	
c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
d. Open RCP seal return isolation valve MOV-313	d. Perform the following:
	1) Place MOV-313 switch to OPEN.
	2) Dispatch AO to locally open MOV-313.
e. Verify RCP #1 deal leakoff flow - LESS THAN p.0 GPM	e. Perform the following:
	1) Trip the affected RCP
	2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve
,	 RCP A. AOV-270A RCP B. AOV-270B
	<u>lF</u> both RCP seal discharge valves are shut. <u>THEN</u> go to Step 19.
f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	 Refer to AP-RCP.1. RCP SEAL MALFUNCTION.

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ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19 Equalize Charging And Letdown Flows: a. Verify charging pump controllers	
in manual	· · ·
b. Control charging and seal injection flows to equal letdown and seal leakoff flows	
20 Check If Emergency D/Gs Should Be Stopped:	
a. Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).
o Emergency U/G output breakers - OPEN	
o AC emergency bus voltage - GREATER THAN 420 VOLTS	
o AC emergency bus normal feed breakers CLOSED	
b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

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ECA-3.3	SGTR	WITHOUT	PRESSURIZER	PRESSURE	CONTROL

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EOP:

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21 N	finimize Secondary System	
C	Contamination:	
ł	a. Isolate reject from hotwell to CST:	a. <u>IF</u> hotwell level increasing, <u>THEN</u> direct RP to sample hotwells for activity.
	o Place hotwell level controlíer (HC-107) in MANUAL at 50%	notwells for activity.
	o Verify hotwell level - STABLE	
1	b. Verify local actions to complete isolation of ruptured S/G (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G)	
		-

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP ACTION/EX	PECTED RESPONSE	RESPONSE NOT OBTAINED
	conditions or loss IS detectors.	of forced air cooling may result in
22 Check If Sour Detectors Sho	ce Range ould Be Energized	:
a. Source range DEENERGIZED	channels -	a. Go to Step 22e.
	ediate range flux - EL LESS THAN	b. Perform the following:
10-10 AMPS		1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration.
		2) Continue with Step 23. <u>WHEN</u> flux is LESS THAN 10 ⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 22c through e.
c. Check the fo	llowing:	c. Continue with Step 23. <u>WHEN</u> either condition met. <u>THEN</u> do
	rmediate range - LESS THAN S	Steps 22d and e.
-	OR-	
o Greater t reactor t	han 20 minutes since rip	2
d. Verify sourc ENERGIZED	e range detectors ·	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).
		<u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 22.
cource range	45 recorder to one and one range channel	

	TINE:		REV: 31
ECA-3.3	SGTR WITHOUT PRESSURIZER	R PRESSURE CONTROL	PAGE 22 of
			<u>.</u>
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
		L	
00 Detabl	ish Normal Shutdown		
Alignm			
a. Chec	k condenser – AVAILABLE	a. Dispatch AO to perf ATTACHMENT SD-2.	orm ATT-17.1,
b. Perf	form the following:		• •
ο (pen generator disconnects		
	1G13A71		
•	9X13A73		
o I	lace voltage regulator to OFF		
ο (pen turbine drain valves		
	otate reheater steam supply ontroller cam to close valves		
	Place reheater dump valve witches to HAND		
	Stop all but one condensate Sump		
c. Veri	fy adequate Rx head cooling:		
	erify at least one control od shroud fan – RUNNING	 Manually start of power supply per 	
	erify one Rx compartment cooling fan RUNNING	2) Perform the foll	owing:
	ooiing fan kommo	o Dispatch AO t relays at MCC	
		o Manually star power supply (23 kw)	
	fy ATT-1/.0. ATTACHMENT SD-1 MPLETE		

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	ECP: TITLE: ECA-3.3 SGTR WITHOUT PRESSURIZER PRESSÜRE CONTROL	REV: 31
•		PAGE 23 of 30
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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	}
	<u>NOTE</u> : Plant staff should decide whether to repair PRZR pressure consistents or continue with this procedure. If PRZR pressure constablished, PRZR level should be restored to greater than 10 adverse CNMT] and then further recovery should continue with STEAM GENERATOR TUBE RUPTURE, Step 32.	ontrol is 0% [30%
	24 Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: a. Return to Step 11.	
	o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	
	o RVLIS indication	
	o Level (no RCPs - GREATER THAN 77% [82% adverse CNMT]	
	-OR-	
\bigcirc	o Fluid fraction (any RCP running) - GREATER THAN 84%	
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
	 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
	c. Close SI ACCUM discharge valves c. Vent any unisolated A	ACCUM5 :
	 MOV-841 MOV-865 MOV-865 Unisolated SI ACC 	for UMs.
	ACCUM A. AOV-83 ACCUM B. AOV-83	4A 4B
	2) Open HCV-945.	,
	<u>IF</u> an accumulator can isolated or vented. TSC for contingency a	THEN consult
	d. Locally reopen breakers for MOV-841 and MOV-865	
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EOP:	TITLE:
ECA-3.3	SGI

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: Leakage from ruptured S/G into RCS concentration.	will dilute RCS boron
25 Verify Adequate Shutdown Margin	· · · · ·
a. Direct RP to sample RCS and ruptured S/G for boron concentration	
b. Verify boron concentration - GREATER THAN REOUIREMENTS OF FIG-2.0. FIGURE SDM	b. Borate as necessary.
26 Maintain Required RCP Seal	Perform the following:
Injection Flow And Labyrinth Seal D/P:	o Adjust charging flow to REGEN Hx. HCV-142 as necessary.
o Labyrinth seal P/P to each RCP - GREATER THAN 15 INCHES OF WATER	- OR -
o. RCP seal injection flow - GREATER THAN to GPM	 Dispatch AO to adjust seal injection needle valves V-300A and V-300B if necessary.
27 Initiate RCS Cooldown to 350°F In RCS Cold Legs:	
a. Establish and maintain cooldown rate in RCS cold legs LESS THAN 100°F/HF	
b. Dump steam to condenser from intact S/G	b. Manually or locally dump steam using intact S/G ARV.
	<u>IF</u> no intact S/G available, <u>THEN</u> use faulted S/G.

	PAGE 25 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * * * * * * * * * * * * * * * * * *	
CAUTIO	<u>N</u>
RCS AND RUPTURED S/G PRESSURES MUST BE M ARV SETPOINT.	AINTAINED LESS THAN THE RUPTURED S/G
* * * * * * * * * * * * * * * * * * * *	
28 Control Charging Flow To Maintain RCS Subcooling:	
-	. In success shound no films to
a. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F	a. Increase charging flow to maintain subcooling greater than
USING FIG-1.0. FIGURE MIN SUBCOOLING	20°F using FIG-1.0, FIGURE MIN SUBCOOLING and go to Step 29.
b. Ruptured S/G narrow range level	b. Control charging flow to
- LESS THAN 90% [80% adverse CNMT]	maintain RCS pressure at ruptured S/G pressure and go to
	Step 29.
 c. Ruptured S/G narrow range level - STABLE OR DECREASING 	c. <u>IF</u> ruptured S/G level increasing. <u>THEN</u> decrease
	charging flow to stabilize level. Maintain RCS subcooling
	greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING.
29 Check If RCS Cooldown Should	
Be Stopped:	
a. RCS cold leg temperatures - LESS THAN 350°F	n. Return to Step 25.
b. Stop RCS cooldown	·

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30 Check RCS Pressure - GREATER THAN 400 PSIG [300 PSIG adverse CNMT]	Go to Step 33.
*31 Monitor Ruptured S/G Narrow Range Level - GREATER THAN	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.
17% [25% adverse CNMT]	<u>IF</u> any of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G:
	o Ruptured S/G pressure decreases in an uncontrolled manner.
	- OR -
	o Ruptured S/G pressure increases to 1020 psig.
	-OR-
	o Ruptured S/G pressure decreases to 350 psig psig <u>AND</u> ruptured S/G level greater than 7% [25% adverse CNMT]

E6*: UTRE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL REV: 31 PAGE 27 of PAGE 27 of STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED • STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. • RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT] • Perform the following: • Decrease charging and increase letdown to initiate backfill •OR- • • Initiate blowdown from ruptured S/G • • • • • • • Dump steam from ruptured S/G • • • • • • • • • • • • • • • • • • • • • • • • • • • • •<			ہ
PAGE 27 of STEP ACTION/EXPECTED RESPONSE RESPONSE RESPONSE NOT OBTAINED CAUTION • STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. • RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT] •. Perform the following: • Decrease charging and increase letdown to initiate backfill -OR- • Initiate blowdown from ruptured S/G -OR- • Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CIMT]	TITLE:		REV: 31
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED CAUTION OBT OBTAINED CAUTION CAUTION CAUTION CAUTION CAUTION STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G S/G TO 400 PSIG [300 PSIG adverse CIMT] - OR- Dump steam from ruptured S/G - OR- Dump steam from ruptured S/G Dump steam from ruptured S	ECA-3.3 SGTR WITHOUT PRESSURIZ	ER PRESSURE CONTROL	
CAUTION • STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. • RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT] •. Perform the following: • Decrease charging and increase letdown to initiate backfill •OR- • Initiate blowdown from ruptured S/G •OR- • Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CUMT]			PAGE 27 OI
CAUTION			
 STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G to 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: Decrease charging and increase letdown to initiate backfill -OR- Initiate blowdown from ruptured S/G Oump steam from ruptured S/G Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT] 	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
 STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE. RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G to 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: Decrease charging and increase letdown to initiate backfill -OR- Initiate blowdown from ruptured S/G Oump steam from ruptured S/G Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT] 			
<pre>STEAMLINE. o RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED. 32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: o Decrease charging and increase letdown to initiate backfill</pre>	<u>CAUT:</u>	ION	* * * * * * * *
<pre>32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: o Decrease charging and increase letdown to initiate backfill</pre>		RUPTURED S/G IF WATER MAY	EXIST IN ITS
<pre>S/G To 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: o Decrease charging and increase letdown to initiate backfill -OR- o Initiate blowdown from ruptured S/G -OR- o Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT]</pre>	 RUPTURED S/G PRESSURE MAY DECREASE I 	RAPIDLY WHEN STEAM IS RELEA	SED.
<pre>S/G To 400 PSIG [300 PSIG adverse CNMT] a. Perform the following:</pre>	* * * * * * * * * * * * * * * * * * * *		* * * * * * * *
<pre>S/G To 400 PSIG [300 PSIG adverse CNMT] a. Perform the following: o Decrease charging and increase letdown to initiate backfill -OR- o Initiate blowdown from ruptured S/G -OR- o Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT]</pre>			
 o Decrease charging and increase letdown to initiate backfill -OR- o Initiate blowdown from ruptured S/G -OR- o Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT] 	S/G To 400 PSIG [300 PSIG		
increase letdown to initiate backfill -OR- o Initiate blowdown from ruptured S/G -OR- o Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] b. Return to Step 31.	a. Perform the following:		
 Initiate blowdown from ruptured S/G -OR- O Dump steam from ruptured S/G Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT] 	increase letdown to initiate		
ruptured S/G -OR- o Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	- OR -		
 Dump steam from ruptured S/G b. Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT] 			
b. Check RCS pressure - LESS THAN b. Return to Step 31. 400 psig [300 psig adverse CNMT]	-OR-		
400 psig [300 psig adverse CNMT]	o Dump steam from ruptured S/G		
c. Stop RCS depressurization		b. Return to Step 31.	
	c. Stop RCS depressurization		

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EOP: TITLE: ECA-3.3 SGTR WITH

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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33 Check If RHR Normal Cooling Can Be Established:	
a. RCS cold leg temperature – LESS THAN 350°F	a. Return to Step 27.
b. RCS pressure – LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 31.
c. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service. <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
NOTE: Leakage from ruprured S/G into RCS concentration.	will dilute RCS boron
34 Verify Adequate Shutdown Margin	
a. Direct RP to cample RCS and ruptured S/G for buron concentration	
b. Verify boron concentration GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Borate as necessary.

ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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	nitiate RCS Cooldown To Cold nutdown:		
a.	. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR		
Ь.	. Use RHR system if in service		
c.	. Dump steam to condenser from intact S/G	c.	Manually or locally dump steam from intact S/G using ARVs.
			<u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> use faulted S/G.
	ontrol Charging Flow To aintain RCS Subcooling:		
а.	. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING	а.	Increase charging flow to maintain subcooling greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING and go to Step 37.
b.	. Ruptured S/G narrow range level - LESS THAN 90% [80% adverse CNMT]	b.	Control charging flow to maintain RCS pressure at ruptured S/G pressure and go to Step 37.
c.	. Ruptured S/G narrow range level - STABLE OR DECREASING	c.	<u>IF</u> ruptured S/G level increasing, <u>THEN</u> decrease charging flow to stabilize level. Maintain RCS subcooling greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING.

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	نـــــــ
*37 Monitor RCP Operation:	
a. RCPs - ANY RUNNING	a. Go to Step 39.
b. Check the following:	b. Stop the affected RCP(s).
o RCP #1 seal D/P - GREATER THAN 220 PSID	
o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	
38 Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 34.
39 Evaluate Long Term Plant Status:	
a. Maintain cold chutdown condition:	
b. Consult TSC	
· EN	[)
	· ·

TITLE:

EOP:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

ECA-3.3 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RCP START (ATT-15.0)
- 6) ATTACHMENT N2 PORVS (ATT-12.0)
- 7) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 8) ATTACHMENT D/G STOP (ATT-8.1)
- 9) ATTACHMENT SD-1 (ATT 1/.0)
- 10) ATTACHMENT SEAL COOLING (ATT-15.2)
- 11) ATTACHMENT SD-2 (ATT 17.1)
- 12) ATTACHMENT RHR COOL (ATT 14.1)
- 13) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 14) FOLDOUT

ECA-3.3 SGTR WITHOUT PRESSURIZER PRESSURE CONTR	EOP:	TIRE:
	ECA-3.3	SGTR WITHOUT PRESSURIZER PRESSURE CONTROL
RED PATH SUMMARY		

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F <u>AND</u> RVLIS level (no RCPs) less than 52% [55% adverse CNMT]

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- c. HEAT SINK Narrow range level in all S/Gs less than 7% [25% adverse CNMT] AND total feedwater flow less than 200 gpm
- e. CONTAINMENT CNMT pressure greater than 60 psig

EOP:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

PAGE 1 of 1

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
- 2. <u>SI_REINITIATION CRITERIA</u>

<u>IF EITHER</u> condition listed below occurs, <u>THEN</u> manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

 RCS subcooling based on core exit TCs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

o Check RVLIS indication:

Level (no RCPs) - LESS THAN 77% [82% adverse CNMT] Fluid Fraction (any RCP running) - LESS THAN 84%

3. SECONDARY INTEGRITY CRITERIA

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. COLD_LEG_RECIRCULATION_SWITCHOVER_CRITERION

IF RWST level decreases to less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

5. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

EOP:	TITLE:		REV:	23
ES-0.1	REACTO	R TRIP RESPONSE	PAGE	1 of 20

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

EOP:	TITLE:	REV:	23
ES-0.1	REACTOR TRIP RESPONSE	PAGE	2 of 20

- A. PURPOSE This procedure provides the necessary instructions to stabilize and control the plant following a reactor trip without a safety injection.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, when SI is neither actuated nor required.

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	ES-0.1

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TITLE:

REACTOR TRIP RESPONSE

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STEP ACTION/EXPECTED RESP	PONSE	RESPONSE NOT OBTAINED
* * * * * * * * * * * * * * *	<u>CAUTION</u>	* * * * * * * * * * * * * * * * * * * *
IF SI ACTUATION OCCURS DURING SAFETY INJECTION. SHOULD BE I		E, THEN E-O, REACTOR TRIP OR
********	* * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : o FOLDOUT page should	be open and mo	nitored periodically.
o Critical Safety Fund to Appendix 1 for Re	ction Status Tr ed Path Summary	ees should be monitored. (Refer .)
o Refer to AP(s) that	were in effect	prior to the reactor trip.
* 1 Monitor RCS Tavg - STA OR TRENDING TO 547°F		<u>IF</u> temperature less than 547°F and decreasing, <u>THEN</u> perform the following:
	•	a. Stop dumping steam.
		b. Ensure S/G blowdown and sample valves closed.
		c. Ensure reheater steam supply valves are closed.
		d. <u>IF</u> MDAFW pumps supplying greater than 200 gpm. <u>THEN</u> ensure TDAFW pump steam supply valves in PULL STOP.
		e. <u>IF</u> cooldown continues. <u>THEN</u> control total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G. <u>WHEN</u> S/G level greater than 5% in one S/G. <u>THEN</u> limit feed flow to that required to maintain S/G level.
		f. <u>IF</u> cooldown continues below 540°F, <u>THEN</u> close both MSIVs.
		<u>lF</u> temperature greater than 547°F and increasing. <u>THEN</u> dump steam to stabilize and slowly decrease temperature to 547°F.

E PAGE 4 of ENOT OBTAINED SE NOT OBTAINED rature less than 554°F. do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u> t to 0% demand.
nue with Step 3. <u>WHEN</u> rature less than 554°F. do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u>
nue with Step 3. <u>WHEN</u> rature less than 554°F. do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u>
rature less than 554°F, do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u>
rature less than 554°F, do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u>
rature less than 554°F, do Steps 2b through f. ss MANUAL pushbuttons for B MFW regulating valve and s valve controllers <u>AND</u>
B MFW regulating valve and s valve controllers <u>AND</u>
lly start both MDAFW pumps.
tal AFW flow greater than pm can <u>NOT</u> be established. perform the following:
nually start TDAFW pump.
- OR -
rform the following:
Establish MFW on by <u>pas</u> s valves.
Go to step 3.

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ES-0.1 REACTOR TRI	P RESPONSE REV: 23
	PAGE 5 of 20
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 3 Monitor S/G Levels:	
a. Narrow range level – GREATER THAN 5%	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G.
b. Control feed flow to maintain narrow range level between 17% and 52%.	b. <u>IF</u> narrow range level in any S/G continues to increase, <u>THEN</u> stop feed to that S/G.
4 Verify MRPI Indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	<u>IF</u> one or more control rods <u>NOT</u> fully inserted. <u>THEN</u> perform the following:
	a. Place RMW mode selector switch to BORATE.
	b. Adjust boric acid flow control valve. FCV-110A, for desired flowrate.
	c. Set boric acid integrator to desired amount (650 gallons for each control rod not fully inserted).
	d. Place RMW control to start and verify flow. <u>IF</u> flow can <u>NOT</u> be established. <u>THEN</u> refer to ER-CVCS.1. REACTOR MAKEUP CONTROL MALFUNCTION.
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REACTOR TRIP RESPONSE

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	 5 Verify All AC Busses - ENERGIZED BY OFFSITE POWER 9 Normal feed breakers to all 480 volt busses - CLOSED 9 480 volt bus voltage - GREATER THAN 420 VOLTS 9 Emergency D/G output breakers - OPEN 	 Perform the following: a. IF any AC emergency bus normal feed breaker open. THEN ensure associated D/G breaker closed. b. Perform the following as necessary: Ensure one CCW pump running. Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie Reset Bus 13 and Bus 15 lighting breakers. Dispatch AO to locally reset and start adequate air compressors. Place the following pumps in PULL STOP: EH pumps Turning gear oil pump HP seal oil backup pump Restore power to MCCs. A from Bus 13 E from Bus 15 F from Bus 15 Start HP seal oil backup pump Start HP seal oil backup pump Establish 2 CNMT RECIRC fans in service (205 kw each). Ensure D/G load within limits. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).
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ES-0.1 REACTOR TRIP RESPONSE PAGE 7 of STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 6 Verify At Least Two SW Pumps Manually start SW pumps as necessary. IF NO SW pumps running. THEN perform the following: a. Pull stop D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4. ATTACHMENT NO SW PUMPS IF only one SW pump running. THEN refer to AP-SW.2. LOSS OF SERVICE WATER.	EOP:		RE	V: 23
 6 Verify At Least Two SW Pumps - RUNNING Manually start SW pumps as necessary. IF NO SW pumps running. THEN perform the following: a. Pull stop D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4. ATTACHMENT NO SW PUMPS IF only one SW pump running. THEN refer to AP-SW.2. LOSS OF SERVICE 	ES-0.1	REACTOR TR.		GE 7 of
 RUNNING necessary. IF NO SW pumps running, THEN perform the following: a. Pull stop D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4. ATTACHMENT NO SW PUMPS IF only one SW pump running, THEN refer to AP-SW.2. LOSS OF SERVICE 	- STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
perform the following: a. Pull stop D/G that is <u>NOT</u> supplied by alternate cooling <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE			• • •	
supplied by alternate cooling <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE				<u>N</u>
SW PUMPS <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE			supplied by alternate co <u>AND</u> immediately depress associated VOLTAGE SHUTD	oling
refer to AP-SW.2, LOSS OF SERVICE				MENT NO
			refer to AP-SW.2, LOSS OF S	

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EOP:

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 7 Verify IA Available: Adequate air compressor(s) - RUNNING IA pressure - GREATER THAN 60 PSIG IF adequate electric air compressor(s) can MOT be operated. THEN use diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) IF IA pressure can NOT be maintained, THEN perform the following: Refer to AP-IA.1, LOSS OF INSTRUMENT AIR. Verify charging pump A NOT running and place in PULL STOP. Dispatch AO to locally open V-358, manual charging pump room). WHEN V-358 open, THEN direct AO to cloce V-268 to isolate charging pump B and C from VCT (charging pump room). 	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	o Adequate air compressor(s) - RUNNING o IA pressure - GREATER THAN	 start adequate air compressors. <u>IF</u> adequate electric air compressor(s) can <u>NOT</u> be operated. <u>THEN</u> use diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) <u>IF</u> IA pressure can <u>NOT</u> be maintained, <u>THEN</u> perform the following: a. Refer to AP-IA.1, LOSS OF INSTRUMENT AIR. b. Verify charging pump A <u>NOT</u> running and place in PULL STOP. c. Dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). d. <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT

			REV: 23
ES-0.1	REACTOR TR	IP RESPONSE	PAGE 9 of
STEP ACT	ON/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	}
8 Check PR	ZR Level Control:		
	charging pumps - ANY	a. Perform the following	ig:
RUNNIN	3	 Close letdown iso AOV-427. 	lation,
		2) Manually start or pump.	e charging
b. PRZR 1	evel - GREATER THAN 13%	b. Perform the following	ig:
		1) Place letdown isc AOV-427 switch to	
		 Verify excess let isolation valve A closed. 	
		3) Ensure PRZR heate	ers off.
		4) Control charging PRZR level greate	
		5) Continue with Ste PRZR level greate <u>THEN</u> do Steps 8c	r than 13%,
c. Verify	letdown - IN SERVICE	c. Verify excess letdow service. <u>IF NOT. TH</u> place letdown in ser to ATT-9.0, ATTACHMM	<u>IEN</u> manually vice (Refer
d. PRZR 10	evel - TRENDING TO 35%	d. Control charging and maintain PRZR level	
e. Check l	PRZR heaters – ENERGIZED	e. Reset PRZR heaters a	
o PRZI	R proportional heaters	to restore PRZR pres	sure.
	R heater backup group		

OP: TITLE: ES-0.1 REACTOR TR	IP RESPÓNSE REV: 23
ES-0.1 REACIOR IR	PAGE 10 c
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Check PRZR Pressure Control:	
a. PRZR pressure – GREATER THAN 1750 PSIG	a. Perform the following:
	 Verify SI actuation. <u>IF NOT</u>. <u>THEN</u> manually actuate SI and CI.
	2) Go to E-O. REACTOR TRIP OR SAFETY INJECTION. Step 1.
b. PRZR pressure · GREATER THAN 2210 PSIG	b. <u>IF</u> pressure less than 2210 PSIG and decreasing. <u>THEN</u> perform the following:
	1) Ensure PRZR PORVs closed.
	<u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
	 PCV-430. MOV-516 PCV-431C. MOV-515
	 Ensure normal PRZR spray valves closed.
	PCV-431APCV-431B
	<u>lF</u> valves can <u>NOT</u> be closed. <u>THEN</u> stop associated RCP(s).
	3) Ensure PRZR heaters energized
This Step continued on the next pay-	•

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EOP:		REV: 23
ES-0.1	REACTOR TRI	PAGE 11 of 20
	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
c. PRZR	9 continued from previous page 2 pressure - LESS THAN 9 PSIG	 c. <u>IF</u> pressure greater than 2260 psig and increasing. <u>THEN</u> perform the following: 1) Verify demand on PRZR pressure controller 431K greater than 50%. <u>IF NOT</u>. <u>THEN</u> place controller in MANUAL and adjust to restore PRZR pressure to approximately 2235 psig. 2) Ensure PRZR heaters off. 3) Control pressure using normal PRZR spray. <u>IF</u> normal PRZR spray <u>NOT</u> available and letdown is in service. <u>THEN</u> perform the following: a) Verify spray line fluid to PRZR AT less than 320°F. <u>IF NOT</u>. <u>THEN</u> use one PORV. b) Use auxiliary spray.
		<u>INEN</u> USE ONE FRZK FORV.

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REACTOR TRIP RESPONSE

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 10 Check If TDAFW Pump Can Be Stopped: a. Both MDAFW pumps - RUNNING b. PULL STOP TDAFW pump steam supply valves MOV-3504A MOV-3505A 	a. Go to Step 11.
11 Establish Condenser Steam Dump Pressure Control:	
a. Verify condenser available: o Any MSIV – OPEN o Annunciator G-15. STEAM DUMP ARMED – LIT	 a. Perform the following: 1) Place S/G ARV controller in AUTO at 1005 psig and verify proper operation. <u>IF</u> S/G ARV <u>NOT</u> controlling in AUTO, <u>THEN</u> control S/G ARV manually.
b. Adjust condenser steam dump controller HC-484 to 1005 psig in AUTO	2) Go to Step 11d.
c. Place steam dump mode selector switch to MANUAL	
d. Verify RCS Tavg · STABLE AT OR TRENDING TO 547°F	d. Adjust steam dump to restore Tavg. <u>IF</u> steam dumps not available, <u>THEN</u> use ARVs.

ES-0.1 REACTOR TRIP RESPONSE PAGE	13 o	
		£ 20
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED		
 12 Check RCP Status - AT LEAST ONE RUNNING a. Establich conditions for starting an RCP: Ensure bus 11A or 11B energized. Refer to ATT-15.0. ATTACL RCP START. b. Start one RCP. If an RCP can NOT be started. 7 verify natural circulation (Ret to ATT-13.0. ATTACHMENT NC). If natural circulation NOT verified. THEN increase dumping steam. 	<u>FHEN</u> fer	

ES-0.1	REACTOR TR	IP RESPONSE REV: 23
	<u> </u>	PAGE 14 c
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : Loss	of forced air cooling may re	sult in failure of NIS detectors.
	If Source Range ors Should Be Energized:	
	ce range channels – ERGIZED	a. Go to Step 13e.
	k intermediate range flux - FR CHANNEL LESS THAN	b. Perform the following:
	EITHER CHANNEL LESS THÂN 10 ⁻¹⁰ AMPS	1) <u>IF</u> neither intermediate range channel is decreasing <u>THEN</u> initiate boration.
		2) Continue with Step 14. <u>WHEN</u> flux is less than 10 ⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 13c, d and e.
c. Chec	k the following:	c. Continue with Step 14. <u>When</u> either condition met. <u>THEN</u> do
c	oth intermediate range hannels - LESS THAN 0-10 AMPS	Steps 13d and e.
	- OR ·	
	reater than 20 minutes since eactor trip	-
	fy source range detectors GIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).
		<u>IF</u> source ranges can <u>NOT</u> be restored. <u>THEN</u> refer to ER-NIS.1. SR MALFUNCTION. and go to Step 14.
sour	sfer Rk-45 recorder to one ce range and one rmediate range channel	

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REACTOR TRIP RESPONSE

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	blish Normal Shutdown nment:	
a. Ch	neck condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2.
b. Pe	erform the following:	
o	Open generator disconnects	
	1G13A719X13A73	
o	Place voltage regulator to OFF	
0	Open turbine drain valves	
o	Rotate reheater steam supply controller cam to close valves	
o	Place reheater dump valve switches to HAND	
o	Stop all but one condensate pump (Refer to T-5F, STARTING OR STOPPING THE CONDENSATE PUMPS)	
c. Ve	erify adequate Rx head cooling:	
1)) Verify at least one control rod shroud fan - RUNNING	 Manually start one fan as power supply permits (45 kw).
2)) Verify one Rx compartment cooling fan - RUNNING	2) Manually start one fan as power supply permits (23 kw).
	ispatch AO to perform ATT-17.0. ITACHMENT SD-1	

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REACTOR TRIP RESPONSE

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Maintain Stable Plant Conditions:	
a. PRZR pressure – BETWEEN 1800 PSIG AND 2260 PSIG	a. Control PRZR heaters and spray as necessary.
b. PRZR level - BETWEEN 35% AND 40%	b. Control charging as necessary.
c. S/G narrow range levelc - BETWEEN 17% AND 52%	c. Control S/G feed flow as necessary.
d. RCS Tavg - GREATER THAN 540°F	d. Close both MSIVs.
16 Check VCT Makeup System:	
a. Verify the following:	
 Adjust boric acid flow control valve to 9.5 gpm 	
 Adjust RMW flow control valve to 40 gpm 	
 RMW mode selector switch in AUTO 	
4) RMW control armed · RED LIGHT LIT	
b. Check VCT level	Manually increase VCT makeup
o Level - GREATEF THAN 20:	flow as follows:
- OF	 Ensure BA transfer pumps and RMW pumps running.
o Level - STABLE OR INCREASING	2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.

EOP: TITLE: REACTOR TR	IP RESPONSE REV: 23
	PAGE 17 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17 Check Charging Pump Suction Aligned To VCT:	
a. VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:
	 Ensure charging pump suction aligned to RWST
	o LCV-112B open
	o LCV-112C closed
	2) Continue with Step 18. <u>WHEN</u> VCT level greater than 40%. <u>THEN</u> do Step 17b.
b. Align charging jumps to VCT	
o LCV-112C OPEN	
o LCV-112F CL/GED	
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P: TINE: REACTOR TRIE	RESPONSE
	PAGE 18 c
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Verify TDAFW Pump Aligned For AUTO Start:	
a. Any MDAFW pump – AVAILABLE	a. Verify TDAFW pump operating to maintain required S/G level and go to Step 20.
b. Verify AMSAC TRIPPED status light - EXTINGUISHED	b. Reset AMSAC.
c. Verify both S/G levels - GREATER THAN 17%	c. Continue with Step 20. <u>WHEN</u> S/G level greater than 17%, <u>THEN</u> do Steps 18d, e and 19.
d. Verify Bus 11A and Bus 11B – AT LEAST ONE ENERGIZED	 d. Perform the following: 1) <u>IF</u> TDAFW pump <u>NOT</u> required to maintain S/G level, <u>THEN</u> pull stop TDAFW pump steam supply valves: MOV-3504A MOV-3505A 2) Go to Step 19.
e. Verify the following:	
1) TDAFW pump - OFF	1) Perform the following:
	a) <u>IF</u> TDAFW pump required to maintain S/G level. <u>THEN</u> go to Step 20.
	b) Stop TDAFW pump.
2) TDAFW pump steam supply valve switches in AUTO	 Place TDAFW pump steam supply valve switches in AUTO.
3) Verify TDAFW flow control valves - OPEN. DEMAND AT O	 Open TDAFW flow control valves.
 AOV-4297 AOV-4298 	

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EOP: ES-0.1	TIME: REACTOR	TRIP RESP	ONSE
			
STEP	ACTION/EXPECTED RESPONSE	RES	SPONSE NOT OBTAINED

- 19 Establish Normal AFW Pump Shutdown Alignment:
 - a. Verify the following:
 - Both S/G levels GREATER THAN 17% AND STABLE OR INCREASING
 - o Total AFW flow LESS THAN
 200 GPM
 - b. Close MDAFW pump discharge valves
 - MOV-4007
 - MOV-4008
 - c. Place AFW bypass switches to DEF
 - d. Stop all but one MDAFW pump
 - e. Open AFW discharge crossover valves
 - MOV-4000A
 - MOV-4000B
 - f. Adjust AFW bypass valves to control S/G levels
 - AOV-4480
 - AOV-4481

a. Continue with Step 20. <u>WHEN</u> conditions met, <u>THEN</u> do Steps 19b through f.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20 Determine If Cooldown Is Required:	
a. Consult Plant Staff – COOLDOWN REQUIRED	a. Go to O-3, HOT SHUTDOWN WITH XENON PRESENT.
b. At least one RCF - RUNNING	b. Perform the following:
	 Ensure 2 control rod shroud fans running.
	2) Go to ES-0.2, NATURAL CIRCULATION COOLDOWN, Step 1.
c. Go to O-2.1. NORMAL SHUTDOWN TO HOT SHUTDOWN	
-1	end -
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ES-0.1 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) ATTACHMENT LETDOWN (ATT-9.0)
- 4) ATTACHMENT RCP START (ATT-15.0)
- 5) ATTACHMENT NC (ATT-13.0)
- 6) ATTACHMENT SD-1 (ATT-17.0)
- 7) ATTACHMENT SD-2 (ATT-17.1)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 10) FOLDOUT

EOP:		
ES-0	1	

TITLE

PAGE 1 of 1

RED PATH SUMMARY

- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F <u>AND</u> RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK Narrow range level in all S/Gs less than 7% |
 [25% adverse CNMT] AND total feedwater flow
 less than 200 gpm
- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
- 2. <u>SI_ACTUATION_CRITERIA</u>

<u>IF ANY</u> condition listed below occurs, <u>THEN</u> actuate SI and CI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1:

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

o PRZR level - LESS THAN 5% [30% adverse CNMT] AND RCC subcooling based on core exit T/Cs - LESS THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

- o Any automatic SI setpoint is reached
- 3. <u>AFW SUPPLY SWITCHOVER OFITERION</u>

<u>IF</u> CST level decrease: to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

EOP:

EOP:	TITLE:	DBU. 10
ES-0.3	NATURAL CIRCULATION COOLDOWN WITH STEAM	REV: 10
	VOID IN VESSEL	PAGE 1 of 14

GINNA STATION CONTROLLED COPY NUMBER ______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

EEGORY 1.0

PEVIEWED BY:

ES-0.3

TITLE:

EOP:

- A. PURPOSE This procedure provides actions to continue plant cooldown and depressurization to cold shutdown, with no accident in progress, under conditions that allow for the potential formation of a void in the upper head region.
- B. SYMPTOMS AND/OR ENTRY CONDITIONS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - A) ES-0.2, NATURAL CIRCULATION COOLDOWN, after completing the first 13 steps, if rapid cooldown or depressurization is required.
 - B) ES-0.2, NATURAL CIRCULATION COOLDOWN, if depressurization is required which may result in upper head voiding.

EOP:	
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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAU	TION
 IF SI ACTUATION OCCURS DURING THIS INJECTION, SHOULD BE PERFORMED. 	PROCEDURE, E-O, REACTOR TRIP OR SAFETY
• THE FIRST 13 STEPS OF ES-0.2. NATU PERFORMED BEFORE CONTINUING WITH T	RAL CIRCULATION COOLDOWN, SHOULD BE HIS PROCEDURE.
• IF RCP SEAL COOLING HAD PREVIOUSLY NOT BE STARTED PRIOR TO A STATUS E	BEEN LOST, THEN THE AFFECTED RCP SHOULD
<u>NOTE</u> : Foldout page should be open and	monitored periodically.
* 1 Monitor Conditions For RCP Restart:	
a. Verify Bus 11A or Bus 11B – ENERGIZED	a. Go to Step 2.
b. Establish conditions for starting an RCP (Refer to ATT-15.0. ATTACHMENT RCP START)	b. Go to Step 2.
c. Check RVLIS indication:	c. Perform the following:
o At least one train of RVLIS AVAILABLE	 Increase PRZR level to 65% using charging and letdown.
o Level (no RCPs) - GREATER THAN 95%	 Dump steam to establish subcooling based on core exit T/Cs greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING.
	 Energize PRZR heaters as necessary to saturate PRZR water.
d. Start one RCP	
e. Any RCP - RUNNING	e. Go to Step 2.
f. Go to O-2.2. PLANT SHUTDOWN FRO HOT SHUTDOWN TO COLD CONDITION	M

EOP	
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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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STEP	ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
<u>NOTE</u> :	Saturated conditions in the PRZR should be established before trying to decrease PRZR level.
	stablish PRZR Level To ccommodate Void Growth:
a	AND 30% AND 30% A. Control charging and letdown as
Ъ	. Place charging pump speed controllers in MANUAL
* * *	<u>CAUTION</u>
	DRON ADDITION TO ESTABLISH CSD CONCENTRATION SHOULD BE COMPLETE BEFORE ECREASING RCS TEMPERATURE LESS THAN 500°F.
Pl	HE △T BETWEEN PRZR LIQUID AND THE HOT LEG TEMPERATURE SHOULD NOT BE ERMITTED TO EXCEED 200°F. IF THIS LIMIT IS EXCEEDED. THEN NOTIFY ECHNICAL ENGINEERING OF THE MAXIMUM △T OBSERVED.
* * *	
	ecrease RCS Hot Leg emperatures To 500°F:
а	. Maintain cooldown rate in RCS cold legg - LESS THAN 50°F/HR
b	. Control RCS pressure - LESS THAN 1900 PSIG
c	1900 PSIG . Maintain RCS cold leg temperatures and pressure - WITHIN LIMITS OF FIG-3.2. FIGURE
c đ	1900 PSIG Maintain RCS cold leg temperatures and pressure - WITHIN LIMITS OF FIG-3.2. FIGURE NC C/D WITH VOID IN UPPER HEAD Maintain stable PRZR level using

-	EOP: ES-0.3 TITLE: NATURAL CIRCULATION COO VOID IN	
	STEP ACTION/EXPECTED RESPONSE <u>CAUTION</u> SI ACTUATION CIRCUITS WILL AUTOMATICALLY TO GREATER THAN 1992 PSIG.	_
	 4 Verify SI Blocked: • SI block switches in BLOCK • Train A • Train B • SAFETY INJECTION BLOCKED status light - LIT 	<pre>Perform the following: a. Verify PRZR pressure less than 1950 psig. b. Place SI block switches to BLOCK: Train A Train B c. Verify SAFETY INJECTION BLOCKED status light lit. d. Go to Step 5. If SI can NOT be blocked, THEN maintain PRZR pressure greater than 1750 psig and S/G pressure greater than 514 psig until SI blocked.</pre>

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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * *	CAUTION	* * * * * * * * * * * * * * * * * * * *
קון אינר ווס	DED HEAD DECION MAY VOID DUDING DCS	DEPRESSURIZATION. THIS WILL RESULT
	APIDLY INCREASING PRZR LEVEL.	DERESSORIZATION. THIS WILL RESULT
* * * *	* * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> :	ο If charging line to PRZR vapor Δ' should be consulted before using	
	o WHEN using a PRZR PORV, THEN selo valve.	ect one with an operable block
	o If auxiliary spray is in use. sp closing normal charging valve AO	ray flow may be increased by V-294 and normal PRZR spray valves.
5 Dep	ressurize RCS To 1500 PSIG:	
a.	Check letdown - IN SERVICE	a. Try to establish letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN).
		<u>IF</u> letdown can <u>NOT</u> be established, <u>THEN</u> depressurize RCS using one PRZR PORV and go to Step 5c.
	Depressurize RCS using auxiliary spray valve (AOV-296)	b. <u>IF</u> auxiliary spray valve <u>NOT</u> available. <u>THEN</u> use one PRZR PORV.
	Check RCS pressure – APPROXIMATELY 1500 PSIG	c. Return to Step 5a.
d. :	Stop RCS depressurization	

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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

a. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
b. Close SI ACCUM discharge valves	b. Perform the following:
 ACCUM A. MOV-841 ACCUM B. MOV-865 	 Dispatch personnel to locally close valves, as necessary.
	2) Maintain RCS pressure greater than 1000 psig until both SI ACCUMs isolated.
	<u>IF</u> any SI ACCUM can <u>NOT</u> be isolated <u>AND</u> RCS depressurization to less than 1000 psig is required. <u>THEN</u> :
	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	2) Open HCV-945.
	3) Maintain RCS pressure greate: than SI ACCUM pressure.
c. Locally open breakers for MOV-841 and MOV-805	

	LE: NATURAL CIRCULATION C	OOLDOWN WITH STFAM	REV: 10
ES-0.3		N VESSEL	PAGE 8 of 14
STEP ACTI	ON/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
* * * * * * *	CAUTI	<u>101</u>	* * * * * * * *
IF RCP SEAL EXCEED 60°F/	COOLING TO ANY RCP IS LOST, HR.	. THEN THE RCS COOLDOWN RA	TE SHALL NOT
* * * * * * *		* * * * * * * * * * * *	* * * * * * * *
	RCS Cooldown And rization:		
	in cooldown rate in RCS egs - LESS THAN 100°F/HR		
LIMITS	in RCS pressure - WITHIN OF FIG-3.2. FIGURE NC C/D DID IN UPPER HEAD		
	RCS cold leg temperature - R THAN 335°F	c. Stabilize RCS temp	erature.
d. Check	letdown IN SERVICE	d. Try to establish l to ATT-9.0, ATTACH	
		<u>IF</u> letdown can <u>NOT</u> established, <u>THEN</u> RCS using one PRZR to Step 8.	depressurize
e. Depres	durize ECC using auxiliary valve (AOV 295)	e. <u>IF</u> auxiliary spray available, <u>THEN</u> us	

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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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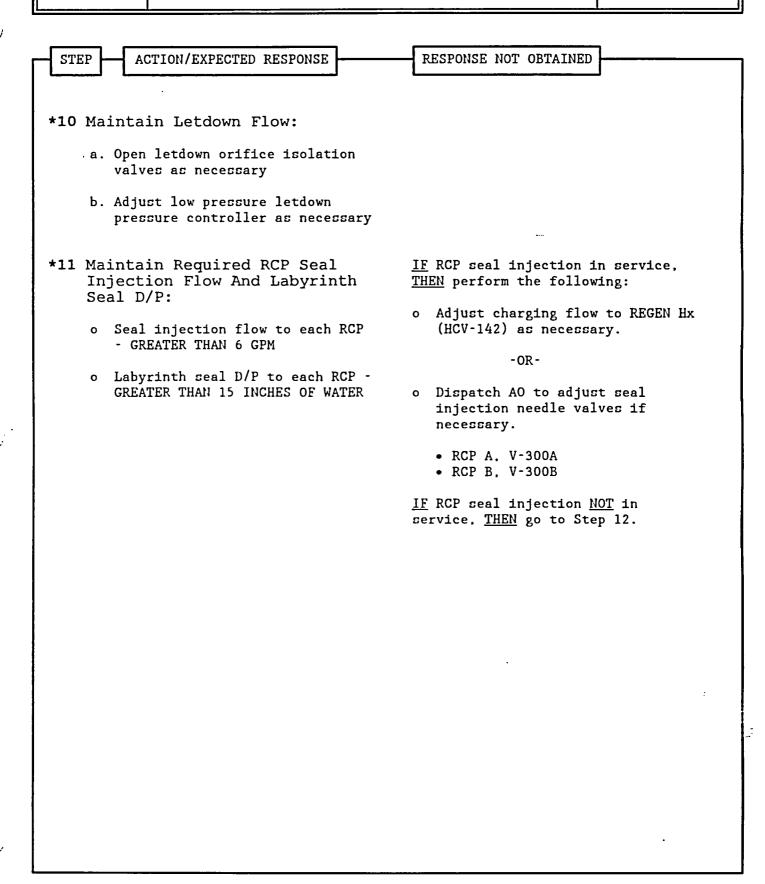
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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	8 Control PRZR Level:	
	a. Level - GREATER THAN 13%	a. Control charging and letdown to increase PRZR level to greater than 13%.
	b. Level - LESS THAN 90%	b. Perform the following:
		 Turn on PRZR heaters to increase RCS pressure by 100 psi.
		2) Decrease PRZR level to less than 30% by one of the following:
		o Control charging as necessary.
; ·		- OR -
\bigcirc		o Continue cooldown to shrink RCS inventory.
	9 Check RVLIS Indication:	
	a. At least one train of RVLIS – AVAILABLE	a. Go to Step 10.
	b. Check RVLIS level (no RCPs) - GREATER THAN 93%	b. Perform the following:
	GREATER INAL 93 M	1) Repressurize RCS to maintain RVLIS level greater than 93%.
		2) Return to Step 7.
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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
	12 Check If SI System Normal Shutdown Alignment Should Be Established:		
		•	
	a. RCS cold leg temperature - LESS . THAN 350°F	a. Return to Step 7.	
•	b. Lock out SI system as follows:		
	1) Place all SI pump switches in PULL STOP		
	2) Locally close breakers for SI pump discharge valves to cold legs		
	 MOV-878B, MCC D position 8C MOV-878D, MCC D position 8F 		
\bigcirc	3) Close SI pump discharge to cold legs		
	• MOV-8/86 • MOV-8/80		
	4) Locally open breakers for MOV-8/8B and HOV-8/8D		
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TITLE: NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL

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protection system in service system can <u>NOT</u> be placed in (Refer to 0-7, ALIGNMENT AND service, <u>THEN</u> consult Plant	TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 b. Verify all SI pump switches in PULL STOP c. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL) return to Step 7. b. Return to Step 12. c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> consult Plant staff to determine if RHR norm cooling should be established and go to Step 14. 14 Continue RCS Cooldown To Cold 		
 PULL STOP c. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL) c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> consult Plant staff to determine if RHR norm cooling should be established and go to Step 14. 	a. RCS pressure – LESS THAN 400 PSIG	
<pre>protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)</pre> system can <u>NOT</u> be placed in service, <u>THEN</u> consult Plant staff to determine if RHR norm cooling should be established and go to Step 14. 14 Continue RCS Cooldown To Cold		b. Return to Step 12.
(Refer to ATT-14.1. ATTACHMENT RHR COOL) 14 Continue RCS Cooldown To Cold	protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL	service, <u>THEN</u> consult Plant staff to determine if RHR normal cooling should be established
	(Refer to ATT-14.1, ATTACHMENT	
		•

EOP: ES-0.3	TIRE: NATURAL CIRCULATIO VOI	ON COOLDOWN WIT	TH STEAM	REV: 10 PAGE 13 of
STEP A	CTION/EXPECTED RESPONSE	RESPONS	E NOT OBTAINED	<u>]</u>
* * * * * *	• • • • • • • • • • • • • • • • • • •	CAUTION	* * * * * * * *	* * * * * *
	ZING THE RCS BEFORE THE I VOID FORMATION IN THE R		S THAN 200°F MA	Y RESULT IN
			* * * * * * * *	* * * * * * *
	ue Cooldown Of Inacti n Of RCS:	ive		
	upper head region using rol rod shroud fans			
	S/G U-tubes by dumping m from all S/Gs			
c. Chec	k RVLIS indication:			
	t least one train of RVL. VAILABLE	15 · 1) Go	to Step 16.	
	evel (no RCP::) GREATER HAN 95%		abilize RCS pre turn to Step 14	
				-

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ES-0.3	TION COOLDOWN WITH STEAM VOID IN VESSEL PAGE 14 c
STEP ACTION/EXPECTED RESPO	E RESPONSE NOT OBTAINED
* * * * * * * * * * * * * * * * *	<u>CAUTION</u>
IF NO CONTROL ROD SHROUD FANS ABOVE 200°F FOR UP TO 29 HOURS	RE RUNNING. THE UPPER HEAD REGION MAY REMAIN AFTER REACHING CSD.
	· • • • • • • • • • • • • • • • • • • •
16 Determine If RCS Depressurization Is Per	itted:
a. Check PRZR level – LESS	AN 30% a. Perform the following:
	 Turn on PRZR heaters to maintain PRZR pressure stable
	2) Decrease PRZR level to less than 30% by one of the following:
	o Control charging as necessary.
	- OR -
	o Continue cooldown to shrink RCS inventory.
 b. Entire RCC - LECC THAN : Core exit T/Cc 	b. Do <u>NOT</u> depressurize RCS. Return to Step 14.
 Upper head T/Gs RCS hot leg temperatur RCS cold leg temperatur 	
c. Check control rod shroud status – BOTH RUNNING DU COOLDOWN	
d. Refer to 0-2.2. PLANT SH FROM HOT SHUTDOWN TO COL CONDITIONS	TIOWN
	· END ·

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ES-0.3 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE NC C/D WITH VOID IN UPPER HEAD (FIG-3.2) -
- 3) ATTACHMENT RCP START (ATT-15.0)
- 4) ATTACHMENT RHR COOL (ATT-14.1)
- 5) ATTACHMENT LETDOWN (ATT-9.0)
- 6) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 7) FOLDOUT

ES-0.3

EOP:

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI ACTUATION CRITERIA</u>

<u>IF EITHER</u> condition listed below occurs, <u>THEN</u> actuate SI and CI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5%

3. <u>AFW SUPPLY SWITCHOVER CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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ES-1.1	SI TERMINATION	
		PAGE 1 of 2

GINNA STATION CONTROLLED COPY NUMBER ______

RESPONSIBLE MANAGER

11 - 17 - 2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

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ES-1.1	SI TERN	IINATION
		PAGE 2 of 26

- A. PURPOSE This procedure provides the necessary instructions to terminate safety injection and stabilize plant conditions.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, and
 E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
 when specified termination criteria are satisfied.
 - b. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and SI has been terminated.

OP:	TIRE:		REV: 27
ES-1.1	SI TERM	IINATION	PAGE 3 of 2
<u>-</u>			
STEP A	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBT	AINED
* * * * *	* * * * * * * * * * * * * * *		* * * * * * * * * *
	CAUTI	<u>0N</u>	
	E POWER IS LOST AFTER SI RESET T SAFEGUARDS EQUIPMENT. (REFE OWER)		
* * * * *	* * * * * * * * * * * * * * * *	* * * * * * * * * * *	* * * * * * * * * *
<u>NOTE</u> : o	FOLDOUT page should be open AN	D monitored periodical	lly.
	Critical Safety Function Statu to Appendix I for Red Path Sum		Ltored (Refer
	Adverse CNMT values should be a greater than 4 psig or CNMT rad		
1 Reset	SI		
2 Reset	CI:		
a. Dep	ress CI reset pushbutton		
	ify annunciator A-26, CNMT	b. Perform the fol	llowing:
150	LATION - EXTINGUISHED	1) Reset SI.	
		2) Depress CI r	reset pushbutton.
	ain PRZR Pressure en 1800 PSIG And PSIG		

o Reset PRZR heaters

.

o Use normal PRZR spray

STEP ACTION	N/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Verify Ade	equate SW Flow:	
a. Check at RUNNING	least two SW pumps –	a. Manually start SW pumps as power supply permits (257 kw each).
		<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
		1) Ensure SW isolation.
		2) <u>IF</u> <u>NO</u> SW pumps running. <u>THEN</u> perform the following:
		a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress VOLTAGE SHUTDOWN pushbutton.
		b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
		3) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
shutdown	AO to establish normal alignment (Refer to . ATTACHMENT SD-1)	

•	EOP:			REV: 27
	E5-1.1	51		PAGE 5 of 26
	ES-1.1 STEP A 5 Establ a. Veri ener o E o E b. Chec	SI CTION/EXPECTED RESPONSE ish IA to CNMT: fy non-safeguards busses gized from offsite power aus 13 normal feed - CLOS -OR- bus 15 normal feed - CLOS	ED 1) Close non-safegua breakers: • Bus 13 to Bus 1 • Bus 15 to Bus 1 ED 2) Verify adequate end capacity to run and compressors (75 known IF NOT. THEN performed following: • Start diesel and compressor (real ATT-11.2, ATTANNE DIESEL AIR COM -OR- • Evaluate if CN fans should be (Refer to ATT- ATTACHMENT CNM FANS) 3) WHEN bus 15 restores reset control roo	PAGE 5 of 26 g: rds bus tie 4 tie 6 tie mergency D/G ir w each). orm the ir fer to CHMENT PRESSOR) MT RECIRC stopped 4.0, T RECIRC red. <u>THEN</u> m lighting.
		S RUNNING	 Restore IA using compressor <u>OR</u> die compressor (refer A'IT-11.2, ATTACHM AIR COMPRESSOR) Go to step 5d. 	service air sel air to
\bigcirc	This St	ep continued on the next	page.	

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STEP ACTION/EXPECTED RESPONSE (Step 5 continued from previous pa	RESPONSE NOT OBTAINED
 c. Verify SW isolation values to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 	 c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.
d. Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started. <u>THEN</u> start diesel air compressor (refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR).
e. Check IA supply:	e. Perform the following:
 Pressure - GREATER THAN 60 PSIG Pressure - STABLE OR INCREASING 	 Continue attempts to restore IA (Refer to AP-IA.1. LOSS OF INSTRUMENT AIR). Continue with Step 6. <u>WHEN</u> IA restored. <u>THEN</u> do Steps 5f and g.
f. Reset both trains of XY relays for IA to CNMT AOV-5392	
g. Verify IA to CNMT AOV-5392 - OPE	

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5 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
· · ·	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to close seal injection needle valve(s) to affected RCP:
	• RCP A. V-300A • RCP B. V-300B
	2) Ensure HCV-142 open, demand at 0%.
b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
o LCV-112B - OPEN	IF LCV-112B can <u>NOT</u> be opened.
o LCV-112C - CLOSED	THEN dispatch AO to locally ope V-358, manual charging pump suction from RWST (charging pum room).
	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

ES-1.1	TITLE:	SI TER	MINATIOŃ	REV: 27
			······································	PAGE 8 of
		_		
STEP A	ACTION/EXPECTED RESPONS	E	RESPONSE NOT	OBTAINED
	SI And RHR Pumps An In AUTO	d		
8 Monito Criter	or SI Reinitiation			•
exi USI	subcooling based on c t T/Cs - GREATER THAN NG FIG-1.0, FIGURE MIN COOLING	ore D°F	a. Manually sta necessary ar REACTOR OR S Step 1.	art SI pumps as nd go to E-1, LOSS OF SECONDARY COOLANT,
	R level – GREATER THAN % adverse CNMT]	10%	b. Control char maintain PR2	
			maintained, SI pumps as E-1, LOSS OF	el can <u>NOT</u> be <u>THEN</u> manually start necessary and go to REACTOR OR DOLANT. Step 1.
				•

ES-1.1 SI TERM	INATION PAGE 9 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Monitor If CNMT Spray Should Be Stopped:	
a. CNMT spray pumps – RUNNING	a. Go to Step 10.
b. Check CNMT pressure – LESS THAN 4 PSIG	b. Continue with Step 10. <u>WHEN</u> CNMT pressure less than 4 psig. <u>THEN</u> do Steps 9c through f.
c. Reset CNMT spray	
d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE.
	AOV-836AAOV-836B
e. Stop CNMT spray pumps and place in AUTO	
f. Close CNMT spray pump discharge valves	
 MOV-860A MOV-860B MOV-860C MOV-860D 	

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ES-1.1 SI TERM	IINATION PAGE 10 o
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 Verify MRPI Indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	<u>IF</u> one or more control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following:
	a. Place RMW mode selector switch to BORATE.
	b. Adjust boric -acid flow control valve, FCV-110A, for desired flowrate.
	c. Set boric acid integrator to desired amount (650 gallons for each control rod not fully inserted).
	d. Place RMW control to start and verify flow. <u>IF</u> flow can <u>NOT</u> be established. <u>THEN</u> refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.
11 Establish Condenser Steam Dump Pressure Control:	
a. Verify condenser available:	a. Place S/G ARV controllers in AUTO at desired pressure and go
o Any MSIV - OPEN o Annunciator G-15. STEAM DUMP ARMED - LIT	to Step 12.
b. Adjust condenser steam dump controller HC-484 to desired pressure and verify in AUTO.	
c. Place steam dump mode selector switch to MANUAL.	
	•

<pre>STEP ACTION/EXPECTED RESPONSE 12 Check RCS Hot Leg Temperatures - STABLE 13 Verify Adequate SW Flow To . CCW Hx: a. Verify at least two SW pumps - RUNNING</pre>	PAGE 11 c RESPONSE NOT OBTAINED Control steam dump and total feed flow to stabilize RCS temperature. a. Manually start pumps as power supply permits (257 kw each). IF less than two SW pumps can be operated. THEN perform the following:
<pre>12 Check RCS Hot Leg Temperatures - STABLE 13 Verify Adequate SW Flow To · CCW Hx: a. Verify at least two SW pumps -</pre>	Control steam dump and total feed flow to stabilize RCS temperature. a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
Temperatures - STABLE 13 Verify Adequate SW Flow To . CCW Hx: a. Verify at least two SW pumps -	<pre>flow to stabilize RCS temperature. a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:</pre>
 CCW Hx: a. Verify at least two SW pumps - 	supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
	supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
-	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	 <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	3) Go to Step 19.
b. Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	·.
c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Manually start an additional SW pump as power supply permits (257 kw each).

ES-1.1 SI TERM	REV: 27
	PAGE 12 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14 Check If Normal CVCS Operation Can Be Established	
a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN	a. Continue with Step 19. <u>WHEN</u> IA can be restored,THEN do Steps 14 through 18.
 IA pressure - GREATER THAN 60 PSIG 	
b. Verify instrument bus D – ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available. <u>THEN</u> perform the following:
	1) Verify MCC A energized.
	 Place instrument bus D on maintenance supply.
c. CCW pumps - ANY RUNNING	c. Perform the following:
	 <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A. MOV-749A and MOV-759A RCP B. MOV-749B and MOV-759B
	2) Manually start one CCW pump.
d. Charging pump - ANY RUNNING	d. Continue with Step 19. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 15 through 18.

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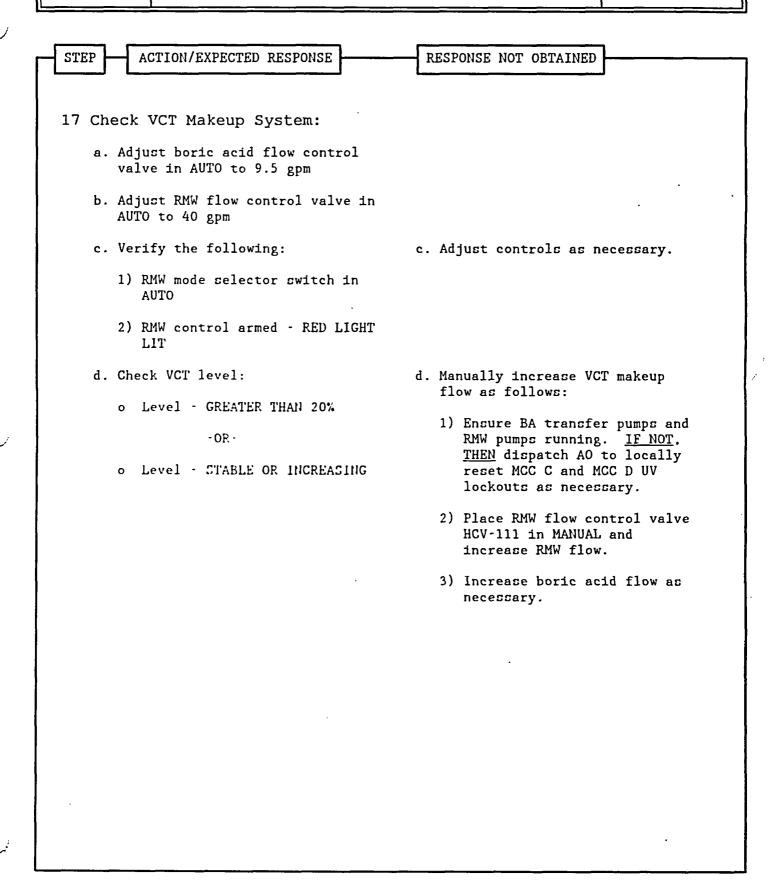
[L
15 Verify PRZR Level - GREATER THAN 20% [40% adverse CNMT]	Continue with Step 17. <u>WHEN</u> PRZR level increases to greater than 20% [40% adverse CNMT]. <u>THEN</u> do Step 16
16 Establish Normal Letdown:	<u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess
a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM	letdown as follows:
b. Place the following switches to CLOSE:	o Place excess letdown divert valve, AOV-312, to NORMAL.
 Letdown orifice valves (AOV-200A. AOV-200B. and 	o Ensure CCW from excess letdown open, (AOV-745).
AOV-202) • AOV-371, letdown isolation valve	o Open excess letdown isolation valve AOV-310.
 AOV-427. loop B cold leg to REGEN Hx 	o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less
c. Place letdown controllers in _ MANUAL at 40% open	than 100 psig.
• TCV-130 • PCV-135	 Adjust charging pump speed as necessary.
d. Reset both trains of XY relays for AOV-3/1 and AOV-42/	<u>IF RCP seal return NOT</u> established. <u>THEN</u> consult Plant Staff to determine if excess letdown should be placed in service
e. Open AOV-3/1 and AOV-427	be placed in service.
<pre>f. Open letdown orifice valves as necessary</pre>	
g. Place PCV-135 in AUTO at 250 pci;	
h. Place TCV-130 in AUTO at the normal setpoint	· · · · · · · · · · · · · · · · · · ·
1. Adjust charging pump speed and HCV-142 as necessary to control PRZR level	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Check Charging Pump Suction Aligned To VCT:	
a. VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:
	 Ensure charging pump suction aligned to RWST
	o LCV-112B open
	o LCV-112C closed
	2) Continue with Step 19. <u>WHEN</u> VCT level greater than 40%. <u>THEN</u> do Step 18b.
b. Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
o LCV-112C - OPEN	
o LCV-112B - CLOSED	
	· · · ·

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Operate Normal Spray To Stabilize RCS Pressureletdown is in service. THEN performed the following:a. Verify Regen Hx Chg outlet ter to PRZR Vapor temp AT less th 320°F. IF NOT. THEN control pressure using one PRZR PORV go to Step 20.b. Control pressure using auxilia spray.IF auxiliary spray NOT available THEN use one PRZR PORV.NOTE:NOTE:TDAFW pump flow control AOVs may drift open on loss of IA.*20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT]a. Naintain total feed flow great than 200 gpm until narrow rang level greater than 7% [25% adverse CNMT] in at least one S/G.b. Control feed flow to maintainb. IF narrow range level in any set	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<pre>closing normal charging valve AOV-294 and normal PRZR spray valves 19 Control PRZR Heaters And Operate Normal Spray To Stabilize RCS Pressure a. Verify Regen Hx Chg outlet ten to PRZR Vapor temp AT less th 320°F. IF NOT. THEN control pressure using one PRZR PORV. go to Step 20. b. Control pressure using auxili. spray. IF auxiliary spray NOT available THEN use one PRZR PORV. NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. *20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. IF narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. Control feed flow to maintain b. If narrow range level in any file b. If</pre>		elect one with an operable block
Operate Normal Spray To Stabilize RCS Pressureletdown is in service. THEN perf the following:a. Verify Regen Hx Chg outlet ter to PRZR Vapor temp AT less th 320°F. IF NOT. THEN control pressure using one PRZR PORV. go to Step 20.b. Control pressure using auxili spray.IF auxiliary spray NOT spray.NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.*20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT]a. Maintain total feed flow great than 200 gpm until narrow rang level greater than 7% [25% adverse CNMT] in at least one S/G.b. Control feed flow to maintainb. IF narrow range level in any		
to PRZR Vapor temp AT less th 320°F. <u>IF NOT</u> . <u>THEN</u> control pressure using one PRZR PORV go to Step 20. b. Control pressure using auxili spray. <u>IF</u> auxiliary spray <u>NOT</u> available <u>THEN</u> use one PRZR PORV. <u>NOTE</u> : TDAFW pump flow control AOVs may drift open on loss of IA. 20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain b. <u>IF</u> narrow range level in any f	Operate Normal Spray To	<u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> perfor the following:
spray. <u>IF</u> auxiliary spray <u>NOT</u> available <u>THEN</u> use one PRZR PORV. <u>NOTE</u> : TDAFW pump flow control AOVs may drift open on loss of IA. 20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain b. <u>IF</u> narrow range level in any second		pressure using one PRZR PORV an
THEN use one PRZR PORV. NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. 20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain b. LF narrow range level in any		b. Control pressure using auxiliar spray.
 20 Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G. b. <u>IF</u> narrow range level in any set 		<u>IF</u> auxiliary spray <u>NOT</u> available. <u>THEN</u> use one PRZR PORV.
 a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G. b. <u>IF</u> narrow range level in any 	<u>NOTE</u> : TDAFW pump flow control AOVs may (lrift open on loss of IA.
THAN 7% [25% adverse CNMT] than 200 gpm until narrow ran level greater than 7% [25% adverse CNMT] in at least one S/G. b. Control feed flow to maintain b. <u>IF</u> narrow range level in any s	20 Monitor Intact S/G Levels:	
		adverse CNMT] in at least one
narrow range level between 17% continues to increase. <u>THEN</u> s [25% adverse CNMT] and 50% feed flow to that S/G.		b. <u>IF</u> narrow range level in any S/ continues to increase. <u>THEN</u> sto feed flow to that S/G.

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ES-1.1	SI	SI TERMINATION		PAGE	17 of	26	
		<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>					
STEP A	CTION/EXPECTED RESPONSE	[]	RESPONSE	NOT OBTAINED	}		
<u>NOTE</u> : SW s	hould be aligned to CCW H	⊥ lxs before	restorir	ng RCP seal co	oling.		
	RCP Cooling:	(1	Refer to	normal coolin ATT-15.2, ATT			
a. Chec	k CCW to RCPs:	C	DOLING).		•		
R	nnunciator A·7. RCP 1A CC ETURN HIGH TEMP OR LOW FI EXTINGUISHED						
R	nnunciator A-15. RCP 1B C ETURN HIGH TEMP OR LOW FI EXTINGUISHED						
b. Chec	k RCP seal injection:						
	abyrinth seal D/Ps – GREA HAN 15 INCHES WATER	ATER					
	- OR -						
	CP seal injection flow to ach RCP · GREATER THAN 6						
				•			
						•	

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l	·····			
				_
	CTION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED	
	If Seal Return Flow Be Established:			
	fy RCP #1 seal outlet erature - LESS THAN 235°		. Go to Step 23.	
b. Veri OPEN	fy RCP seal outlet valve	s - 1	Manually open valves necessary.	8 85
	V-270A V-270B			
for	t both trains of XY rela RCP seal return isolatio e MOV-313			
	RCP seal return isolati e MOV-313	on d	. Perform the followin	g:
Valv	e 110V 315		1) Place MOV-313 swi	tch to OPEN.
			2) Dispatch AO to lo MOV-313.	cally open
	fy RCP #1 seal leakoff f SS THAN 6.0 GPM	low e	e. Perform the followin	eg:
LE	SS THAN 0.0 GFM		1) Trip the affected	RCP
			2) Allow 4 minutes f coast down. <u>THEN</u> affected RCP seal valve.	close the
			 RCP A, AOV-270A RCP B, AOV-270B 	
			<u>IF</u> both RCP seal dis valves are shut. <u>THE</u> Step 23.	
	fy RCP #1 seal leakoff f EATER THAN 0.8 GPM	low t	. Refer to AP-RCP.1. R MALFUNCTION.	CP SEAL

EOP:					<u> </u>
ES-1.		SI TERMIN	INTION	REV: 27	
	· <u> </u>			PAGE 19 of	26
EN 0	ACTION/EXPECTED RESPO Prify All AC Busses - NERGIZED BY OFFSITE PO Normal feed breakers to volt busses - CLOSED 480 volt bus voltage - O THAN 420 VOLTS Emergency D/G output bre OPEN	DWER all 480 GREATER	RESPONSE NOT OBTAINED Perform the following: a. <u>IF</u> any AC emergency feed breaker open, <u>T</u> associated D/G break b. Perform the followin necessary: 1) Close non-safegua breakers: Bus 13 to Bus 1 Bus 13 to Bus 1 Bus 15 to Bus 1 2) Reset Bus 13 and lighting breakers 3) Dispatch AO to lo and start two IA 4) Place the followin PULL STOP: EH pumps Turning gear oi HP seal oil bac 5) Restore power to A from Bus 13 B from Bus 15 F from Bus 15 o) Start HP seal oil	bus normal <u>HEN</u> ensure er closed. g as rds bus tie 4 tie 6 tie Bus 15 cally reset compressors. ng pumps in 1 pump kup pump MCCs.	

- /) Start CNMT RECIRC fans as necessary.
- 8) Ensure D/G load within limits.
- 9) Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power.
- c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

ES-1.1	TILE: SI TEF	MINATION	REV: 27 PAGE 20 of 2
	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	
fail 24 Check	ure of NIS detectors. If Source Range		
a. Sour	ls Should Be Energized: ce range channels - ERGIZED	a. Go to Step 24e.	
EITH	k intermediate range flux - ER CHANNEL LESS THAN O AMPS	b. Perform the follow 1) <u>IF</u> neither inte channel is decr initiate borati	rmediate range easing, <u>THEN</u>
		2) Continue with S flux is LESS TH on any operable do Steps 24c. d	AN 10 ⁻¹⁰ amps channel, <u>THEN</u>
o B c	k the following: oth intermediate range hannels - LESS THAN D-10 AMPS	c. Continue with step either condition m Steps 24d and e.	
	-OR- reater than 20 minutes since eactor trip		
	fy source range detectors GIZED	d. Manually energize detectors by depre permissive defeat of 2).	ssing P-6
	. •	<u>lF</u> source ranges c restored. T <u>HEN</u> ref ER-NIS.1. SR MALFU to Step 25.	er to
sour	sfer Rk-45 recorder to one se range and one rmediate range channel		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	eck If Emergency D/Gs	
	ould Be Stopped:	
а.	Verify AC emergency busses energized by offsite power:	a. Try to restore offsite power (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).
	o Emergency D/G output breakers - OPEN	
	o AC emergency bus voltage - GREATER THAN 420 VOLTS	
	o AC emergency bus normal feed breakers – CLOSED	
b.	Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	
		•
		· · · · · · · · · · · · · · · · · · ·

ES-1.1	SI TERMI	NATION	REV: 27
			PAGE 22 O
[] [[
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	2D
* * * * *		* * * * * * * * * * * *	* * * * * * *
	<u>CAUTION</u>	!	
	EAL COOLING HAD PREVIOUSLY BEEN L TARTED PRIOR TO A STATUS EVALUATI		RCP SHOULD
* * * * *	* * * * * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * *
		.	
	k RCP Status		
a. Bo	oth RCPs - STOPPED	a. Go to step 27.	
	sure conditions for starting A RCP:	b. <u>IF</u> conditions can <u>THEN</u> perform the f	
o	Ensure bus 11A or 11B energized.	 Verify natural (Refer to ATT-1 ATTACHMENT NC). 	3.0,
o	Refer to ATT-15.0. ATTACHMENT RCP START.	<u>IF</u> natural circ <u>NOT</u> be verified increase dumpin intact S/Gs.	ulation can . <u>THEN</u>
		2) Go to step 27.	

	EOP:			REV: 27
	ES-1.1		SI TERMINATION	
)	L L	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
	≥ 95	k RVLIS level (no RCPs) -	 c. <u>IF</u> RVLIS level (no than 95%. <u>THEN</u> perf following: o Increase PRZR le greater than 65% CNMT). o Dump steam to es subcooling based T/Cs to greater using FIG-1.0. F SUBCOOLING. o Energize PRZR he necessary to sat water. <u>IF</u> conditions <u>NOT</u> m continue with Step conditions met. <u>THE</u> d. <u>IF</u> an RCP can <u>NOT</u> b <u>THEN</u> verify natural (Refer to ATT-13.0. NC). <u>IF</u> natural circulat verified. <u>THEN</u> incr steam from intact S 	orm the vel to (82% adverse tablish RCS on core exit than 20°F IGURE MIN aters as urate PRZR et. <u>THEN</u> 27. <u>WHEN</u> N do Step 26d. e started. circulation ATTACHMENT ion <u>NOT</u> ease dumping
)				

EOP: ES-1.1	SI TERM	INATION	REV: 27 PAGE 24 of
- STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	·
27 Establ Alignm	ish Normal Shutdown ent:		_
a. Check condenser – AVAILABLE		a. Dispatch AO to perfo ATTACHMENT SD-2.	orm ATT-17.1,
b. Peri	form the following:		
o (pen generator disconnects		
	1G13A71 9X13A73		
o I	Place voltage regulator to OFF		
ο (pen turbine drain valves		
	Rotate reheater steam supply controller cam to close valves		
	Place reheater dump valve witches to HAND		
I	Stop all but one condensate oump (Refer to T-5F. STARTING OR STOPPING THE CONDENSATE PUMPS		
c. Veri	fy adequate Rx head cooling:		
	erify at least one control od shroud fan - RUNNING	 Manually start or power supply perr 	
	Verify one Rx compartment cooling fan - RUNNING	2) Perform the follo	owing:
		o Dispatch AO to relays at MCC	
		o Manually star power supply p (23 kw)	
	fy ATT-17.0. ATTACHMENT SD-1 MPLETE		

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28 Maintain Plant Conditions Stable:	
a. RCS pressure – BETWEEN 1800 PSIG AND 2235 PSIG	a. Control PRZR heaters and spray as necessary.
b. PRZR level - BETWEEN 35% AND 40%	b. Control charging as necessary.
c. Intact S/G narrow range levels - BETWEEN 17% AND 52%	c. Control S/G feed flow as necessary.
d. RCS cold leg temperature - STABLE	d. Control dumping steam as necessary. <u>IF</u> cooldown continues. <u>THEN</u> close both MSIVs.
9 Monitor SI Reinitiation Criteria:	
a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN . SUBCOOLING	a. Manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
<pre>b. PRZR level - GREATER THAN 10% [30% adverse CNMT]</pre>	b. Control charging flow to maintain PRZR level.
	<u>IF</u> PRZR level can <u>NOT</u> be maintained. <u>THEN</u> manually start SI pumps as necessary and go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT. Step 1.

EOP: ES-1.1	TITLE:	I TERMINA	ATION		REV: PAGE		of
						20	
	ACTION/EXPECTED RESPONSE	7	RESPONSE	NOT OBTAINED	L		
30 Implem Proced	ment Plant Recovery dures:						
rea (Rei	iew plant systems for lignment to normal condi fer to ATT-26.0, ATTACHM URN TO NORMAL OPERATIONS	IENT					
	to O-2.1. NORMAL SHUTDOW SHUTDOWN	IN TO					
		- END -					

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EOP:	
ES-1	 1

ES-1.1 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 4) ATTACHMENT D/G STOP (ATT-8.1)
- 5) ATTACHMENT NC (ATT-13.0)
- 6) ATTACHMENT SEAL COOLING (ATT-15.2)
- 7) ATTACHMENT RCP START (ATT-15.0)
- 8) ATTACHMENT SD-1 (ATT-17.0)
- 9) ATTACHMENT SD-2 (ATT-17.1)
- 10) ATTACHMENT SI/UV (ATT-8.4)
- 11) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 12) ATTACHMENT RETURN TO NORMAL OPERATIONS (ATT-26.0)
- 13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 14) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 15) FOLDOUT

	EOP:	-	TITLE:			REV:	27
	ES-1.1				SI TERMINATION		1 of 1
/	<u> </u>			RED	PATH SUMMARY		<u> </u>
	a.	SUBCE	RITICALI	[TY - Nuclear	power greater than 5%		
	b.	CORE	COOLING	G - Core exit	T/Cs greater than 1200°F -OR-		
					T/Cs greater than 700°F <u>AN</u> el (no RCPs) less than 52% NMT]		
	c.	HEAT	SINK -		level in all S/Gs less tha CNMT] <u>AND</u> total feedwater 0 gpm		I
	d.	INTEC	GRITY -	100°F in las	peratures decrease greater t 60 minutes <u>AND</u> RCS cold l less than 285°F		
	e.	CONT	INMENT	- CNMT press	ure greater than 60 psig		

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ES-1.1

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FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI_REINITIATION_CRITERIA</u>

Following SI termination, <u>IF EITHER</u> condition listed below occurs, <u>THEN</u> manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1: o RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING

FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 10%
[30% adverse CNMT]

3. <u>SECONDARY INTEGRITY CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1.

4. <u>AFW SUPPLY SWITCHOVER CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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EOP:

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GINNA STATION CONTROLLED COPY NUMBER _23

PONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:

EOP:	TITLE:	REV: 27
ES-1.2	POST LOCA COOLDOWN AND DEPRESSURIZATION	PAGE 2 of 28

- A. PURPOSE This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions following a loss of reactor coolant inventory.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:

E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when RCS pressure is greater than the shutoff head pressure of the RHR pumps.

EOP:	
ES	-1.2

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POST LOCA COOLDOWN AND DEPRESSURIZATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * *	· · · · · · · · · · · · · · · · · · ·	* * * * * * * * * * * * * * * * * * * *
	CAUT	<u>'ION</u>
UNCON	RESSURE SHOULD BE MONITORED. IF TROLLED MANNER TO LESS THAN 250 P UMPS MUST BE MANJALLY RESTARTED T	SIG [465 PSIG ADVERSE CNMT], THEN THE .
* * *		* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> :	o Foldout page should be open a	nd monitored periodically.
	o Adverse CNMT values should be greater than 4 psig or CNMT r	used whenever CNMT pressure is adiation is greater than 10 ⁺⁰⁵ R/hr.
	nitor If RHR Pumps Should Stopped:	
a.	RHR pumps - ANY RUNNING IN INJECTION MODE	a. Go to Step 2.
b.	Check RCS pressure:	b. Go to Step 2.
	1) Pressure - GREATEP THAN 250 psig (405 psig adverse CNMT)	
	2) Pressure - STABLE OR INCREASING	
c.	Stop RHR pump: and place AUTO	
····		· · · · · · · · · · · · · · · · · · ·

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POST LOCA COOLDOWN AND DEPRESSURIZATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 * 2 Monitor All AC Busses - BUSSES ENERGIZED BY OFFSITE POWER Normal feed breakers to all 480 volt busses - CLOSED 480 bus voltage - GREATER THAN 420 VOLTS Emergency D/G output breakers - OPEN 	 Perform the following: a. <u>IF</u> any AC emergency bus normal feed breaker open. <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following, as necessary: Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie Place the following pumps in PULL STOP: EH pumps Turning gear oil pump HP seal oil backup pump Restore power to MCCs. A from Bus 13 B from Bus 15 F from Bus 15 F from Bus 15 Start HP seal oil backup pump. Start HP seal oil backup pump. Ensure D/G load within limits. WHEN bus 15 restored. <u>THEN</u> reset control room lighting. Refer to ATT-8.4. ATTACHMENT SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC bucses (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).

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POST LOCA COOLDOWN AND DEPRESSURIZATION

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3 Establish 75 GPM Charging Flow:	
a. Charging pumps - ANY RUNNING	 a. Perform the following: 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally isolate seal injection to affected RCP: V-300A for RCP A
	 V-300B for RCP B 2) Ensure HCV-142 open. demand at 0%.
 b. Align charging pump suction to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED 	 b. <u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch A0 to locally open V-358, manual charging pump suction from RWST (charging pump room). <u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following: 1) Direct A0 to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 3) <u>WHEN</u> V-358 open. <u>THEN</u> direct A0 to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
 c. Start charging pumps as necessary (75 kw each) and establish 75 gpm total charging flow Charging line flow Seal injection flow 	

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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D]
	tablish Condenser Steam mp Pressure Control:		
а.	Verify condenser available:	a. Place S/G ARV contr	
	o Any MSIV - OPEN	AUTO at desired pro to Step 5.	essure and go
	o Annunciator G-15, STEAM DUMP ARMED - LIT		
b.	Adjust condenser steam dump controller HC-484 to desired pressure and verify in AUTO		
c.	Place steam dump mode selector switch to MANUAL		
<u>NOTE</u> :	TDAFW pump flow control AOVs may	drift open on loss of IA.	
* 5 Moi	nitor Intact S/G Levels:		
а.	Narrow range level - GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed than 200 gpm until level greater than adverse CNMT] in at S/G.	narrow range 7% [25%
b.	Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. <u>IF</u> narrow range lev continues to increa uncontrolled manner RCS cooldown and go STEAM GENERATOR TUR Step 1.	se in an , <u>THEN</u> stop) to E-3,

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STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	٦
	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
* * * * * *	••••••••••••••••••••••••••••••••••••••	• • • • • • • • • • • • • • • • • • •	* * * * * * * *
	RS SHOULD NOT BE ENERGIZED Commended by TSC To ensure 1	UNTIL PRZR LEVEL INDICATES G HEATERS ARE COVERED.	REATER THAN
* * * * * *	* * * * * * * * * * * * *	* * * * * * * * * * * * * *	* * * * * * *
	gize PRZR Heaters		
	e PRZR proportional heaters ULL STOP		
b. Plac	e PRZR backup heaters in OF	F	
mini: leve	ult TSC for a recommended mum indicated PRZR water l that will ensure heaters covered	-	
	down margin should be monit 2.0, FIGURE SDM).	ored during RCS cooldown (Re:	fer to
7 Initia Shutdow	te RCS Cooldown To Cold wn:	1	
rate	blish and maintain cooldown in RCS cold legs - LESS 100°F/HE		
b. Uze 1	RHR system 11 in service		
	steam to condenser from ct S/G(s)	c. Manually or locally using intact S/Gs AM	
			•

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ES-1.2	POST LOCA COOLDOWN AND	DEPRESSURIZATION	PAGE 8 of 2
			····
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
Cor 0° F	ck RCS Subcooling Based On re Exit T/Cs - GREATER THAN VUSING FIG-1.0, FIGURE SUBCOOLING	Manually start SI pumps necessary and go to Ste	
9 Che	ck SI and RHR Pump Status:	Go to Step 15.	
o	SI pumps - ANY RUNNING		
	- OR -		
	RHR pumps - ANY RUNNING IN INJECTION MODE		

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STE	P ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* *	• • • • • • • • • • • • • • • • • • •	TION
	E UPPER HEAD REGION MAY VOID DURING NNING. THIS WILL RESULT IN A RAPIN	G RCS DEPRESSURIZATION IF RCPS ARE NOT DLY INCREASING PRZR LEVEL.
* *		
<u>NOT</u>	<u>E:</u> o <u>WHEN</u> using a PRZR PORV, <u>THEN</u> valve.	\underline{N} select one with an operable block
		e. spray flow may be increased by ve AOV-294 and normal PRZR spray valves.
10	Depressurize RCS To Refill PRZR:	
	a. Depressurize ucing normal PRZR spray if available	a. Depressurize using one PRZR PORV. <u>IF</u> IA <u>NOT</u> available. <u>THEN</u> refer to ATT-12.0. ATTACHMENT N2 PORVS.
		<u>IF</u> no PORV available. <u>THEN</u> use auxiliary spray valve (AOV-296).
	b. PRZR level - GREATER THAN 20% [40% adverse CNMT]	b. Continue with Step 11. <u>WHEN</u> level greater than 20% [40% adverse CNMT]. <u>THEN</u> stop RCS depressurization.
	c. Stop RCS depressurization	
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	DECRONCE NOT OPTIMITIED
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	* * * * * * * * * * * * * * * * * * * *
CAUTI	<u>ON</u>
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN	LOST THEN THE AFFECTED RCP SHOULD
NOT BE STARTED PRIOR TO A STATUS EVALUA	
11 Check If An RCP Should Be Started:	
a. Both RCPs – STOPPED	a. Stop all but one RCP and go to Step 12.
b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	b. Go to Step 19.
c. PRZR level - GREATER THAN 20% [40% adverse CNMT]	c. Return to Step 10.
d. Try to start an RCP	d. Ensure at least one control rod shroud fan running (45 kw each).
 Establish conditions for starting an RCP 	
o Buz 11A or 11B energized	
o Refer to ATT-15.0. ATTACHMENT RCP START	
2) Start one RCP	

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2 Check If One Of Three SI Pumps Should Be Stopped:	
a. Three SI pumps – RUNNING	a. Go to Step 13.
b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIG-1.0, FIGURE MIN SUBCOOLING	b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service. <u>THEN</u> go to Step 19.
	<u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT]. <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 12c. <u>IF</u> no RHR pump can be started in injection mode. <u>THEN</u> go to Step 19.
c. Check PRZR level – GREATER THAN 20% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 10.
d. Stop one Sl pump	

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EP ACTION/E	XPECTED RESPONSE	RESPONSE NOT OBTAINED
Check If One Should Be St	of Two SI Pumps opped:	
a. Two SI pump	s - RUNNING	a. Go to Step 14.
b. Determine r subcooling	equired RCS from table:	
Charging Pump Availability	RCS Subcooling C	riteria
NONE	120°F [200°F adve	erse CNMT]
ONE	115°F [190°F adve	erse CNMT]
TWO	105°F [180°F adve	erse CNMT]
THREE	100°F [175°F adve	rse CNMT]
exit T/Cs -	ing based on core GREATER THAN VALUE ABOVE USING FIG-1.0. SUBCOOLING	 c. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 19. <u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 13d. <u>IF</u> no RHR pump can be started in injection mode. <u>THEN</u> go to Step 19.
d. PRZR level [40% advers	- GREATER THAN 20% e CNMT]	d. Do <u>NOT</u> stop SI pump. Return to Step 10.

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EOP:		T LOCA COOLDOWN AND	D DEPRESSURIZATION	REV: 27 PAGE 13 of 2
_[STEP ACTION/EX	PECTED RESPONSE	RESPONSE NOT OBTAIN	IED
	Be Stopped:	t SI Pump Should		
	a. One SI pump	- RUNNING	a. <u>IF</u> any RHR pump r injection mode, <u>T</u> Step 19. <u>IF NOT</u> . Step 15.	<u>HEN</u> go to
	b. Determine r subcooling			
	Charging Pump Availability	RCS Subcooling C	riteria	
	NONE	Insufficient subco stop SI pump.	oling to	
	ONE	255°F [295°F adver	se CNMT]	
	TWO	235°F [285°F adver	se CNMT]	
	THREE	210°F [2/0°F adver	se CNMT]	
	exit T/Cs -	ing based on core GREATER THAN VALUE ABOVE USING FIG-1.0. SUBCOOLING	c. <u>IF</u> RCS hot leg te greater than 320° adverse CNMT] <u>OR</u> cooling in servic Step 19.	F [310°F <u>IF</u> RHR normal
			<u>IF</u> RHR normal coo service <u>AND</u> RCS h temperatures less [310°F adverse CN ensure at least o running in inject to Step 14d. <u>IF</u> be started in inj <u>THEN</u> go to Step 1	ot leg than 320°F MT], <u>THEN</u> ne RHR pump ion mode and go no RHR ⁻ pump can ection mode.
	d. PRZR level [40% advers	- GREATER THAN 20% e CNMT]	d. Do <u>NOT</u> stop SI pu Step 10.	mp. Return to
	e. Stop runnin	g Sl pump		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Be	eck If Charging Flow Should Controlled To Maintain CR Level:	
а.	Check RHR pumps - RUNNING IN INJECTION MODE	a. Start charging pump and control charging flow to maintain PRZR level and go to Step 16.
b.	Go to Step 19	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION	
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN I NOT BE STARTED PRIOR TO A STATUS EVALUATI	
	* * * * * * * * * * * * * * * * * * * *
16 Check RCP Status:	
a. Both RCPs – STOPPED	a. Stop all but one RCP and go to Step 17.
b. Check RVLIS level (no RCPs) – ≥ 95%	b. <u>IF</u> RVLIS level (no RCPs) less than 95%. <u>THEN</u> perform the following:
	o Increase PRZR level to greater than 65% [82% adverse CNMT].
	o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE <u>MIN</u> SUBCOOLING.
	o <u>WHEN</u> PRZR level indicates greater than minimum recommended by TSC. <u>THEN</u> energize PRZR heaters as necessary to saturate PRZR water.
	<u>lF</u> conditions <u>NOT</u> met, <u>THEN</u> continue with Step 17. <u>WHEN</u> conditions met, <u>THEN</u> do Steps l6c and d.

This Step continued on the next page.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 16 continued from previous page	e)
c. Establish conditions for starting an RCP:	c. <u>IF</u> conditions can <u>NOT</u> be met, <u>THEN</u> perform the following:
 Ensure Bus 11A or 11B energized. Refer to ATT-15.0, ATTACHMENT RCP START. 	 Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). <u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam. Co to Step 17
d. Start one RCP	 2) Go to Step 17. d. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	<u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam.

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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
	<u>CAUTION</u>
	 THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.
	 IF SI HAS BEEN TERMINATED, THE ACCUMS SHOULD BE ISOLATED PRIOR TO DEPRESSURIZING THE RCS TO LESS THAN 1000 PSIG. (REFER TO STEP 20).
:	<u>NOTE</u> : o <u>WHEN</u> using a PRZR PORV. <u>THEN</u> select one with an operable block valve.
	o If auxiliary spray is in use. spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.
	17 Depressurize RCS To Minimize RCS Subcooling:
	a. Depressurize using normal PRZR spray if available MOT available. <u>NOT</u> available, <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
	<u>IF</u> no PRZR PORV available. <u>THEN</u> use auxiliary spray valve (AOV-296).
	b. <u>WHEN</u> PRZR level indicates greater than minimum recommended by TSC. <u>THEN</u> energize PRZR heaters as necessary
	c. Depressurize RCS until EITHER of the following conditions satisfied:
	o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0. FIGURE MIN SUBCOOLING
	- OR -
	o PRZR level - GREATER THAN 75% [65% adverge CNMT]

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POST LOCA COOLDOWN AND DEPRESSURIZATION

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STEP -	ACTION/EXPECTED RESPONSE	_	RESPONSE NOT OBTAINED
18 Ver Mar	ify Adequate Shutdown gin		
	Direct RP to sample RCS for boron concentration		
(Verify boron concentration – GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM		b. Borate as necessary.
	itor SI Reinitiation teria:		
1	RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING		a. Manually start SI pumps as necessary and go to Step 20.
	PRZR level – GREATER THAN 10% [30% adverse CNMT]		b. Manually start SI pumps as necessary and return to Step 10.

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.

20 Check If SI ACCUMs Should Be Isolated:	
 a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN 	a. <u>IF</u> both RCS hot leg temperatures less than 400°F. <u>THEN</u> go to Step 20c.
SUBCOOLING	<u>IF NOT, THEN</u> go to Step 21.
b. PRZR level – GREATER THAN 10% [30% adverse CNMT]	b. Return to Step 10.
c. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
d. Close SI ACCUM discharge valves	d. Vent any unisolated ACCUMs:
 ACCUM A. MOV-841 ACCUM B. MOV-865 	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.
e. Locally reopen breakers for MOV-841 and MOV-865	

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a. Verify AC emergency busses a. Try to restore offsite power	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 energized by offsite power: (Refer to ER-ELEC.1. RESTORATIO OF OFFSITE POWER). Emergency D/G output breakers - OPEN AC emergency bus voltage - GREATER THAN 420 VOLTS AC emergency bus normal feed breakers - CLOSED Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1. ATTACHMENT D/G STOP) 	21 Check If Emergency D/Gs Should Be Stopped:	
 Emergency D/G output breakers OPEN AC emergency bus voltage - GREATER THAN 420 VOLTS AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP) 		(Refer to ER-ELEC.1, RESTORATION
 GREATER THAN 420 VOLTS AC emergency bus normal feed breakers - CLOSED Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1. ATTACHMENT D/G STOP) 	o Emergency D/G output breakers - OPEN	
breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)		
and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)		
	and place in standby (Refer to	
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22 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	a. Manually start pumps as power . supply permits (257 kw per . pump). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	 <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling <u>AND</u> immediately depress VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
	3) Go to Step 23.
b. Verify AUX BLDG SW isolation valves - OPER	b. Manually align valves.
 MOV-4615 and MOV-4/34 MOV-4616 and MOV-4/35 	

This Step continued on the next page

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c. Verify CNMT RECIF annunciator C-2. TEMPERATURE ALARM	HIGH	1) De [.]	rm the following: termine required SW flow to W HXs per table:
	SW DISCHARGE ALIGNMENT	CCW HXS IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HX
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30-33" d/p across each HX
	Alternate	1	95-100" d/p across in-service HX
			rect AO to adjust SW flow required value.
		o	<u>IF</u> on normal SW discharge:
			 V-4619. CCW Hx A V-4620. CCW Hx B
			-OR-
		0	<u>IF</u> on alternate SW discharge:
			 V-4619C. CCW Hx A V-4620B. CCW Hx B

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23 Check RCP Cooling a. Check CCW to RCPs	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).
o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED	
b. Check RCP seal injection	
o Labyrinth seal D/Ps - GREATER THAN 15 INCHES WATER	
- OR -	
o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	
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EP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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Check If Seal Return Flow Should Be Established:	
a. Verify instrument bus D – ENERGIZED	a. Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 25.
c. Verify RCP seal outlet valves - OPEN	c. Manually open valves as necessary.
 AOV-270A AOV-270B 	
d. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e. Open RCP seal return isolation valve MOV-313	e. Perform the following:
	1) Place MOV-313 switch to OPEN.
	 Dispatch AO to locally open MOV-313.
f. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following:
	1) Trip the affected RCP
	 Allow 4 minutes for pump coast down. <u>THEN</u> close the affected RCP seal discharge valve.
	• RCP A, AOV-270A • RCP B, AOV-270B
	<u>IF</u> both RCP seal discharge valves are shut. <u>THEN</u> go to Step 25.
g. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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<u>NOTE</u> :	Adverse CNMT conditions or loss of failure of NIS detectors.	forc	ed air cooling may result in
	eck If Source Range tectors Should Be Energized:		•
a.	Source range channels - DEENERGIZED	а.	Go to Step 25e.
ь.	Check intermediate range flux - EITHER CHANNEL LESS THAN	b.	Perform the following:
	10-10 AMPS		 <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration.
			 Continue with Step 26. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel. <u>THEN</u> do Steps 25c, d and e.
с.	Check the following:	c.	Continue with Step 26. <u>WHEN</u> either condition met. <u>THEN</u> do
	o Both intermediate range channels - LESS THAN 10-10 AMPS		Steps 25d and e.
	- OR -		
	o Greater than 20 minutes since reactor trip		
d .	Verify source range detectors ENERGIZED	d.	Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).
			<u>IF</u> cource ranges can <u>NOT</u> be restored. <u>THEN</u> refer to ER-NIS.1. SR MALFUNCTION and go to Step 25.
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel		

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	26 Establish Normal Shutdown Alignment:	
	a. Check condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1. ATTACHMENT SD-2.
	b. Perform the following:	
	o Open generator disconnects	
	• 1G13A71 • 9X13A73	
	o Place voltage regulator to OFF	
	o Open turbine drain valves	
	o Rotate reheater steam supply controller cam to close valves	
\smile	o Place reheater dump valve switches to HAND	
	o Stop all but one condensate pump	
	c. Verify adequate Rx head cooling:	
	1) Verify at least one control rod shroud fan - RUNNING	l) Manually start one fan as power súpply permits (45 kw)
	2) Verify one Rx compartment cooling fan - RUNNING	2) Perform the following:
		o Dispatch AO to reset UV relays at MCC C and MCC D.
		o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0. ATTACHMENT SD-1 - COMPLETE	
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27 Moni	tor RCP Operation:	
a.R	CPs - ANY RUNNING	a. Go to Step 28.
Ъ. C	heck the following:	b. Stop affected RCP(s).
0	RCP #1 seal D/P - GREATER THAN 220 PSID	
o	RCP #1 seal leakoff - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0. FIGURE RCP SEAL LEAKOFF	
Avai	k Condenser Steam Dump lable - CONDENSER VACUUM ATER THAN 20 INCHES HG	Use intact S/G ARV for RCS temperature control.
	k If RHR Normal Cooling Be Established:	
	CS cold leg temperature - LESS HAN 350°F	a. Go to Step 30.
	CS pressure - LESS THAN 00 psig [300 psig adverse CNMT]	b. Go to Step 30.
Р (О	lace RCS overpressure rotection system in service Refer to 0 7. ALIGNMENT AND PERATION OF THE REACTOR VESSEL VERPRESSURE PROTECTION SYSTEM	
n e	onsult TSC to determine if EHF ormal cooling should be stablished using ATT-14.1 TTACHMENT RHR COOL	

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POST LOCA COOLDOWN AND DEPRESSURIZATION

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: This procedure should be continued sample in Step 30.	l while obtaining CNMT hydrogen
30 Check CNMT Hydrogen Concentration:	
a. Direct RP to start CNMT hydrogen monitors as necessary	
b. Hydrogen concentration - LESS THAN 0.5%	b. Consult TSC to determine if hydrogen recombiners should be placed in service.
31 Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 1.
32 Evaluate Long Term Plant Status:	
a. Maintain cold shutdown conditions	
b. Consult TSC	
- F	end -

EOP:

ES-1.2 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT SEAL COOLING (ATT-15.2)
- 6) ATTACHMENT RCP START (ATT-15.0)
- 7) ATTACHMENT NC (ATT-13.0)
- ATTACHMENT D/G STOP (ATT-8.1) 8)
- 9) ATTACHMENT SD-1 (ATT-17.0)
- 10) ATTACHMENT SD-2 (ATT-17.1)
- 11) ATTACHMENT SI/UV (ATT-8.4)
- 12) ATTACHMENT N2 PORVS (ATT-12.0)
- 13) ATTACHMENT RHR COOL (ATT-14.1)
- 14) ATTACHMENT NO SW PUMPS (ATT 2.4)
- 15) FOLDOUT

	<u> </u>	•
EOP:		REV: 27
ES-1.2	POST LOCA COOLDOWN AND DEPRESSURIZATION	PAGE 1 of 1
	RED PATH SUMMARY	
a. SUE	CRITICALITY - Nuclear power greater than 5%	
b. COF	E COOLING - Core exit T/Cs greater than 1200°F -OR-	
	Core exit T/Cs greater than 700°F <u>AN</u> RVLIS level (no RCPs) less than 52% adverse CNMT]	
c. HEA	T SINK - Narrow range level in all S/Gs less that [25% adverse CNMT] <u>AND</u> total feedwater less than 200 gpm	
- TNI	ECDIMY . Cold log temperatures decrease greater	4.1

- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

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6. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

7. E-3 TRANSITION CRITERIA

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<u>IF</u> any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation, <u>THEN</u> manually start SI Pumps as necessary, stop RCS cooldown <u>AND</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

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GINNA STATION CONTROLLED COPY NUMBER ______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

.

REVIEWED BY:_____

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- A. PURPOSE This procedure provides the necessary instructions for transferring the Safety Injection system and Containment Spray system to recirculation modes of operation.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure may be entered from:
 - a. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, or,
 - b. ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, or,
 - c. ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS, or,
 - d. FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, or,
 - e. FR-C.2, RESPONSE TO DEGRADED CORE COOLING, or,
 - f. FR-C.3, RESPONSE TO SATURATED CORE COOLING, or,
 - g. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, or,
 - h. FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE, on low RWST level.
 - i. Other procedures whenever RWST level reaches the switchover setpoint (28%).

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TRANSFER TO COLD LEG RECIRCULATION

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTIO	<u>N</u>
	 IF OFFSITE POWER IS LOST AFTER SI RES REQUIRED TO RESTART SAFEGUARDS EQUIPM LOSS OF OFFSITE POWER) 	
	 CONSULT WITH RADIATION PROTECTION BEF AUXILIARY BUILDING. SWITCHOVER TO RE LEVELS. 	
	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
	<u>NOTE</u> : o FOLDOUT page should be open and	monitored periodically.
	o Adverse CNMT values should be u greater than 4 psig or CNMT rad	sed whenever CNMT pressure is iation is greater than 10 ⁺⁰⁵ R/hr.
\bigcirc	* 1 Verify RWST level - GREATER THAN 15%	<u>IF</u> sump recirculation <u>NOT</u> in progress, <u>THEN</u> pull-stop all pumps taking suction from RWST. <u>EXCEPT</u> one SI pump <u>AND</u> go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	2 Verify CNMT Sump B Level - AT LEAST 113 INCHES	<u>IF</u> RWST level is less than 28% <u>AND</u> CNMT sump B level is less than 113 inches. <u>THEN</u> go to ECA-1.2. LOCA OUTSIDE CONTAINMENT. Step 1.
	<u>NOTE</u> : Steps 3 through 13 should be perfo should not be implemented prior to	
	3 Reset SI	
\bigcirc		

P: TILE: ES-1.3 TRANSFER TO COLD LE	REV: 37
	PAGE 4 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : IF D/Gs supplying emergency AC bus be shed as necessary to allow star	
4 Establish Adequate SW Flow:	
a. Verify at least two SW pumps – RUNNING	a. Start additional SW pumps as power supply permits (257 kw each). <u>IF</u> only 1 SW pump operable. <u>THEN</u> perform the following:
	 Ensure SW aligned to one CCW Hx per ATT-2.1, ATTACHMENT MIN SW.
	2) Go to Step 5.
	<u>IF</u> no SW pumps are available. <u>THEN</u> perform the following:
	 Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
b. Verify AUX BLUG SW isolation valves - OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	
c. Dispatch AO to Check BOTH CCW lixs - IN SERVICE	Locally place BOTH CCW Hxc in service
· · · ·	
This Stop continued on the same	
This Step continued on the next page.	

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TRANSFER TO COLD LEG RECIRCULATION

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	STEP ACTION/EXPECTED	RESPONSE	RESPONSE NOT OBTAINED				
	(Step 4 continued from previous page)						
	d. Determine required SW flow to CCW HXs per table:						
	oow mas per table.						
	SW DISCHARGE ALIGNMENT	CCW HX: IN SERVICE	REQUIRED SW FLOW				
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs				
	Normal	1	5000 - 6000 gpm to in-service HX				
	Alternate	2	30–33" d/p across each HX				
	Alternate	1	95–100" d/p across in-service HX				
	e. Direct AO to adjust required value o <u>IF</u> on normal SW • V-4619. CCW H • V-4620. CCW H · OR- o <u>IF</u> on alternate • V-4619C. CCW H • V-4620B. CCW H	discharge: X A X B SW discharge HX A	 2) Direct AO to local SW flow to require 3) Direct AO to local SW return from SFP • SFP Hx A (V-4622 alternate SW dis V-4622A) • SFP Hx B (V-8689) 4) Verify SW portions ATT-17.0, ATTACHME 	form the enhouse and eaders. 0 - AT 3 - AT ly adjust d value. ly isolate Hxs:) (for charge use) of			
\bigcirc			complete.				

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EOP: TITLE: ES-1.3 TRANSFER TO COLD LEG	REV: 37
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Establish CCW flow to RHR Hxs:	
a. Check both CCW pumps - RUNNING	a. Perform the following:
	 Start CCW pumps as power supply permits (122 kw each).
	2) <u>IF</u> both CCW pumps are running, <u>THEN</u> go to step 5b.
	3) <u>IF</u> only one CCW pump is running, <u>THEN</u> perform the following:
	a) Direct AO to isolate CCW to boric acid evaporator
	o Close V-760A
	b) Manually open CCW MOV to only one operable RHR loop.
	o Open MOV-738A
	- OR -
	o Open MOV-738B
	c) Go to step 6.
 b. Open CCW valves to RHR Hxs MOV-738A MOV-738B 	b. Dispatch AO to locally open valves.

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ES-1.3	TILE:	LEG RECIRCULATION	37
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STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
* * * * * *	• • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * *	* * * *
	<u>CAU</u>	TION	
	HX OUTLET VALVES (HCV-624) ENT AIR PRESSURE.	AND HCV-625) WILL FAIL OPEN ON LOSS	OF
		BEFORE DISPATCHING PERSONNEL TO RECIRCULATION MAY CAUSE HIGH RADIA	TION
* * * * * *	* * * * * * * * * * * * *	* * * * * * * * * * * * * * * * *	* * * *
6 Check l	RHR Flow:	Manually adjust RHR Hx outlet valves equally to reduce flow	
	Elow - LESS THAN 1500 GPM DPERATING PUMP	less than 1500 gpm per operat: pump	
		• RHR Hx A, HCV-625 • RHR Hx B, HCV-624	
		<u>IF</u> flow can <u>NOT</u> be reduced manually, <u>THEN</u> dispatch an AO locked valve key to locally a RHR Hx outlet valve handwheel equally to reduce flow.	djust

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TRANSFER TO COLD LEG RECIRCULATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
SIEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7 Check IF Unnecessary Pumps Can Be Stopped:	
a. Three SI pumps – RUNNING	a. Go to Step 7c
 b. Stop SI pump C and place both switches in PULL STOP 	
c. Stop both RHR pumps and place in PULL STOP	
d. Both CNMT spray למויס - RUNNING	d. Pull stop any idle CNMT spray pump and go to Step 7f.
e. Pull stop one CNMT spray pump	
f. Check CNMT pressure - LESS THAN 28 PSIG.	f. Go to Step 8.
g. Place NaOH Tank outlet valve switches to OPEN.	
• AOV-836A • AOV-836B	
h. Reset CNMT spray	
1. Close discharge valves for idle CNMT spray pump(s)	
o Pump A	
MOV-860AMOV-860B	
o Pump B	·
MOV-860CMOV-860D	

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•			PAGE 9 of 22
\bigcirc	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
	8 Verify RHR System Alignment:		
	a. Verify the following valves - CLOSED	a. Ensure at least one valve and one disch closed.	
	o RHR suction valves from loop A hot leg		
	MOV-700MOV-701		
	o RHR discharge valves to loop B cold leg		
	• MOV-720 • MOV-721		
	b. Verify RHR pump suction crosstie valves - OPEN	b. Manually open valve can <u>NOT</u> be opened, j AO to locally open	<u>THEN</u> dispatch
\bigcup	 MOV-704A MOV-704B 	no to rotarry open	
	c. Verify the following valves - OPEN	c. Ensure at least one each set open.	valve in
	o RHR pump discharge to Rx vessel deluge valves		
	• MOV-852A • MOV-852B	•	
	o RHR suction from sump B (inside CNMT)		
	• MOV-851A • MOV-851B		
	d. Verify RCDT pump suction valves from sump B - CLOSED	d. Manually close valv	es.
	• MOV-1813A • MOV-1813B		
\bigcirc			

G RECIRCULATION REV: 37 PAGE 10 of RESPONSE NOT OBTAINED N IMITED TO 1500 GPM PER OPERATING PUMP ••••••••••••••••••••••••••••••••••••
RESPONSE NOT OBTAINED N IMITED TO 1500 GPM PER OPERATING PUMP a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
N IMITED TO 1500 GPM PER OPERATING PUMP a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
N IMITED TO 1500 GPM PER OPERATING PUMP a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
 IMITED TO 1500 GPM PER OPERATING PUMP a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
 IMITED TO 1500 GPM PER OPERATING PUMP a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
 a. Dispatch AO to locally close valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
valve and continue with Step 9b. b. <u>IF</u> only one valve will open.
b. <u>IF</u> only one valve will open.
I I I I I I I I I I I I I I I I I
1) Initiate only one train of RHR recirculation (Refer to
ATT-14.3, ATTACHMENT RHR NPSH for further guidance).
2) Go to step 9e.
IF neither valve will open. THEN
refer to ATT-14.6, ATTACHMENT RHR PRESS REDUCTION for further guidance.
c. Perform the following:
1) <u>IF</u> MOV-738A open. <u>THEN</u> start RHR Pump A and go to step 9e.
2) <u>IF</u> MOV-738B open. <u>THEN</u> start RHR Pump B and go to step 9e.
e. <u>IF</u> no RHR pump can be started. <u>THEN</u> go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

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TRANSFER TO COLD LEG RECIRCULATION

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1	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED
	CAUTION
	SUMP RECIRCULATION FLOW TO RCS MUST BE MAINTAINED AT ALL TIMES, EXCEPT DURING
	ALIGNMENT FOR HIGH HEAD RECIRCULATION.
	* * * * * * * * * * * * * * * * * * * *
	<u>NOTE</u> : The TSC should be requested to establish periodic monitoring of the AUX BLDG sub-basement, as radiological conditions permit, to monitor RHR pump operation.
	10 Check RWST Level - LESS THAND0 NOT continue with this procedure15%until RWST level is less than 15%.
	11 Stop All Pumps Supplied From RWST:
\bigcirc	a. Stop all SI pumps and place in PULL STOP
	b. Stop all charging pumps
	c. Stop operating CNMT spray pump and place in PULL STOP
	d. Check CNMT pressure – LESS THAN d. Go to Step 12. 28 PSIG
	e. Reset CNMT spray if necessary
	f. Close CHMT spray pump discharge valves
	 MOV-860A MOV-860B MOV-860C MOV-860D
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OP:			REV: 37
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<u> </u>			
STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED)
		L	
* * * * * *	CAUTIO	<u>N</u>	* * * * * * * *
	UST BE MAINTAINED LESS THAN 15 BY THE TOTAL OF FI-931A, FI-9		
* * * * * *	* * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * .* *
	SI And CNMT Spray For ecirculation:		
	fy SI pump suction valves BASTs - CLOSED	a. Ensure at least one each flowpath close	
	V-826A and MOV-826B V-826C and MOV-826D		
and	e RWST outlet valves to SI CNMT spray pumps (turn on DC r key switches)	b. Ensure at least one	valve closed.
	V-896A V-896B		
c. Clos	e SI pump RECIRC valves	c. Ensure at least one	valve closed.
	V-898 V-897		
	fy SI pump suction valves RWST - OPEN	d. Ensure at least one	valve open.
	V-825A V-825B		
path	n operating RHR pump flow (s) to SI and CNMT spray suction.	e. Ensure at least one aligned from RHR pu and CS pump suction (Refer to ATT-14.5.	mp(s) to SL header
<u>T</u> .	<u>F</u> RHR Pump A operating. <u>HEN</u> open MOV-857A and DV-857C	RHR SYSTEM). <u>IF</u> neither flow pat	h can be
	E RHR Pump B operating.	aligned, <u>THEN</u> refer ATTACHMENT RHR PRES	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	* * * * * * * * * * * * * * * * * *
CAUTIO	_
SI PUMPS SHOULD BE STOPPED IF RCS PRESSU PRESSURE.	RE IS GREATER THAN THEIR SHUTOFF HEAD
	* * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : Operation of SI pump C is preferre	d since it delivers-to both RCS
loops.	
13 Verify Adequate RCS Makeup	
Flow:	
a. RCS pressure – LESS THAN 225 psig [425 psig adverse CNMT]	a. Perform the following:
	1) Check RCS conditions:
	o RCS subcooling based on core exit T/Cs greater than FIG-1.0. FIGURE MIN SUBCOOLING.
	o PRZR level greater than 10% [30% adverse CNMT].
	<u>IF</u> either condition <u>NOT</u> met. <u>THEN</u> start one SI pump.
	2) Go to Step 14.
b. RHR injection flow adequate:	b. Start one SI pump.
o Core exit T/Cs - LESS THAN REQUIREMENTS OF FIG-5.0. FIGURE RHR INJECTION	
o Check RVLIS level (no RCPS) – GREATER THAN 52% [55% adverse CNMT]	(

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TRANSFER TO COLD LEG RECIRCULATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
CAUTION	* * * * * * * * * * * * * * * * * * * *				
	IF A CNMT SPRAY PUMP IS STARTED. THEN CNMT PRESSURE SHOULD BE CLOSELY MONITORED. CNMT PRESSURE SHOULD NOT BE REDUCED TO LESS THAN 22 PSIG.				
<pre>*14 Check If CNMT Spray Is Required:</pre>					
a. CNMT pressure - GREATER THAN	a. Perform the following:				
28 PSIG	 <u>IF</u> CNMT spray previously actuated and NaOH tank level greater than 55%. <u>THEN</u> consult TSC to determine if CNMT spray should be restarted. 				
	2) Go to Step 15.				
b. Verify CNMT spray pump discharge valves - OPEN	b. Manually open valve(s) for selected pump.				
 MOV-860A MOV-860B MOV-860C MOV-860D 	 CS pump A. MOV-860A or MOV-860B CS pump B. MOV-860C or MOV-860D 				
c. Start selected CNMT spray pump	c. <u>IF</u> the selected CNMT spray pump will not start. <u>THEN</u> align and start the other CNMT spray pump. <u>IF</u> neither pump will start. <u>THEN</u> continue with Step 15. <u>WHEN</u> a CNMT spray pump can be started. <u>THEN</u> do steps 14d, e and f.				
d. Adjust RHR flow to maintain less than 1500 gpm per operating RHR pump as indicated by the total of FI-931A. FI-931B and FI-626 indications.					
This Step continued on the next page.					

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			ı
STEP ACTION/EXPECTED F	ESPONSE	RESPONSE NOT OBTAINED	
(Step 14 continued fro	om previous page)	
e. Verify NaOH flow (F	I-930)	e. <u>IF</u> NaOH flow <u>NOT</u> ind place switches for N outlet valves to OPE	aOH tank
		AOV-836AAOV-836B	
f. <u>WHEN</u> CNMT pressure 22 psig, <u>THEN</u> perf following:			
1) Reset CNMT spray			
2) Check NaOH flow FLOW	(FI-930) - NO	2) Place NaOH tank o switches to close	
		AOV-836AAOV-836B	
3) Stop CNMT spray place in PULL ST			
4) Close CNMT spray discharge valves			
 MOV-860A MOV-860B MOV-860C MOV-860D 			
15 Verify Adequate Cor	-	<u>IF</u> both RHR pumps runni ensure two SI pumps run	
o Core exit T/Cs - ST DECREASING	ABLE OR	<u>IF</u> only one RHR pump ru perform the following:	nning, <u>THEN</u>
OR INCREASING	ε) - STABLE	a. Ensure one SI_pump_r	cunning.
o RVLIS level (no RCP THAN 52% [55% adver		b. <u>WHEN</u> CNMT spray pump <u>THEN</u> start one addit pump.	

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TRANSFER TO COLD LEG RECIRCULATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 *16 Monitor Indications Of CNMT Sump B Blockage Check running RHR Pump motor current - STABLE RHR Pump A. PPCS point I0685AD RHR Pump B. PPCS point I0685BD Check running RHR pump discharge flows - STABLE NOTE: TDAFW pump flow control AOVs may description: 	guidance.
a. Narrow range level - GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.
b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50%	۰ ـــ ۰۰

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Estab Align	lish Normal Shutdown ment:	
a. Che	eck condenser – AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
b. Per	form the following:	
ο	Open generator disconnects	
	• 1G13A71 • 9X13A73	
o	Place voltage regulator to OFF	
o	Open turbine drain valves	
	Rotate reheater steam supply controller cam to close valves	
o	Place reheater dump valve switches to HAND	
o	Stop all but one condensate pump	
c. Ver	ify adequate Rx head cooling:	
1)	Verify at least one control rod shroud fan – RUNNING	l) Manually start one fan as power supply permits (45 kw)
2)	Verify one Rx compartment cooling fan - RUNNING	2) Perform the following:
	cooling ran - kommo	o Dispatch AO to reset UV relays at MCC C and MCC D.
		o Manually start one fan as power supply permits (23 kw)

d. Verify ATT-1/.0. ATTACHMENT SD-1 - COMPLETE

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TRANSFER TO COLD LEG RECIRCULATION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19 Check If Emergency D/Gs Should Be Stopped:	
 a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers 	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
- OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS	
o AC emergency bus normal feed breakers – CLOSED	
b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	
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EOP: TITLE:	REV: 37
ES-1.3 TRANSFER TO COLD LE	G RECIRCULATION PAGE 19 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20 Check If SI ACCUMs Should Be Isolated:	
a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 21. <u>WHEN</u> both RCS hot leg temperatures less than 400°F. <u>THEN</u> do Steps 20b through d.
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:

 Open vent valves for unisolated SI ACCUMs.

- ACCUM A. AOV-834A
- ACCUM B, AOV-834B
- 2) Open HCV-945.

<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC to determine contingency actions. 22

d. Locally reopen breakers for MOV-841 and MOV-865

ACCUM A, MOV-841
ACCUM B, MOV-865

P: TITLE:	REV: 37
ES-1.3 TRANSFER TO COLD LEG	RECIRCULATION PAGE 20 of 2
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION	* * * * * * * * * * * * * * * * * * * *
IF FUEL DAMAGE IS SUSPECTED, MAINTAIN S/G PRESSURE.	PRESSURE SLIGHTLY GREATER THAN RCS
•.•••••	· · · · · · · · · · · · · · · · · · ·
21 Check If Intact S/Gs Should Be Depressurized To RCS Pressure:	
a. RCS pressure – LESS THAN INTACT S/G PRESSURES	a. Go to Step 22.
b. Direct RP to sample S/Gs for activity	
c. Request TSC perform a dose projection on steaming S/Gs	
d. Dose projection for each S/G - ACCEPTABLE	d. Do <u>NOT</u> dump steam from a S/G with an unacceptable dose projection.
e. Dump steam to condenser from intact S/G(s) until S/G pressure less than RCS pressure	e. <u>IF</u> steam dump to condenser <u>NOT</u> available. <u>THEN</u> dump steam using intact S/G ARVs until S/G pressure less than RCS pressure.
22 Consult TSC to Determine If Rx Vessel Head Should Be Vented	

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EOP:	_
ES-1.3	

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TRANSFER TO COLD LEG RECIRCULATION

- STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	AUTON/EXTECTED RESTONSE	RESTORSE NOT OBTRINED
<u>NOTE</u> :	This procedure should be continued sample in Step 23.	while obtaining CNMT hydrogen
	eck CNMT Hydrogen ncentration:	
а.	Direct RP to start CNMT hydrogen monitors as necessary	
b.	Hydrogen concentration - LESS THAN 0.5%	b. Consult TSC to determine if hydrogen recombiners should be placed in service.
NOTE:	The TSC should be consulted before	changing recirculation lineups.
GR	eck Event Duration EATER THAN 19 HOURS AFTER ENT INITIATION	Consult TSC to evaluate long term plant status.
25 Se	cure CNMT Spray	
a.	Reset CNMT spray	
b.	Place NaOH Tank outlet valve switches in AUTO	
	• AOV-836A • AOV-836B	
с.	Place CNMT spray pumps in PULL STOP	
d.	Close discharge valves for idle CNMT spray pumps	
	o Pump A	
	MOV-860AMOV-860B	
	o Pump B	
	• MOV-860C • MOV-860D	

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TRANSFER TO COLD LEG RECIRCULATION

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ST	EP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Verify Two SI Pumps - RUNNING	Manually start pumps.
27	Check Core Exit T/Cs - LESS THAN REQUIREMENTS OF FIG-5.0, FIGURE RHR INJECTION	 Perform the following: a. Manually open both PRZR PORVs and block valves. b. Verify core exit T/Cs decreasing to less than requirements of FIG-5.0, FIGURE RHR INJECTION. <u>IF NOT, THEN</u> dump steam from intact S/Gs until core exit T/Cs less than required.
28	Consult TSC To Evaluate Long Term Plant Status	ND -
		· ·

EOP:

PAGE 1 of 1

ES-1.3 APPENDIX LIST

TITLE

1) RED PATH SUMMARY

TITLE:

- 2) FIGURE RHR INJECTION (FIG-5.0)
- 3) FIGURE MIN SUBCOOLING (FIG-1.0)
- 4) FIGURE MIN RCS INJECTION (FIG-6.0)
- 5) ATTACHMENT D/G STOP (ATT-8.1)
- 6) ATTACHMENT SD-1 (ATT-17.0)
- 7) ATTACHMENT SD-2 (ATT-17.1)
- 8) ATTACHMENT RHR NPSH (ATT-14.3)
- 9) ATTACHMENT RHR SYSTEM (ATT-14.5)
- 10) ATTACHMENT MIN SW (ATT-2.1)
- 11) ATTACHMENT RHR PRESS REDUCTION (ATT-14.6)
- 12) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 13) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 14) FOLDOUT

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EOP:	TITLE:					REV:	37
ES-1.3		TRANSFER !	TO COLD	LEG RECII	RCULATION	PAGE	1 of
		£ .			1 N.		-

RED_PATH_SUMMARY

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- a. SUBCRITICALITY Nuclear power greater than 5%
- b. CORE COOLING Core exit T/Cs greater than 1200°F -OR-Core exit T/Cs greater than 700°F AND RVLIS level (no RCPs) less than 52% [55% adverse CNMT]
- c. HEAT SINK -- Narrow range level in all S/Gs less than 7% [25% adverse CNMT] <u>AND</u> total feedwater flow less than 200 gpm
- d. INTEGRITY Cold leg temperatures decrease greater than 100°F in last 60 minutes <u>AND</u> RCS cold leg temperature less than 285°F
- e. CONTAINMENT CNMT pressure greater than 60 psig

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TRANSFER TO COLD LEG RECIRCULATION

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FOLDOUT PAGE

1. ECA-1.1 TRANSITION CRITERIA

<u>IF</u> emergency coolant recirculation is established and subsequently lost, <u>THEN</u> go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

2. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pusbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
- c. Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.
- 3. AFW SUPPLY SWITCHOVER CRITERION

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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EOP:	TINE:	REV: 16
ES-3.1	POST-SGTR COOLDOWN USING BACKFILL	PAGE 1 of 11

GINNA STATION CONTROLLED COPY NUMBER 23

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RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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	ES-3.1		POST-SGTR	COOFDOMN	USING	BACKFILL	PAGE	2 of 11

A. PURPOSE - This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a SGTR. This recovery method depressurizes the ruptured S/G by draining it through the ruptured S/G tubes into the RCS.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects backfill method.
 - b. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, when blowdown is not available and plant staff selects backfill method.

		REV: 16
ES-3.1 POST-SGTR COOLDOWN	USING BACKFILL	PAGE 3 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
CAUTION	* * * * * * * * * * * * * *	* * * * * * * *
• INADVERTENT CRITICALITY MAY OCCUR FOLI IF THE RCP IN THE RUPTURED LOOP IS STA		DN COOLDOWN .
 IF RCP COOLING HAD PREVIOUSLY BEEN LOS BE STARTED PRIOR TO A STATUS EVALUATION 		SHOULD NOT
* * * * * * * * * * * * * * * * * * * *		* * * * * * * *
<u>NOTE</u> : o FOLDOUT page should be open AND	monitored periodically.	
o Adverse CNMT values should be us greater than 4 psig or CNMT radi		
* 1 Check RCP Status		
a. Both RCPs – STOPPED	a. Stop all but one RC Step 2.	CP and go to
b. Ensure conditions for starting . an RCP.	b. <u>IF</u> conditions can <u>N</u> <u>THEN</u> perform the fo	
o Bus 11A or 11B energized.	 Verify natural of (Refer to ATT-13) 	
 Refer to ATT-15.0, ATTACHMENT RCP START. 	ATTACHMENT NC).	
	<u>IF</u> natural circu <u>NOT</u> be verified, increase dumping	THEN
	2) Go to Step 2.	

This Step continued on the next page.

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ES-3.1	ES-3.1 POST-SGTR COOLDOWN USING BACKFILL		REV: 16	
				PAGE 4 of
	XPECTED RESPONSE	L	ESPONSE NOT OBTAINED]
-	nued from previous page		 <u>IF</u> RVLIS level (no F than 95%, <u>THEN</u> performed following: o Increase PRZR lever greater than 65% CNMT]. o Dump steam to est subcooling based T/Cs to greater the using FIG-1.0, FI SUBCOOLING. o Energize PRZR heat necessary to saturate water. 	orm the vel to [82% adverse tablish RCS on core exit than 20°F IGURE MIN
d. Start one F	CP	d.	<u>IF</u> conditions <u>NOT</u> me continue with Step 2 conditions met. <u>THEN</u> <u>IF</u> an RCP can <u>NOT</u> be <u>THEN</u> verify natural (Refer to ATT-13.0. NC). <u>IF</u> natural circulate be verified. <u>THEN</u> in dumping steam.	2. <u>WHEN</u> <u>1</u> do Step 1d. e started, circulation ATTACHMENT Lon can <u>NOT</u>
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TITLE:

POST-SGTR COOLDOWN USING BACKFILL

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
ACTION/EXTECTED RESPONSE	RESPONSE NOT OBTAINED
2 Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
3 Check If SI ACCUMs Should Be Isolated:	
a. Check the following:	a. Go to ECA-3.1, SGTR WITH LOSS OF
o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
o PRZR level - GREATER THAN 10% [30% adverse CNMT]	
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
c. Close SI ACCUM outlet valves	c. Vent any unisolated ACCUMs:
 ACCUM A. MOV-841 ACCUM B. MOV-865 	1) Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC to determine contingency actions.
d. Locally reopen breakers for MOV-841 and MOV-865	
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TITLE:

POST-SGTR COOLDOWN USING BACKFILL

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> :	Leakage from ruptured S/G into RC concentration.	CS will dilute RCS boron
	rify Adequate Shutdown rgin	
8.	Direct RP to sample RCS and ruptured S/G for boron concentration	
b.	Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Borate as necessary.
NOTE:	TDAFW pump flow control AOVs may	drift open on loss of IA.
* 5 Mo	nitor Intact S/G Level:	
а.	Narrow range level – GREATER THAN 7% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in the intact S/G.
Ь.	Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner. <u>THEN</u> go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.

EOP:	TITLE:		REV: 16
ES-3.1	POST-SGTR COOLI	POST-SGTR COOLDOWN USING BACKFILL	
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	₀
m		ue to depressurize to less the y for continued RCP operation, e delayed.	
	iate RCS Cooldown To Col down:	ld .	•••
r	stablish and maintain cooldow ate in RCS cold legs - LESS HAN 100°F/HR	vn	
Ь. U	se RHR system if in service		
	ump steam to condenser from ntact S/G	c. Manually or locally using intact S/G AF	
		<u>IF</u> no intact S/G av RHR system <u>NOT</u> in s perform the followi	ervice, <u>THEN</u>
		o Use faulted S/G.	
		- OR -	
		o Go to ECA-3.1. S OF REACTOR COOLA SUBCOOLED RECOVE Step 1.	NT -

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TITLE:

POST-SGTR COOLDOWN USING BACKFILL

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	* 7 Monitor Ruptured S/G Narrow Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow. <u>IF</u> any of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G:
		 Ruptured S/G pressure decreases in an uncontrolled manner.
		-OR-
		o Ruptured S/G pressure increases to 1020 psig.
		- OR -
\bigcirc		o Ruptured S/G pressure decreases to 350 psig <u>AND</u> ruptured S/G level greater than 7% [25% adverse CNMT].
	* 8 Control Charging And Letdown Flow To Maintain PRZR Level:	
	a. PRZR level – GREATER THAN 20% [40% adverse CNMT]	a. Increase charging flow as necessary and go to Step 9.
	b. PRZR level – LESS THAN 75% [65% adverse CNMT]	b. Decrease charging flow to decrease level and go to Step 11.
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EOP: TITLE: ES-3.1 POST-SGTR COOLDOW	N USING BACKFILL	REV: 16 PAGE 9 of 1
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
	<u>on</u>	* * * * * * * *
THE UPPER HEAD REGION MAY VOID DURING R RUNNING. THIS WILL RESULT IN A RAPIDLY		PS ARE NOT
NOTE: RCS depressurization may be stopp less than 400 psig [300 psig adve #1 seal D/P.		
* 9 Depressurize RCS To Backfill From Ruptured S/G:		
a. Depressurize using normal PRZR spray	a. <u>IF</u> letdown is in se depressurize using spray valve (AOV-29 <u>THEN</u> use one PRZR B	auxiliary 96). <u>IF NOT</u> ,
<pre>b. Maintain PRZR level - BETWEEN 20% AND 75% [BETWEEN 40% AND 65% . adverse CNMT]</pre>		
c. Check ruptured S/G level - GREATER THAN /% [25% adverse CNMT]	c. Stop RCS depressur	ization
d. Energize PRZP heaters as necessary		
e. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN O°F USING FIG 1.0. FIGURE MIN SUBCOOLING		

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POST-SGTR COOLDOWN USING BACKFILL

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ſ	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	10 Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 Or O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
	11 Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 12.
	b. RCS pressure – LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 12.
\smile	c. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
	d. Establish RHR normal cooling (Refer to ATT-14.1. ATTACHMENT RHR COOL)	
	*12 Monitor RCP Operation:	
	a. RCP: - ANY RUNNING	a. Go to Step 13.
	b. Check the following:	b. Stop affected RCP(s).
	o RCP #1 seal D/P - GREATER THAN 220 PSID	
	o Check RCP ceal leakage · WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0. FIGURE RCP SEAL LEAKOFF	
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I	ES-	3	•	1

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POST-SGTR COOLDOWN USING BACKFILL

PAGE 11 of 11

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 4.
14 Evaluate Long Term Plant Status:	
a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS)	
b. Consult TSC	
- E	END -
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EOP:

PAGE 1 of 1

ES-3.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY

TITLE:

- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT RCP START (ATT-15.0)
- 7) ATTACHMENT NC (ATT-13.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) FOLDOUT

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EOP:					DOUDI				REV	: 16
ES-3	•1	£	POST-SG		JOWN	USING	BACKE	ىلىل 1.	PAG	E 1 of 1
			<u>, , , , , , , , , , , , , , , , , , , </u>	RED	PATH	SUMMAF	<u>XY</u>		<u></u>	
а.	SUBCE	RITICALI	TY - N	uclear	power	great	cer th	an 5%		
b.	CORE	COOLING	Cor RVL	e exit	T/Cs el (no	-OR- greate	er tha	n 1200°; n 700°F than 5;	AND	• .
<u>с.</u>	HEAT	SINK -		dverse	CNMT]			s less feedwat		
d.	INTEC	GRITY -		in last	: 60 m	inutes	AND	e great RCS col		
e.	CONT	AINMENT	- CNMT	pressi	ıre gr	eater	than	60 psig		

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EOP:		REV: 16	
ES-3.1	POST-SGTR COOLDOWN USING BACKFILL	PAGE 1 of	1

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FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI REINITIATION CRITERIA</u>

Following SI termination, <u>IF</u> either condition listed below occurs, <u>THEN</u> start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

<u>OR</u>

- o PRZR level CHARGING CAN NOT CONTROL LEVEL GREATER THAN
 10% [30% adverse CNMT].
- 3. <u>SECONDARY_INTEGRITY_CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. <u>AFW SUPPLY SWITCHOVER CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

5. <u>MULTIPLE S/G TUBE RUPTURE CRITERIA</u>

<u>IF</u> any intact S/G level increases in in an uncontrolled manner <u>OR IF</u> any intact S/G has abnormal radiation, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

	TITLE:	REV: 17
ES-3.2	POST-SGTR COOLDOWN USING BLOWDOWN	PAGE 1 of 13

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RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

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EOP:	TITLE:					REV:	17	
ES-3.2	PC	DST-SGTR	COOLDOWN	USING	BLOWDOWN		·	
						PAGE	2 of	13

- A. PURPOSE This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions rollowing a SGTR. This recovery method depressurizes the ruptured S/G by draining via S/G blowdown.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects the blowdown method.

		REV: 17
ES-3.2 POST-SGTR COOLDOWN	USING BLOWDOWN	
		PAGE 3 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	7
SIEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
	* * * * * * * * * * * *	* * * * * * * *
CAUTIO	<u>N</u>	
IF RCP SEAL COOLING HAD PREVIOUSLY BEEN		
NOT BE STARTED PRIOR TO A STATUS EVALUAT.		CF SHOULD
	* * * * * * * * * * * *	
<u>NOTE</u> : o FOLDOUT page should be open AND	monitored periodically.	
o Adverse CNMT values should be u	sed whenever CNMT pressur	e is
greater than 4 psig or CNMT rad:	iation is greater than 10	+05 R/hr.
* 1 Check RCP Status		
a. Both RCPs – STOPPED	a. Stop all but one RC	P and go to
	Step 2.	U
b. Ensure conditions for starting	b. <u>IF</u> conditions can <u>N</u>	<u>OT</u> be met.
an RCP.	THEN perform the fo	llowing:
o Buz 11A or 11B energized.	1) Verify natural c	irculation
o Refer to ATT-15.0. ATTACHMENT	(Refer to ATT-13 ATTACHMENT NC).	.0,
RCP START.	ATTAORMENT NO).	
	<u>IF</u> natural circu	
	<u>NOT</u> be verified. increase dumping	
	2 Co to Stop 2	
	2) Go to Step 2.	

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 1 continued from previous pag	e)
c. Check RVLIS level (no RCPs) – ≥ 95%	c. <u>IF</u> RVLIS level (no RCPs) less than 95%, <u>THEN</u> perform the following:
	o Increase PRZR level to greater than 65% [82% adverse CNMT].
	o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING.
	o Energize PRZR heaters as necessary to saturate PRZR water.
	<u>IF</u> conditions not met, <u>THEN</u> continue with Step 2. <u>WHEN</u> conditions met, <u>THEN</u> do Step 1d.
d. Start one RCP	d. <u>IF</u> an RCP can <u>NOT</u> be started. <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	<u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam.

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	REV: 17
ES-3.2 POST-SGTR COOLDOWN	PAGE 5 of 1:
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	·
2 Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
3 Check If SI ACCUMs Should Be Isolated:	
a. Check the following:	a. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED
o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	RECOVERY DESIRED. Step 1.
o PRZR level – GREATER THAN 10% [30% adverse CNMT]	
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841, MCC C position 12F MOV-865, MCC D position 12C 	
c. Close SI ACCUM outlet valves	c. Vent any unisolated ACCUMs:
 ACCUM A. MOV-841 ACCUM B. MOV-865 	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A, AOV-834A ACCUM B, AOV-834B
	2) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC.toldetermine contingency actions.
d. Locally reopen breakers for MOV-841 and MOV-865	

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STEP ACTION/EXPECT	TED RESPONSE	[I	RESPONSE NOT OBTAINED]
<u>NOTE</u> : Leakage from ru concentration.	ptured S/G into F	CS will	dilute RCS boron	
4 Verify Adequate Margin	Shutdown			· . . · .
a. Direct RP to sa ruptured S/G fo concentration				
b. Verify boron co GREATER THAN RE FIG-2.0, FIGURE	QUIREMENTS OF	b.	Borate as necessary.	
NOTE: TDAFW pump flow	control AOVs may	drift	open on loss of IA.	
* 5 Monitor Intact S	5/G Level:			
a. Narrow range le THAN 7% [25% ad		a.	Maintain total feed than 200 gpm until r level greater than 7 adverse CNMT] in int	arrow range % [25%
b. Control feed fl narrow range le [25% adverse CN	ve] between 17%	Ъ.	IF narrow range leve intact S/G continues in an uncontrolled m go to ECA-3.1, SGTR REACTOR COOLANT - SU RECOVERY DESIRED, St	s to increase manner, <u>THEN</u> WITH LOSS OF MBCOOLED

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TIRE:

POST-SGTR COOLDOWN USING BLOWDOWN

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minimum RCS pressure necessa to cold shutdown should not 6 Initiate RCS Cooldown To 350°F: a. Establish and maintain coold rate in RCS cold legs - LESS	own
350°F: a. Establish and maintain coold rate in RCS cold legs - LESS	
rate in RCS cold legs - LESS	
THAN 100°F/HR	
b. Dump steam to condenser from intact S/G	b. Manually or locally dump steam from intact S/G using S/G ARV.
	<u>IF</u> no intact S/G available, <u>THEN</u> perform the following:
	o Uge faulted S/G.
	- OR -
	 Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.
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ES-3.2	POST-SG1	R COOLDOWN US	ING BLOWDOW		GE 8 of
STEP	ACTION/EXPECTED RES	PONSE	RESPONSE NOT	OBTAINED	
* * * * '		CAUTION	* * * * * *	* * * * * * *	* * * *
RCS AND	RUPTURED S/G PRESSU	RES MUST BE MAINI	AINED LESS TH	AN 1050 PSIG.	
* * * * *			* * * * * *	* * * * * * *	* * * .*
Char RCS-	rol RCS Pressure ging Flow To Mir To-Secondary Leak	imize age:			
a. Po fi	erform appropriate ac rom table:	ction(s)			
	PRZR LEVEL	RUPTURED S	G NARROW RANG	E LEVEL	
		INCREASING	DECREASING	OFFSCALE HI	GН
	LESS THAN 20% [40% ADVERSE CNMT]	o Increase charging flow	Increase charging flow	o Increase charging f	low
		o Depressurize RCS using Step 7b.		o Maintain R and ruptur S/G pressu	ed
				equal	
	BETWEEN 20% [40% ADVERSE CHMT] AND 50%	Depressurize RCS using Step 7b.	Energize PRZR heaters	Maintain R and ruptur S/G pressu equal	ed
	[40% ADVERSE CHMT]	RCS using Step 7b.	PRZR	Maintain R and ruptur S/G pressu equal Maintain R and ruptur S/G pressu	ed re CS
	[40% ADVERSE CHMT] AND 50% BETWEEN 50% AND 75%	RCS using Step 7b. o Depressurize RCS using	PRZR heaters Energize PRZR	Maintain R and ruptur S/G pressu equal Maintain R and ruptur	ed re CS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
9 Check If RCS Cooldown Should Be Stopped:	
a. RCS cold leg temperatures - LESS THAN 350°F	a. Return to Step 4.
b. Stop RCS cooldown	
c. Maintain RCS cold leg temperature - LESS THAN 350°F	
*10 Monitor Ruptured S/G Narrow Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.
	<u>IF</u> any of the following conditions occurs. <u>THEN</u> stop feed flow to ruptured S/G:
	o Ruptured S/G pressure decreases in an uncontrolled manner.
	- OR -
	o Ruptured S/G pressure increases to 1020 psig.
	OR -
	 Ruptured S/G pressure decreases. to 350 psig psig <u>AND</u> ruptured S/G level greater than 7% [25% adverse CNMT].

EOP: TITLE:	REV: 17
ES-3.2 POST-SGTR COOLDOWN	USING BLOWDOWN PAGE 10 of 13
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: Blowdown from ruptured S/G may be a to less than 400 psig [300 psig adv RCP #1 seal ΔP.	
11 Consult TSC To Determine Appropriate Procedure To Establish Blowdown From Ruptured S/G	<u>IF</u> blowdown can <u>NOT</u> be initiated, <u>THEN</u> go to alternate post-SGTR cooldown procedure, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1, <u>OR</u> ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 1.
*12 Control Charging And Letdown Flow To Maintain PRZR Level:	
a. PRZR level – GREATER THAN 20% [40% adverse CNMT]	a. Increase charging flow as necessary and go to Step 13.
b. PRZR level – LESS THAN 75% [65% adverse CNMT]	b. Decreases charging flow to decrease level and go to Step 14.
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ES-3.2	POST-SGTR COOL	DOWN USING BLOWDOWN PAGE 11 of
- STEP - A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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* * * * *	• • • • • • • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * * *
		NG RCS DEPRESSURIZATION IF RCPS ARE NOT DLY INCREASING PRZR LEVEL.
* * * * *		* * * * * * * * * * * * * * * * * * * *
+12 Dopros	surize RCS To Minimiz	
	-Secondary Leakage:	e
a. Dep spra	ressurize using normal PRZ ay	R a. <u>IF</u> letdown is in service. <u>THEN</u> depressurize using auxiliary spray valve (AOV-296). <u>IF NOT</u> . <u>THEN</u> use one PRZR PORV.
	rgize PRZR heaters as essary	
	ntain RCS pressure at tured S/G pressure	
cor O°F	ntain RCS subcooling based e exit T/Cs - GREATER THAN USING FIG-1.0. FIGURE MIN COOLING	
*14 Monito	or RCP Operation:	
a. RCP	- ANY RUNNING	a. Go to Step 15.
b. Che	ck the following:	b. Stop affected RCP(s).
	RCP #1 seal D/P - GREATER THAN 220 PSID	
۱ ا	Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE R SEAL LEAKOFF	

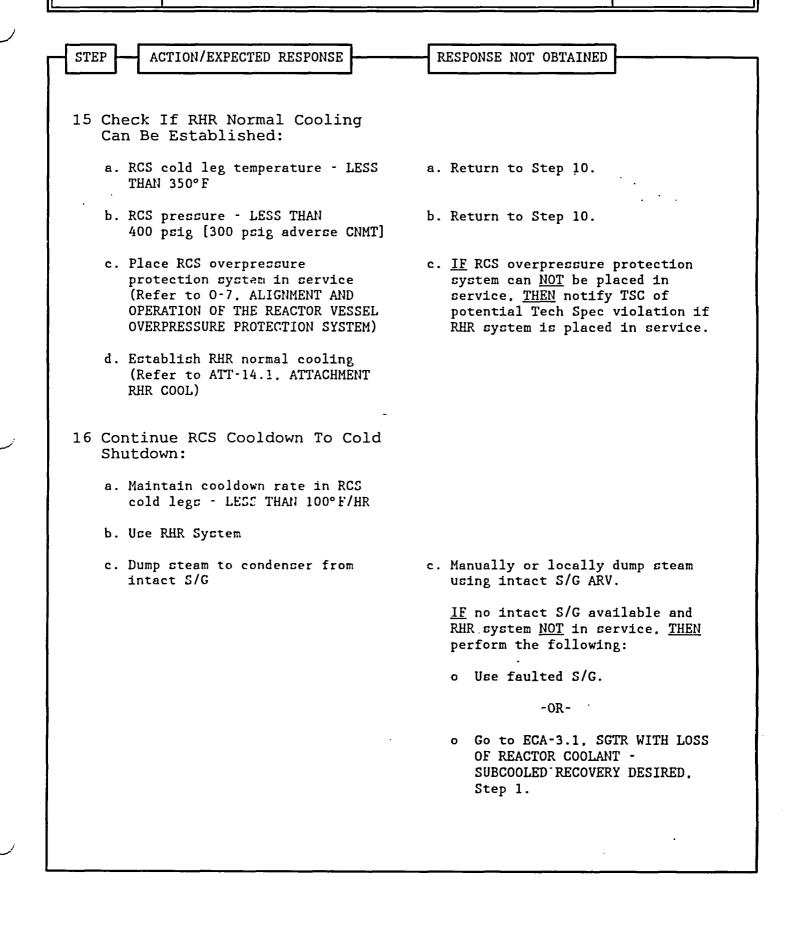
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ES-3.2 POST-SGTR COOLDOWN USING BLOWDOWN	PAGE 13 of 3
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	·]
17 Check Core Exit T/Cs - LESS Return to Step 10. THAN 200°F	
18 Evaluate Long Term Plant Status:	
a. Maintain cold shutdown conditions - (Refer to O-2.2. PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS)	
b. Consult TSC	
- END -	

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ES-3.2 APPENDIX LIST

TITLE

1) RED PATH SUMMARY

TITLE:

- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT RCP START (ATT-15.0)
- 7) ATTACHMENT NC (ATT-13.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) FOLDOUT

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EOP: ES-3.2	TITLE: POST-SGTR COOLDOWN USING BLOWDOWN	REV: 17
E5-3.2	FOST-SGIR COOLDOWN OSING BLOWDOWN	PAGE 1 of 1
	RED PATH SUMMARY	
a. SUBC	CRITICALITY - Nuclear power greater than 5%	
b. CORE	E COOLING - Core exit T/Cs greater than 1200°F -OR-	
	Core exit T/Cs greater than 700°F <u>ANI</u> RVLIS level (no RCPs) less than 52% adverse CNMT]	
c. HEAT	F SINK - Narrow range level in all S/Gs less that [25% adverse CNMT] <u>AND</u> total feedwater : less than 200 gpm	
d. INTE	EGRITY - Cold leg temperatures decrease greater = 100°F in last 60 minutes <u>AND</u> RCS cold lo temperature less than 285°F	
e. CON	TAINMENT - CNMT pressure greater than 60 psig	

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ES-3.2	POST-SGTR COOLDOWN USING BLOWDOWN	
11	· · ·	PAGE 1 of 1

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI_REINITIATION_CRITERIA</u>

Following SI termination, <u>IF</u> either condition listed below occurs, <u>THEN</u> start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

<u>OR</u>

o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN
10% [30% adverse CNMT].

3. <u>SECONDARY INTEGRITY CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. <u>AFW_SUPPLY_SWITCHOVER_CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

5. MULTIPLE S/G_TUBE_RUPTURE_CRITERIA

<u>IF</u> any intact S/G level increases in in an uncontrolled manner O<u>R</u> <u>IF</u> any intact S/G has abnormal radiation, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

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ES-3.3	PC	ST-SGTR	COOLDOWN	USING	STEAM	DUMP			_
							PAGE	1 of	1

GINNA STATION CONTROLLED COPY NUMBER _23_

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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ES-3.3	POST-SGTR COOLDOWN USING STEAM DUMP	REV:	1/
		PAGE	2 of 13

- A. PURPOSE This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a SGTR. This recovery method depressurizes the ruptured S/G by dumping steam.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects steam dump method.
 - b. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, when blowdown is not available and plant staff selects steam dump method.

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
CAUTION	<u>1</u>
o STEAM SHOULD NOT BE RELEASED FROM ANY ITS STEAMLINE.	RUPTURED S/G IF WATER MAY EXIST IN
 AN OFFSITE DOSE EVALUATION SHOULD BE C PROCEDURE. 	COMPLETED PRIOR TO USING THIS
 IF RCP SEAL COOLING HAD PREVIOUSLY BEE NOT BE STARTED PRIOR TO A STATUS EVALU 	
<u>NOTE</u> : o FOLDOUT page should be open AND	monitored periodically.
o Adverse CNMT values should be us	
* 1 Check RCP Status	
a. Both RCPs – STOPPED	a. Stop all but one RCP and go to Step 2.
b. Ensure conditions for starting an RCP.	b. <u>IF</u> conditions can <u>NOT</u> be met. <u>THEN</u> perform the following:
o Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT	 Verify natural circulation (Refer to ATT-13.0. ATTACHMENT NC).
RCP START.	
	<u>IF</u> natural circulation can <u>NOT</u> be verified. <u>THEN</u> increase dumping steam.
	2) Go to Step 2.
	-
This Step continued on the next page.	

P: TITLE: ES-3.3 POST-SGTR COOLDOWN	REV: 17
ES-3.3 POSI-SGIR COOLDOWN	PAGE 4 0:
	·
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 1 continued from previous pag	e)
c. Check RVLIS level (no RCPs) – ≥ 95%	c. <u>IF</u> RVLIS level (no RCPs) less than 95%, <u>THEN</u> perform the following:
	o Increase PRZR level to greater than 65% {82% advers CNMT].
	o Dump steam to establish RCS subcooling based on core exi T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING.
	o Energize PRZR heaters as necessary to saturate PRZR water.
-	<u>IF</u> conditions <u>NOT</u> met. <u>THEN</u> continue with Step 2. <u>WHEN</u> conditions met, <u>THEN</u> do Step 1d
d. Start one RCP	d. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	<u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam.
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POST-SGTR COOLDOWN USING STEAM DUMP

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ſ	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	2 Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
	3 Check If SI ACCUMs Should Be Isolated:	
	a. Check the following:	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED
	o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	RECOVERY DESIRED, Step 1.
	o PRZR level - GREATER THAN 10% [30% adverse CNMT]	
\bigcirc	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
	 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
	c. Close SI ACCUM outlet valves	c. Vent any unisolated ACCUMs:
	ACCUM A. MOV-841ACCUM B. MOV-865	 Open vent valves for unisolated SI ACCUMs.
		 ACCUM A. AOV-834A ACCUM B. AOV-834B
		2) Open HCV-945.
		<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	
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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration. 4 Verify Adequate Shutdown Margin a. Direct RP to sample RCS and ruptured S/G for boron concentration b. Verify boron concentration - concentration b. Verify boron concentration - concentration b. Verify boron concentration - concentration b. Note: TDAFW pump flow control AOVs may drift open on loss of IA.	 DP:	TITLE:			REV: 17
 NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration. Verify Adequate Shutdown Margin a. Direct RP to sample RCS and ruptured S/G for boron concentration b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to EGA-3.1. SGTR WITH LOSS OF REATOR COLANT - SUBCOOLED 	ES-3.3	POST-SGTR COOLDOWN	N USING	G STEAM DUMP	PAGE 6 of 1
 NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration. Verify Adequate Shutdown Margin a. Direct RP to sample RCS and ruptured S/G for boron concentration b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1. SGTR WITH LOSS OF REATOR COLANT - SUBCOOLED 					
 concentration. 4 Verify Adequate Shutdown Margin a. Direct RP to sample RCS and ruptured S/G for boron concentration b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/%. [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF 	STEP -	ACTION/EXPECTED RESPONSE	R	ESPONSE NOT OBTAINED	<u>ا</u>
 Margin a. Direct RP to sample RCS and ruptured S/G for boron concentration b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/%. [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner. THEN go to EGA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED 			CS will	dilute RCS boron	
 ruptured S/G for boron concentration b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0. FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Borate as necessary. b. Borate as necessary. b. Borate as necessary. 					
GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM NOTE: TDAFW pump flow control AOVs may drift open on loss of IA. * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED		ruptured S/G for boron			
 * 5 Monitor Intact S/G Level: a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED 		GREATER THAN REQUIREMENTS OF	b.	Borate as necessary.	
 a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED 	NOTE:	TDAFW pump flow control AOVs may	drift	open on loss of IA.	
 THAN 7% [25% adverse CNMT] than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in intact S/G. b. Control feed flow to maintain narrow range level between 1/% [25% adverse CNMT] and 50% b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner. THEN go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED 	* 5 Mon	itor Intact S/G Level:			
narrow range level between 1/% intact S/G continues to increase [25% adverse CNMT] and 50% in an uncontrolled manner. <u>THEN</u> go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED			a.	than 200 gpm until n level greater than 7	arrow range % [25%
		narrow range level between 1/%	Ъ.	intact S/G continues in an uncontrolled m go to ECA-3.1, SGTR REACTOR COOLANT - SU	to increase manner. <u>THEN</u> WITH LOSS OF BCOOLED
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	ES-3.3	TILE: POST-SGTR COOLDO	OWN USING STEAM DUMP	REV: 17 PAGE 7 of 13			
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•		CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED)			
	mini		ue to depressurize to less tha y for continued RCP operation. e delayed.				
	6 Initiate RCS Cooldown To 350°F:						
	rate	blish and maintain cooldov in RCS cold legs - LESS 100°F/HR	v n				
		steam to condenser from ct S/G	b. Manually or locally from intact S/G usi				
			<u>IF</u> no intact S/G av perform the followi				
			o Use faulted S/G.				
			- OR -				
			o Go to ECA-3.1. S OF REACTOR COOLA SUBCOOLED RECOVE Step 1.	NT -			
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STEP	ACTION/EXPECTED RE	SPONSE	RESPONSE NOT O	BTAINED
* * * *	* * * * * * * * * *	* * * * * * * *	* * * * * * * *	* * * * * * * * *
RCS AN	ID RUPTURED S/G PRESSI	<u>CAUTION</u> IRES MUST BE MAIN	ITAINED LESS THA	N 1050 PSTG
* * * *	* * * * * * * * * * * *	* * * * * * * * *	* * * * * * * * *	* * * * * * * * *
				· .
Cha	ntrol RCS Pressure arging Flow To Mi 5-To-Secondary Lea	nimize		
	Perform appropriate a			
ч.	from table:			
	PRZR	RUPTURED S	G NARROW RANGE	LEVEL
	LEVEL		· · · · · · · · · · · · · · · · · · ·	······································
		INCREASING	DECREASING	OFFSCALE HIGH
	LESS THAN 20% [40% ADVERSE CNMT]	INCREASING o Increase charging flow	Increase	OFFSCALE HIGH o Increase charging flow
	LESS THAN 20%	o Increase	Increase	o Increase
	LESS THAN 20%	o Increase charging flow o Depressurize RCS using	Increase	o Increase charging flow o Maintain RCS and ruptured S/G pressure
	LESS THAN 20% [40% ADVERSE CNMT] BETWEEN 20% [40% ADVERSE CNMT]	 Increase charging flow Depressurize RCS using Step 7b. Depressurize RCS using Step 7b. 	Increase charging flow Energize PRZR	o Increase charging flow o Maintain RCS and ruptured S/G pressure equal Maintain RCS and ruptured S/G pressure
	LESS THAN 20% [40% ADVERSE CNMT] BETWEEN 20% [40% ADVERSE CNMT] AND 50% BETWEEN 50% AND 75%	 Increase charging flow Depressurize RCS using Step 7b. Depressurize RCS using Step 7b. O Depressurize RCS using Step zing 	Increase charging flow Energize PRZR heaters Energize PRZR	 Increase charging flow Maintain RCS and ruptured S/G pressure equal Maintain RCS and ruptured S/G pressure equal Maintain RCS and ruptured S/G pressure

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POST-SGTR COOLDOWN USING STEAM DUMP

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Hy to FI	stablish Required RCS ydrogen Concentration (Refer o S-3.3C, H2 OR O2 REMOVAL ROM PRIMARY SYSTEM BY URPING VCT)	
	heck If RCS Cooldown Should e Stopped:	·
a	. RCS cold leg temperatures – LESS THAN 350°F	a. Return to Step 4.
Ь	. Stop RCS cooldown	
c	. Maintain RCS cold leg temperature - LESS THAN 350°F	
Ra		Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.
	Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	<u>IF</u> any of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G:
		 Ruptured S/G pressure decreases in an uncontrolled manner.
		-OR-
		 Ruptured S/G pressure increases to 1020 psig.
		OR -
• • • •		 Ruptured S/G pressure decreases to 350 psig psig <u>AND</u> ruptured S/G level greater than 7% [25% adverse CNMT].

OP:		REV: 17
ES-3	.3 POST-SGTR COOLDOWN	
		<u> </u>
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * *	CAUTIO)N
יתמוות		_
KUFI	URED S/G PRESSURE MAY DECREASE RAPID	LI WHEN SIEAM IS RELEASED.
* * *		* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> :	Steam release from ruptured S/G mag decreases to less than 400 psig [3] adequate RCP #1 seal ΔP.	
	nitiate Cooldown Of Ruptured /G:	
a	. Verify condenser available:	a. Manually or locally dump steam using ruptured S/G ARV and go to
	o Intact S/G MSIV - OPEN	Step 12.
	o Annunciator G-15, STEAM DUMP _ ARMED - LIT	
Ъ	. Dispatch AO to locally align steam traps associated with the ruptured S/G.	
c	. Dispatch AO to locally open ruptured S/G MSIV bypass valve	
đ	. Dump steam to condenser using steam dump pressure controller	
	ontrol Charging And Letdown low To Maintain FRZR Level:	
F	. PRZR level – GREATER THAN 20% [40% adverse CNMT]	a. Increase charging flow as necessary and go to Step 13.

EOP: ES-3.3 POST-SGTR COOLDOWN U	ISING STEAM DIMP	REV: 17
ES-5.5 POST-SGIR COOLDOWN C		PAGE 11 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED)
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * * *
<u>CAUTION</u>	1	
THE UPPER HEAD REGION MAY VOID DURING RCS RUNNING. THIS WILL RESULT IN A RAPIDLY J		S ARE NOT
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * * *
112 Dermonouries DCC m. Misimiss		
*13 Depressurize RCS To Minimize RCS-To-Secondary Leakage:		
a. Depressurize using normal PRZR spray associated with running RCP	a. <u>IF</u> letdown is in se depressurize using spray valve (AOV-29 <u>THEN</u> use one PRZR P	auxiliary 6). <u>IF NOT</u> ,
b. Energize PRZR heaters as necessary		
c. Maintain RCS pressure at ruptured S/G pressure		
d. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN O°F USING FIG-1.0. FIGURE MIN SUBCOOLING		
*14 Monitor RCP Operation:		
a. RCPs - ANY RUNNING	a. Go to Step 15.	
b. Check the following:	b. Stop affected RCP(s).
o RCP #1 seal D/P - GREATER THAN 220 PSID		
2) Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF		

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	ES-3.3	

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POST-SGTR COOLDOWN USING STEAM DUMP

PAGE 12 of 13

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Check If RHR Normal Cooling Can Be Established	
a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 10.
b. RCS pressure – LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 10.
c. Place RCS overpressure protection system in service (Refer to 0-7. ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service. <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
d. Establish RHR normal cooling (Refer to ATT-14.1. ATTACHMENT RHR COOL)	
16 Continue RCS Cooldown To Cold Shutdown:	
a. Maintain cooldown rate in RCS cold legs - LECS THAN 100°F/HR	
b. Use RHR System	
c. Dump steam to condenser from intact S/G	c. Manually or locally dump steam using intact S/G ARV
	<u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> perform the following:
	o Use faulted S/G.
	-OR-
	o Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.

ES-3.3 POST-SGTR COOLDOWN USING STEAM DUMP PAGE 13 of 1: STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 17 Check Core Exit T/Cs - LESS Return to Step 10. 17 Check Core Exit T/Cs - LESS Return to Step 10. 18 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC -END-				REV: 1	7	
<pre>17 Check Core Exit T/Cs - LESS Return to Step 10. THAN 200°F 18 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC</pre>	E5-3.3		USING SILAM DUMP	PAGE 1	3 of	13
<pre>17 Check Core Exit T/Cs - LESS Return to Step 10. THAN 200°F 18 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC</pre>				_		
THAN 200°F 18 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC	STEP ACT	FION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	<u>}</u>	<u> </u>	
THAN 200°F 18 Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC						
<pre>Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC</pre>	17 Check C THAN 20	ore Exit T/Cs - LESS 0°F	Return to Step 10.			
<pre>Status: a. Maintain cold shutdown conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC</pre>						
conditions (Refer to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC		e Long Term Plant			•	
PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC						
	PLANT	SHUTDOWN FROM HOT SHUTDOWN				
- END -	b. Consu	lt TSC				
			-END-			

EOP: ES-3.3

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PAGE 1 of 1

ES-3.3 APPENDIX LIST

<u>TITLE</u>

TITLE:

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT RCP START (ATT-15.0)
- 7) ATTACHMENT NC (ATT-13.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) FOLDOUT

EOP:		REV: 17
ES-3.3	POST-SGTR COOLDOWN USING STEAM DUMP	PAGE 1 of 1
	RED PATH SUMMARY	
a. SUBC	RITICALITY - Nuclear power greater than 5%	
b. CORE	COOLING - Core exit T/Cs greater than 1200°F -OR-	
	Core exit T/Cs greater than 700°F <u>ANI</u> RVLIS level (no RCPs) less than 52% adverse CNMT]	
c. HEAT	SINK - Narrow range level in all S/Gs less than [25% adverse CNMT] <u>AND</u> total feedwater f less than 200 gpm	
d. INTE	GRITY - Cold leg temperatures decrease greater t 100°F in last 60 minutes <u>AND</u> RCS cold le temperature less than 285°F	

e. CONTAINMENT - CNMT pressure greater than 60 psig

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EOP:

PAGE 1 of 1

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. <u>SI_REINITIATION_CRITERIA</u>

Following SI termination, <u>IF</u> either condition listed below occurs, <u>THEN</u> start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

 RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

<u>OR</u>

- o PRZR level CHARGING CAN NOT CONTROL LEVEL GREATER THAN
 10% [30' adverse CNMT].
- 3. <u>SECONDARY INTEGRITY CRITERIA</u>

<u>IF</u> any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized <u>AND</u> has not been isolated, <u>THEN</u> go to E-2, FAULTED S/G ISOLATION, Step 1, <u>UNLESS</u> faulted S/G needed for RCS cooldown.

4. <u>AFW SUPPLY SWITCHOVER CRITERION</u>

<u>IF</u> CST level decreases to less than 5 feet, <u>THEN</u> switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

5. MULTIPLE S/G TUBE RUPTURE CRITERIA

<u>IF</u> any intact S/G level increases in in an uncontrolled manner <u>OR IF</u> any intact S/G has abnormal radiation, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

EOP:		REV: 21
FR-C.1	RESPONSE TO INADEQUATE CORE COOLING	PAGE 1 of 18

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

<u>11 - 17 - 2004</u> EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

FR-C.1	TIRE:				REV:	21
		RESPONSE	то	INADEQUATE	E CORE COOLING	PAGE

- A. PURPOSE This procedure provides actions to restore core cooling.
- B. ENTRY CONDITIONS/SYMPTOMS

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- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.2, CORE COOLING Critical Safety Function Status Tree, on a RED condition.

EOP:	TITLE:		REV: 21
FR-C.1	RESPONSE TO INADE	QUATE CORE COOLING	PAGE 3 of 1
		<u></u>	
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	ED
g	dverse CNMT values should be reater than 4 psig or CNMT r foldout Page should be open a	adiation is greater than 1	10 ⁺⁰⁵ R/hr.
	r RWST Level - GREATER		•
* 1 Monito THAN 2			-
		a. Ensure SI system a cold leg recircula Steps 1 through 13 TRANSFER TO COLD I RECIRCULATION.	ation using 3 of ES-1.3.
		b. <u>WHEN</u> the SI system for sump recircula to Step 4.	
	SI Pump Suction d to RWST:		
	fy SI pump suction valves RWST - OPEN	a. Ensure at least or suction valve from	
	DV-825A DV-825B	MOV-825AMOV-825B	·
		·	

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	FR-C.1 RESPONSE TO INADEQU	REV: 21
		PAGE 4 of 18
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1	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTIO	<u>DN</u>
	RHR PUMPS SHOULD NOT BE RUN LONGER THAN EXCHANGERS.	1 HOUR WITHOUT CCW TO THE RHR HEAT
	* * * * * * * * * * * * * * * * * * *	• • • • • • • • • • • • • • • • • • • •
	3 Verify SI Pump And RHR Pump Emergency Alignment:	
	a. RHR pump discharge to Rx vessel deluge – OPEN	a. Ensure at least one valve open.
	 MOV-852A MOV-852B 	·
	b. Verify both RHR pumps – RUNNING	b. Manually start pumps
	c. Verify SI pump C – RUNNING	c. Manually start pump on available bus.
	d. Verify SI pump A - RUNNING	d. Perform the following:
		 Ensure SI pumps B and C running.
		2) Ensure SI pump C aligned to discharge line A:
		o MOV-871B closed
		o MOV-871A open
		3) Go to Step 4.
	e. Verify Sl pump B - RUNNING	e. Perform the following:
		 Ensure SI pumps A and C running.
		 Ensure SI pump C aligned to discharge line B:
		o MOV-871B open
		o MOV-871A closed
		3) Go to Step 4.
	f. Verify both SI pump C discharge valves - OPEN	f. Manually open valves as necessary.
	• MOV-8/1A • MOV-8/1B	·

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P:	TITLE:	REV: 21
FR-C.1	RESPONSE TO INADEQUA	ATE CORE COOLING PAGE 5 of
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Verify	SI Flow In Both Trains:	Perform the following:
	line loop A and B flow icators - CHECK FOR FLOW	a. Manually start pumps and align valves as necessary.
	loop flow indicator – CHECK FLOW	 b. Establish maximum charging flow. c. Continue efforts to establish SI or RHR flow.
5 Check	RCP Support Conditions:	
a. Veri	Lfy Bus 11A or 11B - ENERGIZED	a. Restore power to Bus 11A or 11B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
cond	ck other RCP support litions (Refer to ATT-15.0. ACHMENT RCP START)	b. Continue attempts to establish RCP support conditions.
		 <u>IF</u> SI ACCUM discharge valves closed after ACCUM discharge. <u>THEN</u> go to Step 7. <u>IF NOT</u>. <u>THEN</u> perform the following: a. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves.
		 MOV-841. MCC C position 12F MOV-865. MCC D position 12C
		 b. Open SI ACCUM discharge valves. ACCUM A. MOV-841 ACCUM B. MOV-865

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EOP: TITLE:		REV: 21
FR-C.1 RESPONSE TO INADEQUA	ATE CORE COOLING	PAGE 6 of 18
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
7 Check Core Exit T/Cs - LESS THAN 1200°F	Go to Step 10.	
8 Check RVLIS Indication:		
a. RCPs - BOTH SECURED	a. Return to procedure effect	e and step in
b. RVLIS level – GREATER THAN 52% [55% adverse CNMT]	b. <u>IF</u> RVLIS increasing to Step 1. <u>IF NOT</u> , Step 9.	
c. Return to procedure and step in effect		
9 Check Core Exit T/Cs:		
a. Temperature - LESS THAN 700°F	a. <u>IF</u> decreasing, <u>THEN</u> Step 1. <u>IF NOT, TH</u> Step 10.	
b. Return to procedure and step in effect		
<u>CAUTIO</u>	• • • • • • • • • • • • • • • • • • •	* * * * * * * *
IF OFFSITE POWER IS LOST AFTER SI RESET. TO RESTART SAFEGUARDS EQUIPMENT. (REFER OFFSITE POWER)		
	• • • • • • • • • • • • • • • • •	* * * * * * * *
10 Reset SI		
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FR-C.1 RESPONSE TO INADEQU		REV: 21
		PAGE 7 of 1
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	ED
11 Reset CI:		
a. Depress CI reset pushbutton		
b. Verify annunciator A-26. CNMT ISOLATION - EXTINGUISHED	b. Perform the follow	ing:
. ISOLATION - EXTINGUISHED	1) Reset SI.	
	2) Depress CI rese	t pushbutton.
<u>NOTE</u> : This procedure should be continued sample in Step 12.	while obtaining CNMT hy	drogen
12 Check CNMT Hydrogen Concentration:		
a. Direct RP to start CNMT hydrogen monitors as necessary		
b. Hydrogen concentration - LESS THAN 0.5%	b. Consult TSC to det hydrogen recombine placed in service.	rs should be

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FR-C.1 RESPONSE TO INADEQUATE CORE COOLING	REV: 21
	PAGE 8 of 18
	-
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	
	* * * * * * *
 IF CST LEVEL DECREASES TO LESS THAN 5 FEET. THEN ALTERNATE WATH FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1. ALTERNATE W TO AFW PUMPS). 	
 A FAULTED OR RUPTURED S/G SHOULD NOT BE USED IN SUBSEQUENT STEP INTACT S/G IS AVAILABLE. 	PS UNLESS NO
	* * * * * * *
<u>NOTE</u> : TDAFW pump flow control AOVs may drift open on loss of IA.	
*13 Monitor Intact S/G Levels:	
a. Narrow range level - GREATER THAN 7% [25% adverse CNMT] level greater than 7 adverse CNMT] in at S/G.	narrow range 7% [25%
<u>IF</u> total feed flow g 200 gpm can <u>NOT</u> be e <u>THEN</u> perform the fol	established,
1) Continue attempts establish a heat least one S/G (Re ER-AFW.1, ALTERNA SUPPLY TO AFW PUN	sink in at efer to ATE WATER
. 2) Go to Step 23.	
b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	
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FR-C.1	TIRE: RESPONSE TO INADEQU	ATE CORE COOLING REV: 21
	<u> </u>	PAGE 9 of 1
- STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
		· · · · · · · · · · · · · · · · · · ·
	CAUTIO	<u>N</u>
	R PORV OPENS BECAUSE OF HIGH P SURE DECREASES TO LESS THAN 23	RZR PRESSURE, IT SHOULD BE CLOSED 35 PSIG (REFER TO STEP 14B).
* * * * * *		* * * * * * * * * * * * * * * * * * *
14 Check	RCS Vent Paths:	
	er to PRZR PORV block valves VAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV:
		 MOV-515. MCC D position 6C MOV-516. MCC C position 6C
b. PORV	s - CLOSED	b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.
		<u>IF</u> any PORV can <u>NOT</u> be closed. <u>THEN</u> manually close its block valve.
c. Bloc	k valves – AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.
d. Rx v CLOS	essel head vent valves – SED	d. Manually close valves.
• SC • SC	0V-590 0V-591 0V-592 0V-593	

FR-C.1 RESPONSE TO INADEQUA	
	PAGE 10 of 1
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Establish Condenser Steam Dump Manual Control	
a. Verify condenser available:	a. Place intact S/G ARV controller
o Intact S/G MSIV - OPEN	in MANUAL and go to Step 16.
o Annunciator G-15, STEAM DUMP ARMED - LIT	
b. Place steam dump mode selector switch in MANUAL	
c. Place steam dump controller in MANUAL	· · · · · · · · · · · · · · · · · · ·
<u>NOTE</u> : Partial uncovering of S/G tubes is	acceptable in the following steps.
16 Depressurize All Intact S/Gs To 200 PSIG:	
a. Dump steam to condenser at maximum rate	a. Manually or locally dump steam at maximum rate using S/G ARVs.
b. Check S/G pressure – LESS THAN 200 PSIG	b. <u>IF</u> S/G pressure decreasing, <u>THEN</u> return to Step 13.
	<u>IF NOT, THEN</u> go to Step 23.
c. Check RCS hot leg temperatures - BOTH LESS THAN 400°F	c. <u>IF</u> RCS hot leg temperatures decreasing, <u>THEN</u> return to Step 13.
	<u>IF NOT. THEN</u> go to Step 23.
d. Stop S/G depressurization	

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RESPONSE TO INADEQUATE CORE COOLING

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17 Check If SI ACCUMs Should Be Isolated:	
a. RCS hot leg temperatures - BOTH LESS THAN 400°F	a. Go to Step 23.
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary	
 MOV-841 MCC C position 12F MOV-865 MCC D position 12C 	
c. Verify SI reset	c. Manually reset SI.
 d. Close SI ACCUM discharge valves ACCUM A. MOV-841 ACCUM B. MOV-865 	 d. Perform the following to vent an unisolated accumulator: Reset CI. Ensure adequate air compressor(s) running. Establish IA to CNMT. 3) Establish IA to CNMT. 4) Open vent valves for unisolated SI ACCUMs. ACCUM A. AOV-834A ACCUM B. AOV-834B 5) Open HCV-945. IF an accumulator can NOT be isolated or vented. THEN consult TSC to determine contingency actions.

OP: TITLE:	REV: 21
FR-C.1 RESPONSE TO INADEQUA	TE CORE COOLING PAGE 12 of
	······································
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
· ·	
18 Stop Both RCPs	
19 Dump Steam to Condenser At Maximum Rate To Depressurize All Intact S/Gs To Atmospheric Pressure	Manually or locally dump steam at maximum rate using S/G ARVs.
	·
20 Verify SI Flow:	Perform the following:
o SI line loop A and B flow indicators – CHECK FOR FLOW	a. Continue efforts to establish SI or RHR flow.
-OR-	b. Try to establish charging flow.
o RHR loop flow indicator - CHECK FOR FLOW	c. <u>IF</u> core exit T/Cs less than 1200°F, <u>THEN</u> return to Step 19.
	<u>IF_NOT, THEN</u> go to Step 23.
21 Check Core Cooling:	
a. Core exit T/Cs - LESS THAN 1200°F	a. Go to Step 23.
b. RCS hot leg temperatures - BOTH LESS THAN 320°F	b. Return to Step 19.
c. RVLIS level (no RCPs) – GREATER THAN 77% [82% adverse CNMT]	c. Return to Step 19.

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EOP:	TITLE:		REV: 21
FR-C.1	RESPONSE TO INADEQU	JATE CORE COOLING	PAGE 13 of 18
	······································		
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAIN	ED
22 Go to Proced	Appropriate Plant ure		
	k RWST level - GREATER THAN		
		LEG RECIRCULATION	, Step 1.
	:o E-1, LOSS OF REACTOR OR DNDARY COOLANT, Step 17		
	-		
		•	

FR-C.1 RESPONSE TO INADEQU	DATE CORE COOLING PAGE 14 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23 Check If RCPs Should Be Started:	
a. Core Exit T/Cs - GREATER THAN 1200°F	a. Go to Step 24.
b. Check if an idle RCS cooling loop is available	b. Perform the following:1) Porct SI
o Narrow range S/G level - GREATER THAN 7% [25% adverse CNMT]	1) Reset SI. 2) Reset CI.
o RCP in associated loop - AVAILABLE AND NOT OPERATING	 Ensure adequate air compressor(s) running.
	4) Establish IA to CNMT.
•	5) Open all PRZR PORVs and block valves
	a) <u>IF</u> any block valve can <u>NOT</u> be opened, <u>THEN</u> ensure power supplied to block valve.
	b) <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
	6) <u>IF</u> core exit T/Cs remain greater than 1200°F, <u>THEN</u> open Rx vessel head vent valves.
	 SOV-590 SOV-591 SOV-592 SOV-593
	7) Go to Step 24.
c. Start RCP in one idle RCS cooling loop	
d. Return to Step 23a	

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FR-C.1 RESPONSE TO IN	VADEQUATE CORE COOLING REV: 21
	PAGE 15 of 18
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24 Dump Steam To Condenser At Maximum Rate To Depressur All Intact S/Gs To	
Atmospheric Pressure:	<u>IF</u> ARVs not available on intact S/Gs. <u>THEN</u> :
	 Open TDAFW pump steam supply valve from intact S/G(s)
	 S/G A. MOV-3505A S/G B. MOV-3504A
	- OR -
	o Perform the following:
	a. Open intact S/G MISV bypass valves
	b. Open both priming air ejector steam inlet valves
	 V-3580 V-3581
	<u>IF</u> no intact S/G available, <u>THEN</u> use faulted or ruptured S/G.
25 Check Core Exit T/Cs - LES THAN 1200°F	SS <u>IF</u> core exit temperatures decreasing, <u>THEN</u> return to step 23.
	<u>IF</u> core exit temperatures increasing, <u>THEN</u> go to SACRG-1. SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.

ļ	EOP:	
	FR-C.1	

TITLE:

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RESPONSE TO INADEQUATE CORE COOLING

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26 Check If SI ACCUMs Should Be Isolated:	
a. RHR loop flow indicator - AT LEAST INTERMITTENT FLOW	a. Go to Step 28.
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary	
 MOV-841 MCC C position 12F MOV-865 MCC D position 12C 	
c. Reset SI.	
d. Close SI ACCUM discharge valves	d. Perform the following to vent an unisolated accumulator:
 ACCUM A. MOV-841 ACCUM B. MOV-865 	1) Reset CI.
	 Ensure adequate air compressor(s) running.
	3) Establish IA to CNMT.
	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	5) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented. <u>THEN</u> consult TSC to determine contingency actions.
e. Locally reopen breakers for MOV-841 and MOV-865	

EOP:	TITLE:	·····	-
FR-C.		ATE CORE COOLING	
		PAGE 17 of 1	3
<u>,</u>			
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	-
	eck If RCPs Should Be opped:		
а.	Both RCS hot leg temperatures - LESS THAN 320°F	a. Go to Step 28.	
b.	Stop all RCPs	·	
28 Ve:	rify SI Flow:	Perform the following:	
o	SI line loop A and B flow indicators - CHECK FOR FLOW	a. Continue efforts to establish SI or RHR flow.	
	- OR -	b. Try to establish charging flow.	
o	RHR loop flow indicator - CHECK FOR FLOW	c. Return to Step 23.	
29 Ch	eck Core Cooling:		
а.	RCS hot leg temperatures - LESS THAN 320°F	a. Return to Step 23.	
ь.	RCPs - BOTH SECURED	b. Stop all RCPs.	

c. RVLIS level - GREATER THAN 77% c. Return to Step 23. [82% adverse CNMT]

EOP: TITLE:		REV: 21
FR-C.1 RESPONSE TO INAD	EQUATE CORE COOLING	PAGE 18 of 1
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	<u> </u>
30 Go to Appropriate Plant Procedure		
a. <u>IF</u> PRZR PORVs and head vents were opened in Step 23, <u>THEN</u> consult TSC to evaluate long		
term status <u>AND</u> continue with transitions.	·	
b. Check RWST level - GREATER THAM 28%	N b. Go to ES-1.3. TRANSFER LEG RECIRCULATION, Ste	
c. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17.		
	-END-	

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TITLE:

PAGE 1 of 1

FR-C.1 APPENDIX LIST

TITLE

- 1) ATTACHMENT RCP START (ATT-15.0)
- 2) ATTACHMENT N2 PORVS (ATT-12.0)
- 3) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 4) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 5) FOLDOUT PAGE

EOP:	TITLE:		_				 REV:	21
FR-C.1		RESPONSE	то	INADEQUATE	CORE	COOLING		21
							PAGE	1 of

1

FOLDOUT_PAGE

NOTE: This Foldout Page applies to all FR-C series procedures.

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

	EOP:	TINE:	REV: 19
•	FR-C.2	RESPONSE TO DEGRADED CORE COOLING	
:			PAGE 1 of 14

GINNA STATION

23 CONTROLLED COPY NUMBER _

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

EOP:	TIRE:						REV:	19	
FR-C.2		RESPONSE	TO D	EGRADED (CORE	COOLING	PAGE	2 of	14

- A. PURPOSE This procedure provides actions to restore adequate core cooling.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.2, CORE COOLING Critical Safety Function Status Tree, on any ORANGE condition.

EOP:
FR-C.2

TITLE:

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : o Adverse CNMT values should be u greater than 4 psig or CNMT rad o Normal conditions for running F NOT be tripped if normal condit maintained.	diation is greater than 10 ⁺⁰⁵ R/hr. RCPs are desired, but RCPs should
o Foldout Page should be open and	l monitored periodically.
* 1 Monitor RWST Level - GREATER THAN 28%	Perform the following: a. Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3. TRANSFER TO COLD LEG RECIRCULATION.
	b. Go to Step 4.
<pre>2 Verify SI Pump Suction Aligned To RWST: a. SI pump suction valves from RWST - OPEN</pre>	a. Ensure at least one SI pump suction valve from RWST open
• MOV-825A • MOV-825B	• MOV-825A • MOV-825B

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	FR-C.2

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RESPONSE TO DEGRADED CORE COOLING

PAGE 4 of 14

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3 Verify SI Pump And RHR Pump Emergency Alignment:	
a. RHR pump discharge to Rx vessel deluge - OPEN	a. Ensure at least one valve open.
• MOV-852A • MOV-852B	
b. Verify SI pump C – RUNNING	b. Manually start pump on available bus.
c. Verify SI pump A – RUNNING	c. Perform the following:
	 Ensure SI pumps B and C running.
_	2) Ensure SI pump C aligned to discharge line A:
	o MOV-871B closed
	o MOV-871A open
	3) Go to Step 4.
d. Verify SI pump B - RUNNING	d. Perform the following:
	 Ensure SI pumps A and C running.
	2) Ensure SI pump C aligned to discharge line B:
	o MOV-871B open
	o MOV-871A closed
	3) Go to Step 4.
e. Verify both SI pump C discharge valves - OPEN	e. Manually open valves as necessary.
MOV-871AMOV-871B	
• 100-0716	

FR-C.2 RESPONSE TO DEGRADE	
	PAGE 5 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Verify SI Flow In Both Trains:	
a. SI line loop A and B flow indicators - CHECK FOR FLOW	a. Perform the following:
	 Manually start SI pumps and align valves as necessary.
	2) Establish maximum charging flow.
b. RCS pressure – LESS THAN 250 psig [465 psig adverse CNMT]	b. Go to Step 5.
c. RHR loop flow indicator - CHECK FOR FLOW	c. Manually start RHR pumps and align valves.

FR-C.2 RESPONSE		CORE COOLING	REV: 19
FR-C.2 RESPONSE	TO DEGRADED	CORE COOLING	PAGE 6 of
STEP ACTION/EXPECTED RESPO	DNSE	RESPONSE NOT OBTAINED]
* * * * * * * * * * * * * * * *	* * * * * * *	* * * * * * * * * * * *	* * * * * *
	CAUTION		
IF ANY PRZR PORV OPENS BECAUSH AFTER PRESSURE DECREASES TO LH			
* * * * * * * * * * * * * * * *	* * * * * * *	* * * * * * * * * * * *	*****
5 Check RCS Vent Paths:			
a. Power to PRZR PORV block - AVAILABLE	k valves .	a. Restore power to blo unless block valve w isolate an open PORV	as closed to
		 MOV-515. MCC D pos MOV-516. MCC C pos 	
b. PORVs - CLOSED		b. <u>IF</u> PRZR pressure les 2335 psig, <u>THEN</u> manu PORVs.	
		<u>IF</u> any PORV can <u>NOT</u> <u>THEN</u> manually close valve.	
c. Block valves AT LEAST	one open	c. Open one block valve was closed to isolat PORV.	
d. Rx vessel head vent valv CLOSED	ves -	d. Manually close valve	25.
 SOV-590 SOV-591 SOV-592 SOV-593 			
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EOP	: FR-C.2	TINE: RES	PONSE '	TO D	EGRADED	CORE	COOLING	G
	STEP A	CTION/EXPECT	ED RESPO	ONSE		RESPO	NSE NOT	OBTAINED

6 Check RCP Status:

- a. At least one RCP RUNNING
- b. Support conditions for the operating RCP(s) available (Refer to ATT-15.0, ATTACHMENT RCP START)
- 7 Check RVLIS Fluid Fraction
 - a. Fluid fraction (any RCP on) -GREATER THAN 66%
 - b. Return to procedure and step in effect.
- 8 Check If One RCP Should Be Stopped:
 - a. Both RCPs RUNNING
 - b. Stop one RCP
 - c. Go to Step 10

9 Check Core Cooling:

- a. RVLIS level (no RCPs) GREATER THAN 52% [55% adverse CNMT]
- b. Core exit T/Cc LESS THAN /00°F
- c. Return to procedure and step in effect

- a. Go to Step 9.
- b. Try to establish support conditions for the operating RCP.
- a. IF increasing, THEN return to Step 1.
 - IF NOT, then go to Step 8.

a. Go to Step 10.

- a. IF increasing, THEN return to Step 1. <u>IF NOT</u>, <u>THEN</u> go to Step 10.
- b. IF decreasing, THEN return to Step 1. IF NOT, THEN go to Step 10.

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FR-C.2 RESP	ONSE TO DEGRA	DED CORE COOLING	REV: 19 PAGE 8 of 14
			۱
STEP ACTION/EXPECTED	D RESPONSE	RESPONSE NOT OBTAINED	
10 Check SI ACCUM Di Valves - OPEN • MOV-841 • MOV-865	scharge	<u>IF</u> SI ACCUM discharge v after ACCUM discharge, Step 11. <u>IF NOT, THEN</u> following:	THEN go to
• MOV-865		a. Dispatch AO with loc key to locally close for SI ACCUM dischar	e breakers
		 MOV-841, MCC C pos MOV-865, MCC D pos 	
		b. Open SI ACCUM discha	arge valves.
		 ACCUM A. MOV-841 ACCUM B. MOV-865 	
* * * * * * * * * * * *	CAUT	••••••••••••••••••••••••••••••••••••••	* * * * * * *
		5 FEET, THEN ALTERNATE WATE FER TO ER-AFW.1, ALTERNATE W	
 A FAULTED OR RUPTURE INTACT S/G IS AVAILA 		F BE USED IN SUBSEQUENT STEP	PS UNLESS NO
	* * * * * * * *		* * * * * * *
<u>NOTE</u> : TDAFW pump flow c	ontrol AOVs may	drift open on loss of IA.	
*11 Monitor Intact S/	G Levels:		
a. Narrow range leve THAN 7% [25% adve		a. Increase total feed restore narrow range greater than 7% [25% CNMT] in at least or	e level 4 adverse
b. Control feed flow narrow range leve [25% adverse CNMT	1 between 17%		

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RESPONSE TO DEGRADED CORE COOLING

PAGE 9 of 14

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10 5	stablish Cardenson Char	
	stablish Condenser Steam ump Manual Control	
A	Verify condenser available:	a. Place intact S/G ARV controller
4		in MANUAL and go to Step 13.
	o Intact S/G MSIV - OPEN	
	o Annunciator G-15, STEAM DUMP ARMED - LIT	
Ъ	. Place steam dump mode selector switch in MANUAL	
c	. Place steam dump controller in MANUAL	

FR-C.2 RE	SPONSE TO DEGRAI	REV: 19
	SPONSE IO DEGRAL	PAGE 10 of
STEP ACTION/EXPEC	TED RESPONSE	RESPONSE NOT OBTAINED
* * * * * * * * * * *	* * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
RED PATH CONDITION IN	F-0.4. INTEGRITY S	ATOR INJECTION WHICH MAY RESULT IN A STATUS TREE. THIS PROCEDURE SHOULD BE RESPONSE TO IMMINENT PRESSURIZED
*******	* * * * * * * * * *	
13 Depressurize Al To 200 PSIG:	l Intact S/Gs	
a. Maintain cooldo cold legs - LES	own: rate in RCS S THAN 100°F/HR	
b. Dump steam to c	condenser	b. Manually or locally dump steam from intact S/Gs:
		o Use S/G ARVs.
		- OR -
	-	o Open TDAFW pump steam supply valve(s) for affected S/G(s):
		• S/G A. MOV-3505A • S/G B. MOV-3504A
		- OR -
		o Locally perform the following:
		o Open intact S/G MSIV bypass valve.
		o Open priming air ejector steam isolation valves.
		• V-3580 • V-3581
c. Check S/G press 200 PSIG	urec - LESS THAN	c. Return to Step 11.
d. Check RCS hot l BOTH LESS THAN	eg temperatures – 400°F	d. Return to Step 11.

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	EOP: FR-C.2	RESPONSE TO DEGRADE	D CORE COOLING	REV: 19
:	IN 0.2			PAGE 11 of 14
<u> </u>				
\smile	STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	J
			L	
	* * * * * *	CAUTION	* * * * * * * * * * * * *	
	RHR PUMPS EXCHANGERS	SHOULD NOT BE RUN LONGER THAN 1	HOUR WITHOUT CCW TO THE	RHR HEAT
	* * * * * *	* * * * * * * * * * * * * * *	* * * * * * * * * * * * *	
	14 Check	RHR Pumps - RUNNING	Manually start pumps as	necessary.
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IP: TITLE:	REV: 19
FR-C.2 RESPONSE TO DEGRADE	ED CORE COOLING PAGE 12 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Isolate Both SI ACCUMs	
a. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary	
 MOV-841. MCC C position 12F MOV-865, MCC D position 12C 	
b. Reset SI	
c. Close SI ACCUM discharge valves	c. Perform the following to vent an unisolated accumulator:
MOV-841MOV-865	1) Reset CI
	 Ensure adequate air compressor(s) running
	3) Establish IA to CNMT
	4) Open vent valves for unisolated SI ACCUMs.
	 ACCUM A, AOV-834A ACCUM B, AOV-834B
	5) Open HCV-945.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.
d. Locally reopen breakers for MOV-841 and MOV-865	·

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	FR-C.2	TILE: RESPONSE TO DEG	RADED CORE COOLING	REV: 19
•				PAGE 13 of 14
\smile		<u> </u>	r	7
	STEP AC	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	J
	* * * * * *	• • • • • • • • • • • • • • • • • • •	<u>UTION</u>	******
		OR FR-C.1. RESPONSE TO INA DURING SUBSEQUENT STEPS.	DEQUATE CORE COOLING, SHOULD E	E CLOSELY
	* * * * * *	* * * * * * * * * * * * *	* * * * * * * * * * * * * * *	* * * * * * *
	16 Stop A	ll RCPs		
		surize All Intact S/Gs ospheric Pressure:	5	
		tain cooldown rate in RCS legs - LESS THAN 100°F/HR		
	b. Dump	steam to condenser	b. Manually or locally from intact S/Gs:	dump steam
\bigcirc			1) Use S/G ARVs.	
			2) Open TDAFW pump s valve(s) for affe	
			 S/G A. MOV-3505 S/G B. MOV-3504 	
			3) Locally perform t	he following:
			o Open intact S/ bypass valve.	G MSIV
			o Open priming a steam isolatio	
			• V-3580 • V-3581	
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EOP:	TITLE:
FR-C.2	

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RESPONSE TO DEGRADED CORE COOLING

PAGE 14 of 14

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Verify SI Flow:	Perform the following:
o SI line loop A and B flow indicators - CHECK FOR FLOW	a. Continue efforts to establish SI or RHR flow.
- OR -	b. Try to establish maximum charging flow.
o RHR loop flow indicator – CHECK FOR FLOW	c. Return to Step 17.
19 Check Core Cooling:	Return to Step 17.
o RVLIS level (no RCPs) – GREATER THAN 77% [82% adverse CNMT]	
o Both RCS hot leg temperatures - LESS THAN 320°F	
20 Go to Appropriate Plant Procedure	
a. Check RWST level – GREATER THAN 28%	a. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
b. Go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	
- F	END -
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FR-C.2 APPENDIX LIST

TITLE

- 1) ATTACHMENT RCP START (ATT-15.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 3) FOLDOUT

TITLE:

EOP:	
FR-C.2	

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PAGE 1 of 1

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-C series procedures.

1. LOSS OF SW CRITERIA

TITLE:

- IF no SW pumps are available, THEN perform the following:
 - a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 31
FR-H.1		PAGE 1 of 31

GINNA STATION CONTROLLED COPY NUMBER <u>23</u>

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	TITLE:	REV: 31
FR-H.1	RESPONSE TO LOSS OF SECONDARY HEAT SINK	
		PAGE 2 of 31

- A. PURPOSE This procedure provides actions for responding to a loss of secondary heat sink in both 5/Gs.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, when minimum AFW flow is not verified <u>AND</u> narrow range level in both S/Gs is less than 7% [25% adverse CNMT] |
 - b. F-0.3, HEAT SINK Critical Safety Function Status Tree on a RED condition.

OP: TITLE: FR-H.1 RESPONSE TO LOSS OF SE	CONDARY HEAT SINK	
	PAGE 3 of	: :
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
• • • • • • • • • • • • • • • • • • •	<u>) * * * * * * * * * * * * * * * * * * *</u>	r 🕶
 IF TOTAL FEED FLOW IS LESS THAN 200 (PROCEDURE SHOULD NOT BE PERFORMED. 	GPM DUE TO OPERATOR ACTION, THIS	
 FEED FLOW SHOULD NOT BE REESTABLISHED S/G IS AVAILABLE.) TO A FAULTED S/G IF A NON-FAULTED	
		• *
 o Foldout Page should be open and 1 Check If Secondary Heat Sink Is Required: 	liation is greater than 10 ⁺⁰⁵ R/hr. I monitored periodically.	
a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. <u>IF</u> RWST level greater than 28%, <u>THEN</u> return to procedure and step in effect.	
	<u>IF</u> RWST level less than 28%. <u>THEN</u> go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION. Step 1.	
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This Step continued on the next page.

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EOP:	TITLE:		REV: 31
FR-H.1	RESPONSE TO LOSS OF SEC	CONDARY HEAT SINK	PAGE 4 of 3
- STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	<u></u>
(Step	1 continued from previous page?)	
	ek RCS cold leg temperature - ATER THAN 350°F	 b. <u>IF</u> RCS pressure less 400 psig [300 psig a CNMT]. <u>THEN</u> try to p System in service will continuing with this 1) Reset SI. 2) Place letdown procontroller in MAM 3) Open the following (reset xy relays) AOV-371, letdown valve AOV-427, loop I REGEN Hx At least one loo orifice valve AOV-200B, or AO 4) <u>IF</u> pressure on PS than 400 psig. <u>THE</u> RHR normal cooling ATT-14.1, ATTACHN COOL). 5) <u>IF</u> adequate cool: system established return to proceed in effect. 	adverse place RHR mile s procedure: WAL CLOSED. My valves): wn isolation 3 cold leg to etdown (AOV-200A. DV-202) I-135 less <u>HEN</u> establish mg (Refer to MENT RHR ing with RHR ed, <u>THEN</u>

OP: FR-H.1	TITLE: RESPONSE TO LOSS OF SEC	CONDARY HEAT SINK	REV: 31
			PAGE 5 of
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	D
* 2 Mor	nitor Secondary Heat Sink:	<u>IF</u> a loss of heat sin indicated, <u>THEN</u> perfo	
· O	Verify either S/G level – WIDE RANGE GREATER THAN 50 inches	following:	
	[100 inches adverse CNMT]	a. Trip both RCPs.	
o	Verify PRZR pressure – LESS THAN 2335 PSIG	b. Go to Step 13 to 1 and feed cooling.	nitiate bleed

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		<u> </u>
FR-H.1 RESPONSE TO LOSS OF SE		_
	PAGE 6 of	3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
<u>CAUTIO</u>	<u>N</u>	*
IF CST LEVEL DECREASES TO LESS THAN 5 FE AFW PUMPS WILL BE NECESSARY (REFER TO ER PUMPS).		
		*
3 Try to Establish AFW Flow To At Least One S/G:		
a. Check S/G blowdown and samples valves ~ CLOSED	a. Place S/G blowdown and sample valve isolation switch to CLOSE.	
b. Check MCB indications for cause of AFW failure:		
1) Verify CST level - GREATER THAN 5 FEET	 Refer to ER-AFW.1. ALTERNATE WATER SUPPLY TO AFW PUMPS. 	
2) Verify busses supplying power to MDAFW pumps - ENERGIZED	 Continue attempts to restore power to MDAFW pumps. 	
• Bus 14 • Bus 16		
3) Determine AFW flow requirements per ATT-22.0. ATTACHMENT RESTORING FEED FLOW		
4) Check AFW valve alignment	 Dispatch AO to locally align valves. 	
o AFW pump discharge valves - OPEN	•	
 MOV-4007 MOV-4008 MOV-3996 		
o TDAFW pump flow control valves – OPEN		
 AOV-4297 AOV-4298 		
This Step continued on the next page.	· ·	

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EOP:	TITLE:		REV: 31
FR-H.1	RESPONSE TO LOSS OF S	ECONDARY HEAT SINK	PAGE 7 of 3
	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	·]
(Step	3 continued from previous pag	ge)	
c. Chec	k AFW pumps - ALL RUNNING	c. Perform the followi	ng:
		1) Manually start M	DAFW pumps.
		 Check TDAFW pump valves OPEN. 	steam supply
		MOV-3504AMOV-3505A	
		3) If necessary dis locally reset TD governor valve.	
		4) <u>IF</u> NO AFW pumps <u>THEN</u> go to Step	
requ	rol AFW flow per irements of ATT-22.0. CHMENT RESTORING FEED FLOW		
	k total flow to S/Gs – TER THAN 200 GPM	e. Continue attempts t flow and go to Step	
f. Retu effe	rn to procedure and step in ct		
4 Stop B	oth RCPs		
* * * * * *	. <u>Cauti</u>	<u>1011</u>	* * * * * * * *
	POWER IS LOST AFTER SI RESET SAFEGUARDS EQUIPMENT. (REFE WER)		-
	* * * * * * * * * * * * * * *	• • • • • • • • • • • • •	
5 Reset	SI If Actuated		
 ·			•

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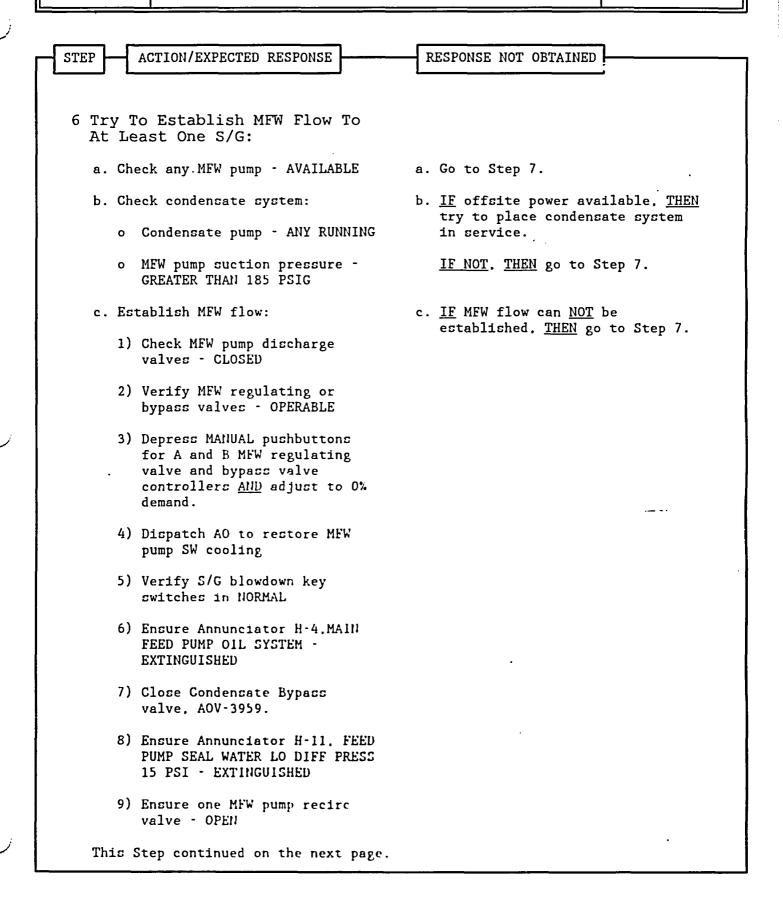
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FR-H.1

TITLE:

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EOP:

EOP: TITLE:	
FR-H.1 RESPONSE TO LOSS	OF SECONDARY HEAT SINK
	PAGE 9 of 31
<u></u>	, <u> </u>
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 6 continued from previou	us page)
10) Start selected MFW pump	F-2-,
	ue]ue
11) Open MFW pump discharge v	
12) Adjust MFW regulating or bypass valves to control flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW	MFW
d. Go to Step 11	
7 Establish SAFW Flow:	
a. Perform the following:	a. <u>IF</u> greater than 200 gpm total SAFW flow can <u>NOT</u> be
1) Align SAFW system for operation (Refer to ATT-S ATTACHMENT SAFW)	established, <u>THEN</u> go to Step 8. 5.1 <i>.</i>
2) Determine SAFW flow requirements per ATT-22.0 ATTACHMENT RESTORING FEED	
3) Start both SAFW pumps	
4) Control SAFW flow per requirements of ATT-22.0 ATTACHMENT RESTORING FEED	
5) Verify SAFW total flow - GREATER THAN 200 GPM	
b. Go to Step 11	
	· · ·

FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK FAGE 10 o STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED IF WIDE RANGE LEVEL IN BOTH S/GS DECREASES TO LESS THAN 50 INCHES [100 INCHES ADVERSE CINT] OR IF PRZE PRESSURE INCREASES TO GREATER THAN 2335 PSIG DUE TO LOSS OF HEAT SINK, THEN STEPS 13 THROUGH 15 SHOULD BE IMMEDIATELY INITIATED FOR BLEED AND FEED. 8 Establish Conditions to Feed S/G(s) From Condensate System: a. Check condensate pumps - ANY RUNNING a. IF offsite power available. THEN manually start at least one condensate pump. IF a condensate pump. IF a condensate pump can NOT be started. THEN go to Step 12. b. Establish condensate flowpath (Refer to ATT-5.0. ATTACHMENT COND TO S/G) a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Any MSIV - OPEN a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Any MSIV - OPEN a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Any MSIV - OPEN a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Any MSIV - OPEN a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Any MSIV - OPEN a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. • Adjust condenser steam dump controller HC-484 in AUTO a. Place S/G ARV controller HC-484 in AUTO	
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LAUTION IF WIDE RANGE LEVEL IN BOTH S/GS DECREASES TO LESS THAN 50 INCHES [100 INCHES ADVERSE CUMT] OR IF PRZR PRESSURE INCREASES TO GREATER THAN 2335 PSIG DUE TO LOSS OF HEAT SINK. THEN STEPS 13 THROUGH 15 SHOULD BE IMMEDIATELY INITIATED FOR BLEED AND FEED. 8 Establish Conditions to Feed S/G(s) From Condensate System: a. Check condensate pumps - ANY RUNNING a. If offsite power available. THEN manually start at least one condensate pump. IF a condensate pump can NOT be started. THEN go to Step 12. b. Establish condenser flowpath (Refer to ATT-5.0. ATTACHMENT COND TO S/G) c. De-energize PRZR heaters 9 Establish Condenser Steam Dump Pressure Control: a. Verify condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO	
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<pre>(Refer to ATT-5.0. ATTACHMENT COND TO S/G) c. De-energize PRZR heaters 9 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available:</pre>	<u>N</u>
 9 Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 10. a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 10. b. Adjust condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO 	
Dump Pressure Control: a. Verify condenser available: a. Place S/G ARV controllers in AUTO at decired pressure and go to Step 10. b. Adjust condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO	
 AUTO at desired pressure and go to Step 10. Annunciator G-15. STEAM DUMP ARMED - LIT Adjust condenser steam dump controller HC-484 to highest S/G pressure Verify condenser steam dump controller HC-484 in AUTO 	
 o Any MSIV - OPEN to Step 10. o Annunciator G-15. STEAM DUMP ARMED - LIT . b. Adjust condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO 	
ARMED - LIT b. Adjust condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO	
controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO	
controller HC-484 in AUTO	
d Place steep dump mode1	
d. Place steam dump mode selector switch to MANUAL	

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EOP: TITLE:	REV: 31
FR-H.1 RESPONSE TO LOSS OF SEC	PAGE 11 of 3:
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTION</u>	* * * * * * * * * * * * * * * * * * * *
FOLLOWING BLOCK OF AUTOMATIC SI ACTUATION REQUIRED IF CONDITIONS DEGRADE.	, MANUAL SI ACTUATION MAY BE
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : If auxiliary spray is in use, spray normal charging valve AOV-294 and n	
10 Establish Condensate Flow to S/G:	
a. Check RCS pressure – GREATER THAN 1950 PSIG	a. Go to Step 10c.
b. Depressurize RCS to less than 1950 psig:	
1) Check letdown - IN SERVICE	 Use one PRZR PORV. <u>IF</u> IA to CNMT, AOV-5392. <u>NOT</u> open, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
	a) <u>IF</u> PORV <u>NOT</u> available, <u>THEN</u> use auxiliary spray valve, AOV-296 and go to step 10c.
2) Depressurize using auxiliary spray valve (AOV-296)	2) Use one PRZR PORV. <u>IF</u> IA to CNMT, AOV-5392, <u>NOT</u> open, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
c. WHEN PRZR pressure less than 1950 psig, THEN place SI block switches to BLOCK	•
• Train A • Train B	
d. Verify SAFETY INJECTION BLOCKED status light - LIT	
This Step continued on the next page.	

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EOP: FR-H.1

TITLE:

RESPONSE TO LOSS OF SECONDARY HEAT SINK

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Stop 10 continued from providing pose)	
(Step 10 continued from previous page)	
e. Stop depressurizing RCS and maintain RCS pressure less than 1950 psig	•
f. Depress MANUAL pushbuttons <u>AND</u> manually adjust MFW regulating or bypass valves to control feed flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW	
g. Dump steam to condenser at maximum rate to depressurize at least one S/G to less than 380 psig	g. Manually or locally dump steam using intact S/G ARV at maximum rate to depressurize at least one S/G to less than 380 psig.
h. Verify condensate flow to S/Gs	h. Go to Step 12.
- 11 Check S/G Levels:	
a. Narrow range level in at least one S/G - GREATER THAN 7% [25% adverse CNMT]	a. <u>IF</u> feed flow verified and level increasing in at least one S/G. <u>THEN</u> maintain flow to restore narrow range level greater than 7% [25% adverse CNMT]. <u>IF NOT</u> verified. <u>THEN</u> go to Step 12.
b. Return to procedure and step in effect	
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EOP: TIT	RESPONSE TO LOSS OF SE	CONDARY UFAT STAR	REV: 31
		CONDARI HEAI SINK	PAGE 13 of
STEP ACTI	ON/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
12 Verify Se	econdary Heat Sink:		
o Eith GREA	the following: Mer S/G level - WIDE RANGE MTER THAN 50 inches) inches adverse CNMT]	 a. <u>IF</u> loss of heat sin indicated. <u>THEN</u> perfollowing: 1) Go to Step 13 to bleed and feed c 	form the initiate
	R pressure – LESS THAN 5 PSIG		
b. Return	to Step 1		
* * * * * * *	<u>CAUTIO</u>	* * * * * * * * * * * * * * * N	* * * * * * * *
KEMUVAL BI KU	S BLEED AND FEED.		
13 Actuate S	S BLEED AND FEED.		
13 Actuate S		Manually start pumps a	
13 Actuate s 14 Verify RC a. Check S	SI and CI CS Feed Path: SI pumps - AT LEAST ONE	Manually start pumps a valves as necessary to RCS feed path.	
13 Actuate s 14 Verify RG a. Check S RUNNING b. Check w operati	SI and CI CS Feed Path: SI pumps - AT LEAST ONE	valves as necessary to	establish be inue attempts
13 Actuate s 14 Verify RG a. Check S RUNNING b. Check w operati	SI and CI CS Feed Path: SI pumps - AT LEAST ONE Valve alignment for ing SI pumps - PROPER	valves as necessary to RCS feed path. <u>IF</u> a feed path can <u>NOT</u> established. <u>THEN</u> cont to establish feed flow	establish be inue attempts
13 Actuate s 14 Verify RG a. Check s RUNNING b. Check w operati	SI and CI CS Feed Path: SI pumps - AT LEAST ONE Valve alignment for ing SI pumps - PROPER	valves as necessary to RCS feed path. <u>IF</u> a feed path can <u>NOT</u> established. <u>THEN</u> cont to establish feed flow	establish be inue attempts
13 Actuate s 14 Verify RG a. Check S RUNNING b. Check w operati	SI and CI CS Feed Path: SI pumps - AT LEAST ONE Valve alignment for ing SI pumps - PROPER	valves as necessary to RCS feed path. <u>IF</u> a feed path can <u>NOT</u> established. <u>THEN</u> cont to establish feed flow	establish be inue attempts
13 Actuate s 14 Verify RG a. Check S RUNNING b. Check w operati	SI and CI CS Feed Path: SI pumps - AT LEAST ONE Valve alignment for ing SI pumps - PROPER	valves as necessary to RCS feed path. <u>IF</u> a feed path can <u>NOT</u> established. <u>THEN</u> cont to establish feed flow	establish be inue attempts

FR-H.1 RESPONSE TO LOSS OF SEC	CONDARY HEAT SINK REV: 31 PAGE 14 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15 Establish RCS Bleed Path:	
a. Open both PRZR PORV block valves	a. Ensure power to MCCs supplying block valves.
	 MCC D for MOV-515 MCC C for MOV-516
	<u>IF</u> any block valve can <u>NOT</u> be opened. <u>THEN</u> dispatch AO to locally check breaker:
	 MOV-515, MCC D position 6C MOV-516, MCC C position 6C
b. Place both PRZR PORV switches to OPEN	
c. Align RCS overpressure protection system to open both PRZR PORVs (Refer to ATT-12.0. ATTACHMENT N2 PORVS)	
d. Verify PORVs - BOTH OPEN	d. <u>IF</u> BOTH PRZR PORVs can <u>NOT</u> be opened. <u>THEN</u> ensure both PORV switches in OPEN.
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EOP: TITLE:	
FR-H.1 RESPONSE TO LOSS OF SEC	
	PAGE 15 of 3
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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<u>IOLTUAD</u>	<u>1</u>
IF OFFSITE POWER IS LOST AFTER SI RESET. TO RESTART SAFEGUARDS EQUIPMENT. (REFER OFFSITE POWER)	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
16 Check If SI Can Be Reset:	
a. Check SI blocked status light - EXTINGUISHED	a. Place SI block switches to UNBLOCK
b. Check the following:	b. <u>IF</u> PRZR pressure stable or
o PRZR pressure - LESS THAN 1750 PSIG	increasing, <u>THEN</u> reset SI and go to Step 17.
- OR -	<u>IF</u> PRZR pressure decreasing, <u>THEN</u> perform the following:
o Either steamline pressure - LESS THAN 514 PSIG	1) <u>WHEN</u> PRZR pressure less than 1750 psig, <u>THEN</u> reset SI.
	2) Go to Step 17.
c. Reset Sl	
17 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26. CONTAINMENT ISOLATION - EXTINGUISHED	b. Perform the following:
	1) Reset SI.
	2) Depress CI reset pushbutton

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FR-H.1 RESPONSE TO LOSS OF SE	CONDARY HEAT SINK PAGE 16 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18 Verify Adequate SW Flow:	
a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
	 <u>IF</u> <u>NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	2) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2. LOSS OF SERVICE WATER.
	3) Go to Step 19.
b. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN	b. Manually align valves.
 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	I

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P: TILE:	REV: 31
FR-H.1 RESPONSE TO LOSS OF SE	CONDARY HEAT SINK PAGE 17 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19 Establish IA to CNMT:	
a. Verify non-safeguards busses energized from offsite power	a. Perform the following:
o Bus 13 normal feed - CLOSED	 Close non-safeguards bus tie breakers:
-OR-	Bus 13 to Bus 14 tieBus 15 to Bus 16 tie
o Bus 15 normal feed – CLOSED	 Verify adequate emergency D/G capacity to run air compressors (75 kw each).
	<u>IF NOT. THEN</u> perform the following:
	o Start diesel air compressor (refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR).
	-OR-
	o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
	3) Start HP seal oil backup pump.
	4) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following:
	 Restore IA using service air compressor <u>OR</u> diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
	2) Go to Step 19d.
This Step continued on the next page.	

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FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK PAGE 18 of STEP AGTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED (Step 19 continued from previous page) c. Perform the following: (Step 19 continued from previous page) c. Perform the following: (Step 19 continue building SW isolation valves - OPEN c. Perform the following: • MOV-4613 and MOV-4670 0 Monually align valves. • MOV-4614 and MOV-4664 0 Isopatch AO to locally reset compressors as necessary. d. Verify adequate air compressor (s) - RUNNING d. Manually start electric air compressors as necessary. e. Check IA supply: e. Check IA supply: o Pressure - GREATER THAN 60 PSIG o. Pressure - STABLE OR INSTRUMENT AIR). o Pressure - STABLE OR INSTRUMENT AIR). 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). c) Continue with Step 21. WHEN IA restored. THEN do Steps 19f. g and 20. 1. MEN IA f. Reset both trains of XY relays for IA to CIMT AOV-5392 - OPEN g. Continue with Step 21. WHEN IA restored to CNNT. THEN do Step 20.	?:		REV: 31
 (Step 19 continued from previous page) c. Verify turbine building SW isolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressor(s) - RUNNING d. Verify adequate air compressor(s) - RUNNING e. Check IA supply: f. Reset both trains of XY relays for IA to CIMMT AOV-5392 g. Verify IA to CIMMT AOV-5392 - OPEN (Step 19 continue with Step 21. WHEN IA restored to CIMMT AOV-5392 - OPEN (Step 19 continue with Step 21. WHEN IA restored to CIMMT, THEN do 	FR-H.1	RESPONSE TO LOSS OF S	
 c. Verify turbine building SW isolation valves - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate sir compressor(s) - RUNNING d. Verify adequate sir compressor(s) - RUNNING d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can <u>NOT</u> be start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). e. Check IA supply: o. Pressure - GREATER THAN 60 PSIG o. Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CHMT AOV-5392 - OPEN g. Verify IA to CHMT AOV-5392 - OPEN c. Perform the following: a. Continue with Step 21. <u>WHEN</u> IA restored to CNMT. <u>THEN</u> do 			
 compressor(s) - RUNNING compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started. <u>THEN</u> start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). e. Check IA supply: e. Perform the following: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 g. Verify IA to CNMT AOV-5392 - OPEN g. Continue with Step 21. <u>WHEN</u> IA restored to CNMT. <u>THEN</u> do 	c. Verd isol • MC	fy turbine building SW Lation valves - OPEN DV-4613 and MOV-4670	 c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset
 o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING f. Reset both trains of XY relays for IA to CNMT AOV-5392 g. Verify IA to CNMT AOV-5392 - OPEN g. Continue with Step 21. WHEN IA restored. THEN do g. Continue with Step 21. WHEN IA restored to CNMT, THEN do 			compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR
for IA to CNMT AOV-5392 g. Verify IA to CNMT AOV-5392 - OPEN g. Continue with Step 21. <u>WHEN</u> IA restored to CNMT, <u>THEN</u> do	0 H 6 0 H	Pressure - GREATER THAN 50 PSIG Pressure - STABLE OR	 Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). Continue with Step 21. <u>WHEN</u> IA restored, <u>THEN</u> do Steps
restored to CNMT, <u>THEN</u> do			
	g. Veri	fy IA to CNMT AOV-5392 - OPE.	restored to CNMT, <u>THEN</u> do

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	FR-H.1	RESPONSE TO LOSS

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: PRZR PORVs may close temporarily restored in CNMT.	until adequate IA pressure is
20 Restore RCS Overpressure Protection System To Standby:	
a. Verify instrument bus D – ENERGIZED	a. Perform the following:
	 Ensure steam dump mode control in MANUAL.
	 Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b. Place PORV PCV-430 and PCV-431C N2 arming switches to BLOCK	
SOV-8619ASOV-8619B	
c. Close PORV PCV-430 and PCV-431C N ₂ SURGE TK VLVs	
• SOV-8616A • SOV-8616B	
	•

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FR-H.1	RESPONSE TO LOSS OF SE	
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
01 Monif	- Planuta DCC Blood	
21 Verify Path:	y Adequate RCS Bleed	Perform the following: a. Open Rx head vent valves.
	e exit T/Cs - STABLE OR REASING	• SOV-590
	JS Level (no RCPs) - GREATER	• SOV-591 • SOV-592
	N 77% [82% adverse CNMT]	• SOV-593
		b. Align any available low pressure water source to intact S/Gs.
		<u>IF</u> no low pressure water source can be aligned. <u>THEN</u> go to Step 22.
		c. Depressurize at least one intact S/G to atmospheric pressure using S/G ARV.
* * * * *	CAUTIO	
		FEED SHALL NOT BE REVERSED WHEN CACTOR TRIP OR SAFETY INJECTION.
* * * * *	* * * * * * * * * * * * * * * * *	
Of E- SAFET	ete Steps 1 through 12 0, REACTOR TRIP OR Y INJECTION, While nuing With This Procedure	
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EOP:	TITLE:		REV: 31
FR-H.1	RESPONSE TO LOSS O	F SECONDARY HEAT SINK	PAGE 21 of
	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	· · · · · · · · · · · · · · · · · · ·
* * * * * *	• • • • • • • • • • • • • • • • • • •	AUTION	* * * * * * * *
	EED PATH MUST BE MAINTAIN MP SHUTOFF HEAD.	ED EVEN IF RCS PRESSURE REMAIN	S GREATER
* * * * *	* * * * * * * * * * * *		* * * * * * * *
23 Mainta	in RCS Heat Removal:		
o Main	tain SI flow		
	tain both PRZR PORVs and k valves – OPEN		
	Normal Power Available rging Pumps:	e Verify adequate emerge capacity to run chargi (75 kw each).	
o Bus CLOS	14 normal feed breaker – ED	<u>IF NOT, THEN</u> evaluate	
o Buz CLOS	16 normal feed breaker – ED	RECIRC fans can be sto to ATT-4.0, ATTACHMENT FANS).	
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EOP: TITLE:	REV: 31
FR-H.1 RESPONSE TO LOSS OF SE	ECONDARY HEAT SINK PAGE 22 of 31
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally close seal injection needle valve(s) to affected RCP: RCP A. V-300A RCP B. V-300B 2) Ensure HCV-142 open, demand at 0%.
 b. Align charging pump suction to RWST: o LCV-112B - OPEN 	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
o LCV-112C - CLOSED	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
c. Start charging pumps as necessary to establish maximum charging flow	
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	EOP: TITLE:	
	FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 31
		PAGE 23 of 31
		<u></u>
·	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	
	CAUTION	* * * * * * *
	 IF RWST LEVEL DECREASES TO LESS THAN 28%. THEN THE SI SYSTEM SHO ALIGNED FOR COLD LEG RECIRCULATION USING STEPS 1 THROUGH 14 OF E TRANSFER TO COLD LEG RECIRCULATION. 	
	• IF CONTAINMENT PRESSURE INCREASES TO GREATER THAN 28 PSIG, CONTA SPRAY SHOULD BE VERIFIED.	\INMENT
	 RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO TH EXCHANGERS. 	IE RHR HEAT
	* * * * * * * * * * * * * * * * * * * *	* * * * * * *
	*26 Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING a. Go to Step 27.	
	b. Check the following: b. Continue with Step 27 conditions satisfied.	
	o CNMT pressure – LESS THAN Steps 26c through 26f 4 PSIG	Ε.
:	o Sodium hydroxide tank level - LESS than 55%	
	c. Reset CNMT spray	
	d. Check NaOH flow (FI-930) - NO d. Place NaOH tank outle FLOW switches to CLOSE.	et valve
	• AOV-836A • AOV-836B	
	e. Stop CNMT spray pumps and place in AUTO	
	f. Close CNMT spray pump discharge .valves	
	 MOV-860A MOV-860B MOV-860B 	
	• MOV-860C • MOV-860D	•

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EOP: FR-H.1	TIRE: RESPONSE TO LOSS OF SI	ECONDARY HEAT SINK
	<u></u>	PAGE 24 of 31
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Establ	ue Attempts To ish Secondary Heat Sink Least One S/G:	
	empt to restore one or more the following:	
• Me • St	FW flow ain FW flow andby AFW flow ondensate flow	
<u>THEN</u> requ	a feed source is available. control feed flow per irements of ATT-22.0, ACHMENT RESTORING FEED FLOW	
28 Check Heat S	For Adequate Secondary _ ink:	
leas	ek narrow range level in at st one S/G - GREATER THAN 7% 4 adverse CNMT)	a. Return to Step 27.
	st S/G ARV controllers to ting S/G pressure	
	<u>CAUTI</u>	<u>011</u>
		REASE IN RCS TEMPERATURE MAY RESULT IN CS HEATUP SHOULD BE PREVENTED.
	• • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
29 Monito	or RCS Temperatures:	Perform the following:
o Core	e exit T/Cc - DECREASING	a. Control steam dump and feed flow
	hot leg temperatures - REASING	to establish natural circulation: . and stabilize RCS temperature.
	THU THA	b. Return to Step 27.

FR-H.1 RESPONSE TO LOSS OF S	ECONDARY HEAT SINK PAGE 25 of 31
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30 Check CCW Pumps - ANY RUNNING	Perform the following:
	a. <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A, MOV-749A and MOV-759A RCP B, MOV-749B and MOV-759B
	b. Manually start one CCW pump (122 kw).
<u>CAUTI</u>	<u>ION</u>
IF RCS IS SOLID. CLOSURE OF HEAD VENTS INCREASE UNLESS RCS TEMPERATURE AND RCS CONTROLLED.	
	* * * * * * * * * * * * * * * * * * * *
31 Verify Reactor Head Vent Valves - CLOSED	Manually close valves.
 SOV-590 SOV-591 SOV-592 SOV-593 	
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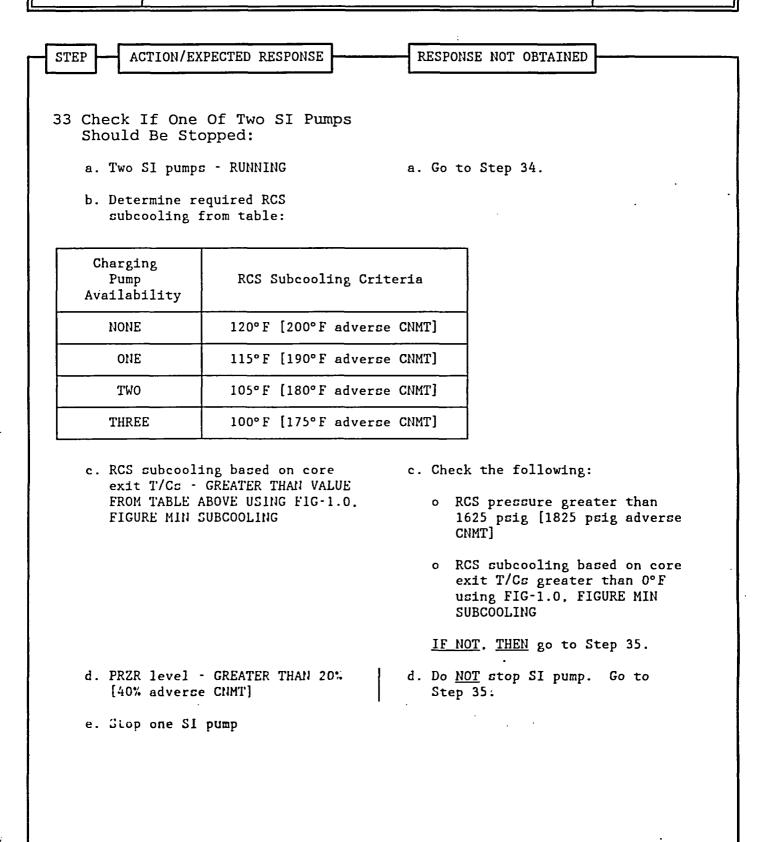
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EOP: FR-H.1	RESPONSE TO LOSS OF SE	CONDARY HEAT SINK
FK-n.1	RESPONSE TO LOSS OF SE	PAGE 26 of
- STEP AC	FION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * * * *		
	CAUTIC	<u>N</u>
	CREASE UNLESS RCS TEMPERATURE	ED AND FEED MAY RESULT IN RAPID RCS AND RCS INFLOW AND OUTFLOW ARE
* * * * * *	* * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
32 Check I	f One Of Three SI	
	hould Be Stopped:	
a. Three	SI pumps – RUNNING	a. Go to Step 33.
	ubcooling based on core	b. Check the following:
	T/Cs – GREATER THAN 35°F adverse CNMT] USING	o RCS pressure greater than
	.0. FIGURE MIN SUBCOOLING	1625 psig [1825 psig adverse CNMT]
		o RCS subcooling based on core
		exit T/Cs greater than O°F using FIG-1.0, FIGURE MIN SUBCOOLING
		IF NOT, THEN go to Step 35.
	PRZR level - GREATER THAN 40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Go to Step 35.
d. Stop	one S1 pump	

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EOP:	
FR-H 1	

TITLE:



EOP:	TIRE:
FR-H.1	RESPONSE

RESPONSE TO LOSS OF SECONDARY HEAT SINK

REV: 31

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	eck If Last SI Pump Should Stopped:	
a.	One SI pump - RUNNING	a. Go to Step 37.
b.	Check the following:	b. Go to Step 35.
	o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0. FIGURE MIN SUBCOOLING	
	o RCS pressure greater than 1625 psig [1825 psig adverse CNMT]	
с.	PRZR level - GREATER THAN 20% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Go to Step 35.
d.	Stop running SI pump	
e.	Go to Step 37	
<u>NOTE</u> :	After closing a PORV, it may be nece increase to permit stopping SI pumps	
	eck PRZR PORVs And sociated Block Valves - ANY	Go to appropriate plant procedure:
	EED PATH OPEN	o <u>IF</u> RWST level greater than 28%, <u>THEN</u> go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT.
		- OR -
		o <u>IF</u> RWST level less than 28%. <u>THEN</u> go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION.

OP:	TITLE: RESPONSE TO LOSS OF	SECONDADY DEAT CINY	REV: 31
FR-H.1	RESPONSE TO LOSS OF	SECONDARI HEAT SINK	PAGE 29 o
STEP AC	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	·]
* * * * * *		• • • • • • • • • • • • • • • • • • •	* * * * * * *
		L RESULT IN RAPID RCS PRESSU AND OUTFLOW ARE CAREFULLY C	
* * * * * *	* * * * * * * * * * * * * *	* * * * * * * * * * * * * *	* * * * * * *
36 Isolat	e PRZR Bleed Paths:	-	
a. PRZR	PORVS - BOTH OPEN	a. Perform the followi	ng:
		 Stop all but one pump. 	charging
		2) Control charging necessary to mai pressure and PRZ	ntain RCS
		3) Establish excess follows:	letdown as
		a) Place AOV-312	to NORMAL.
		b) Ensure CCW pu	mp running.
		c) Manually open excess letdow (AOV-745).	
		d) Ensure excess control valve closed. deman	, HCV-123 is
		e) Reset both tr relays for MO	
		f) Open MOV-313.	
		g) Open excess l isolation val	
		h) Slowly open H	CV-123.
		ge.	

EOP: FR-H.1	TILE: RESPONSE TO LOSS OF SE	REV: 31
rk-n.1	RESPONSE IO LOSS OF SE	PAGE 30 of
STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 3	36 continued from previous pay	ge)
b. Close	e one open PRZR PORV	b. Close PORV block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> go to appropriate plant procedure:
		o <u>IF</u> RWST level greater than 28%. <u>THEN</u> go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT.
		- OR -
		o <u>IF</u> RWST level less than 28%, <u>THEN</u> go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
c. Retu	rn to Step 32	
37 Check H	PRZR PORVS - BOTH CLOSED	Close both PRZR PORVs. <u>IF</u> any PRZR PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
38 Check 1 Stopped	If RHR Pumps Should Be 1:	
	PUMPS - ANY RUNNING IN CTION MODE	a. Go to Step 39.
	k RCS pressure: ressure - GREATER THAN	b. Go to appropriate plant procedure:
25	50 psig [465 pcig adverse NMT]	o <u>IF</u> RWST level greater than 28%, <u>THEN</u> go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
	ressure – STABLE OR NCREASING	Step 1.
		- OR -
		o <u>IF</u> RWST level less than 28%. <u>THEN</u> go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION. Step 1.
c. Stop	RHR pumps and place in AUTO	

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OP:	TIRE:			REV: 31
FR-H.1	RESPONSE TO	LOSS OF SECO	NDARY HEAT SINK	
				PAGE 31 of 3
STEP	ACTION/EXPECTED RES	PONSE	RESPONSE NOT OBTAIN	ED
	· ••••••••••••••••••••••••••••••••••••	الن حب ال		
39 Start	Charging Pumps	As		
Neces	sary And Control			
PRZR	ing Flow To Main Level	itain		
40 Go To	ES-1.1, SI TERM	IINATION,		
Step	0			
		-END	-	

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FR-H.	1

TITLE:

EOP:

PAGE 1 of 1

FR-H.1 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 3) ATTACHMENT COND TO S/G (ATT-5.0)
- 4) ATTACHMENT N2 PORVS (ATT-12.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT SAFW (ATT-5.1)
- 7) ATTACHMENT RESTORING FEED FLOW (ATT-22.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 11) FOLDOUT

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EOP:

RESPONSE TO LOSS OF SECONDARY HEAT SINK

REV: 31

PAGE 1 of 1

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures.

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	TINE:	REV: 8
FR-H.3	RESPONSE TO STEAM GENERATOR HIGH LEVEL	1
		PAGE 1 of 7

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	TITLE:	REV:	8	
FR-H.3	RESPONSE TO STEAM GENERATOR HIGH LEVEL	1.11.	0	
		PAGE	2 of	7

A. PURPOSE - This procedure provides actions to respond to a S/G high level condition and to address the S/G overfill concern.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.3, HEAT SINK Critical Safety Function Status Tree on a YELLOW condition, and
 - b. FR-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE, if the affected S/G narrow range level is high.

EOP:	TITLE:		REV: 8
FR-H.3	RESPONSE TO STEAM GENE	RATOR HIGH LEVEL	PAGE 3 of 7
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
* * * * * *	CAUTION	• • • • • • • • • • • • • • •	* * * * * * *
CNMT]. STEAM S	NARROW RANGE LEVEL HAS INCREASE THEN AN EVALUATION SHOULD BE MA SHOULD NOT BE RELEASED FROM ANY C CNMT] PRIOR TO OVERFILL EVALUA	DE FOR S/G OVERFILL CONSI S/G WITH LEVEL GREATER TH	DERATIONS.
	OVERFILL IS EXPECTED AN ATTEMPT IEL TO PIN MAIN STEAMLINES.	SHOULD BE MADE TO DISPAT	СН
* * * * * *		* * * * * * * * * * * * *	* * * * * * *
	Chroughout this procedure. "affe marrow range level is greater th		n which
	dverse CNMT values should be us greater than 4 psig or CNMT radi		
οI	foldout Page should be open and	monitored periodically.	
	Affected S/G(s) Narrow Level - GREATER THAN 85%	<u>lF</u> less than 85% in all return to procedure and effect.	
2 Verify Affect	FW Isolation To ed S/G(s):		
a. MFW	pumps - TRIPPED	a. Trip MFW pumps.	
b. MFW CLOS	flow control valve(c) – ED	b. Depress MANUAL push manually close valve	
	W regulating valve(c) W bypacc valve(c)		
GREA	fy both S/G pressures - TER THAN CONDENSATE HEADER SSURE	c. Stop any running cor pumps.	ndensate

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EOP:	TITLE:		REV: 8
FR-H.3	RESPONSE TO STEAM GE	NERATOR HIGH LEVEL	PAGE 4 of 7
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	
	AFW And SAFW Flow ol Valves To Affected):	Stop pumps feeding af:	fected S/G(s).
o S/0	; A		
• A	OV-4007 and AOV-4480. MDAFW oump OV-4297, TDAFW pump OV-9701A, SAFW pump		
o S/G	; B		
F	OV-4008 and AOV-4481, MDAFW Dump OV-4298. TDAFW pump		
• 1	OV-9701B, SAFW pump		

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FR-H.3 RESPONSE TO STEAM GENERATOR HIGH LEVEL	
	PAGE 5 of
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Check Affected S/G(s) Level:	
a. Narrow range level – LESS THAN 90% [80% adverse CNMT]	a. Go to Step 5.
b. Narrow range level - DECREASING	b. <u>IF</u> affected S/G level continues to increase, <u>THEN</u> perform the following:
	 Dispatch AO to locally isolate affected S/G:
	o For S/G A, close MFW regulating and bypass
	valve outlet isolation valves. V-3987 and V-3991
	- OR -
	o For S/G B. close MFW
	regulating and bypass valve outlet isolation
	valves, V-3986 and V-3990
	2) Go to Step 5.
c. Control AFW flow to maintain narrow range level between 17% [25% adverse CNMT] and 52%	
d. Return to procedure and step in effect	
	·

FR-H.3 RESPONSE TO STEAM O	GENERATOR HIGH LEVEL
	PAGE 6
	······································
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Adjust Affected S/G(s) ARV Setpoint To 1050 PSIG	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
IF THE TDAFW PUMP IS THE ONLY AVAILAB	TION
SUPPLY TO THE TDAFW PUMP IS THE ONLY AVAILAB	
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
6 Close Affected S/G TDAFW Pump	5
Steam Supply Valve And Place In PULL STOP	
• S/G A. MOV-3505A	
• S/G B, MOV-3504A	_
7 Close Affected S/G(s) MSIV	
And Bypass Valves	
8 Check Affected S/G(s)	IF an E-3 or ECA-3 series proced
Radiation Levels - NORMAL • S/G blowdown, R-19	is in effect, <u>THEN</u> return to procedure and step in effect. <u>I</u> <u>NOT, THEN</u> go to E-3, STEAM
• S/G A, R-31	GENERATOR TUBE RUPTURE, Step 1.
• S/G B. R-32	

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FR-H.3 RESPONSE TO	CULTAN CENTEDAT		REV: 8
FR-H.3 RESPONSE TO) STEAM GENERAI	OK HIGH LEVEL	PAGE 7 of 7
STEP ACTION/EXPECTED RES		RESPONSE NOT OBTAINED	٦
ACTION/EXPECTED RES	FONSE		J
<pre>9 Establish Blowdown Fr Affected S/G(s):</pre>	rom		
a. Reset SI and CI			
b. Reset XY relays for an blowdown valves	ffected S/G		
c. Place blowdown key swi affected S/G to defeat	itch for t		
d. Verify S/G blowdown va	lvec - OPEN		
-			
e. Dispatch AO to establi blowdown to condenser			
tank, as desired (Refe T-14F, STEAM GENERATOP			
SYSTEM STARTUP)			
10 Return To Procedure A In Effect	nd Step		
	- END -		
		•	
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EOP:	TINE:	REV: 8
FR-H.3	RESPONSE TO STEAM GENERATOR HIGH LEVEL	
		PAGE 1 of 1

FR-H.3 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 2) FOLDOUT

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FR-H	.3

EOP:

RESPONSE TO STEAM GENERATOR HIGH LEVEL

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures.

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

	EOP:	TIRE:	REV: 10
	FR-H.5	RESPONSE TO STEAM GENERATOR LOW LEVEL	
			PAGE 1 of 5

GINNA STATION 23 CONTROLLED COPY NUMBER _

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

EOP:	TILE:		REV:	10
FR-H.5	RESPONSE TO S	STEAM GENERATOR LOW LEVEL	PAGE	2 of 5
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- A. PURPOSE This procedure provides actions to respond to a S/G low level condition.
- B. ENTRY CONDITIONS/SYMPTOMS

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- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.3, HEAT SINK Critical Safety Function Status Tree, on a YELLOW condition.

T	II.500					,)
	EOP: FR-H.5	TIME: RESPONSE TO S	TEAM GENEI	RATOR LOW	LEVEL	REV: 10
7						PAGE 3 of 5
\bigcirc						
	STEP A	CTION/EXPECTED RESPONS	Е	RESPONSE N	OT OBTAINED	}7
		* * * * * * * * * * *		* * * * * *	* * * * * *	* * * * * * *
			<u>CAUTION</u>			
	STEAM RELE	ASES FROM AFFECTED S/C	G(S) SHOULD	BE MINIMIZE	D.	
	* * * * * *	* * * * * * * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * * *
		hroughout this procedu arrow range level is 1				which
		dverse CNMT values sho reater than 4 psig or				
	o F	oldout Page should be	open and mo	onitored per	iodically.	
	1 Identi	fy Affected S/G(s)	: .			
		ow range level – LESS 25% adverse CNMT]	THAN	a. Return t effect.	o procedure	and step in
\bigcirc		S/G Blowdown Isol From Affected S/G		Place S/G b switch to C	lowdown valv LOSE.	es master
		738 for S/G A 737 for S/G B		manually, T	an <u>NOT</u> be cl <u>HEN</u> dispatch late blowdow	AO to
				o S/GA, c	lose V-5701	
				o S/GB,c	lose V-5702	
\bigcirc						

ĺ	EOP: FR-H.5	
	FR-H.5	

RESPONSE TO STEAM GENERATOR LOW LEVEL

REV: 10

PAGE 4 of 5

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
 3 Check If Affected S/G(s) Secondary Side Is Intact: o Pressure in affected S/G(s) - STABLE OR INCREASING o Pressure in affected S/G(s) - GREATER THAN 110 PSIG 	<u>IF</u> affected S/G(s) previously identified as faulted, <u>THEN</u> return to procedure and step in effect. <u>IF</u> affected S/G pressure decreasing in an uncontrolled manner or completely depressurized and has not been previously isolated, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
4 Check AFW Flow To Affected S/G(s) - GREATER THAN 50 GPM	IF affected S/G(s) wide range level greater than 50 inches [100 inches adverse CNMT], <u>THEN</u> establish AFW flow as necessary to refill affected S/G(s). IF affected S/G(s) wide range level less than 50 inches [100 inches adverse CNMT], <u>THEN</u> do not establish AFW flow to affected S/G(s). Consult the plant engineering staff to evaluate refilling the affected S/G(s)_as part of long-term plant recovery and go to Step 6.
5 Continue Filling Affected S/G(s) Until Narrow Range Level Greater Than 7% [25% adverse CNMT]	· · · · · · · · · · · · · · · · · · ·

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	EOP: FR-H.5	TITLE:	F TO STEAM	GENERATOR LOW	T.FVFT.	REV:	10	-
	FR-11.5					PAGE	5 of !	5
•								
1	STEP AC	CTION/EXPECTED	RESPONSE	RESPONSE	NOT OBTAINED]	<u> </u>	-
	6 Return In Effe	To Procedur ect	e And Step					
				- END -				
						·		
						-		
	r							
Į					······································	<u> </u>		

EOP:	TITLE:	REV: 10
FR-H.5	RESPONSE TO STEAM GENERATOR LOW LEVEL	
		PAGE 1 of 1

FR-H.5 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 2) FOLDOUT

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EOP:	
FR-H.	5

RESPONSE TO STEAM GENERATOR LOW LEVEL

.

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures.

1. LOSS OF SW CRITERIA

TITLE:

- IF no SW pumps are available, THEN perform the following:
 - a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
 - b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	TITLE:	REV: 12
FR-I.2	RESPONSE TO LOW PRESSURIZER LEVEL	
		PAGE 1 c

GINNA STATION CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

EOP:	TITLE:					REV:	12
FR-I.2		RESPONSE 1	O LOW	PRESSURIZER	LEVEL	PAGE	2 of 8

- A. PURPOSE This procedure provides actions to respond to a low PRZR level.
- B. ENTRY CONDITIONS/SYMPTOMS

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- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.6, INVENTORY Critical Safety Function Status Tree, on a YELLOW condition.

	EOP: TITLE: DECRONSE TO LOW DRI		REV: 12
CAUTION IF ECA-1.1. LOSS OF EMERGENCY COOLANT RECIRCULATION, ECA-3.2, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL. IS IN EFFECT. THIS PROCEDURE SHOULD NOT BE PERFORMED. NOTE: • Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10 ⁺⁰⁵ R/hr. • Foldout Page should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-202) • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Scess Clown isolation valve (AOV-310) 3 Reset CI: • Depress CI reset pushbutton • Perform the following: ISOLATION - EXTINGUISHED 1 Reset SI. • Perform the following: 1) Reset SI.	FR-I.2 RESPONSE TO LOW PRE	LSSURIZER LEVEL	PAGE 3 of 8
LAUTION IF ECA-1.1. LOSS OF EMERGENCY COOLANT RECIRCULATION. ECA-3.2. SGTR WITHOUT PRESSURE CONTROL. IS IN EFFECT. THIS PROCEDURE SHOULD NOT BE PERFORMED. NOTE: • Adverse CNMT values should be used whenever CNMT pressure is greater than 4 pcig or CNMT radiation is greater than 10 ⁺⁰⁵ R/hr. • Foldout Page should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-202) • Letdown orifice valves (AOV-200A. AOV-2010, excess letdown isolation valves (AOV-201) Manually close valves. 3 Reset CI: • Depress CI reset pushbutton b. Perform the following: ISOLATION • EXTINGUISHED 1 Reset SI. 1 Reset SI.			_
<pre>IF ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, OR ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, IS IN EFFECT. THIS PROCEDURE SHOULD NOT BE PERFORMED.</pre> NOTE: • Adverse CNMT values should be used whenever CNMT pressure is greater than 4 prig or CNMT radiation is greater than 10 ⁴⁰⁵ R/hr. • Foldout Fage should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B, and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset puchbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED 1) Reset SI.	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
<pre>IF ECA-1.1. LOSS OF EMERGENCY COOLANT RECIRCULATION. ECA-3.2. SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED. OR ECA-3.3. SGTR WITHOUT PRESSURIZER PRESSURE CONTROL. IS IN EFFECT. THIS PROCEDURE SHOULD NOT BE PERFORMED.</pre> NOTE: • Adverse CNMT values should be used whenever CNMT pressure is greater than 4 prig or CNMT radiation is greater than 10 ⁴⁰⁵ R/hr. • Foldout Page should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26. CNMT ISOLATION • EXTINGUISHED 1) Reset SI.	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * *	
OF REACTOR COOLANT - SATURATED RECOVERY DESIRED. OR ECA-3.3. SCTR WITHOUT PRESSURIZER PRESSURE CONTROL. IS IN EFFECT. THIS PROCEDURE SHOULD NOT BE PERFORMED. NOTE: • Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10 ⁴⁰⁵ R/hr. • Foldout Page should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-421) • Excess letdown isolation valve (AOV-310) 3 Reset. CI: a. Depress CI reset pushbutton b. Perform the following: ISOLATION - EXTINGUISHED 1) Reset SI. 1) Reset SI.	<u>CAUTIO</u>	<u>N</u>	
greater than 4 psig or CNMT radiation is greater than 10 ⁴⁰⁵ R/hr. • Foldout Page should be open and monitored periodically. 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26. CIMT ISOLATION • EXTINGUISHED 1) Reset SI.	OF REACTOR COOLANT - SATURATED RECOVERY D PRESSURIZER PRESSURE CONTROL, IS IN EFFE	DESIRED, OR ECA-3.3, SGTR	WITHOUT
<pre>greater than 4 psig or CNMT radiation is greater than 10⁴⁰⁵ R/hr. o Foldout Page should be open and monitored periodically. Check SI Pumps - ALL STOPPED Return to procedure and step in effect. Verify Normal And Excess Manually close valves. Letdown Isolation Valves - CLOSED Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) Loop B cold leg to REGEN Hx (AOV-427) Excess letdown isolation valve (AOV-310) Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED</pre>	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * *	* * * * * * * *
 1 Check SI Pumps - ALL STOPPED Return to procedure and step in effect. 2 Verify Normal And Excess Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess Letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26. CNMT ISOLATION - EXTINGUISHED b. Perform the following: 1) Reset SI. 	<u>NOTE</u> : o Adverse CNMT values should be us greater than 4 psig or CNMT rad:	sed whenever CNMT pressure iation is greater than 10 ⁻	e 15 +05 R/hr.
effect. 2 Verify Normal And Excess Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress Cl reset pushbutton b. Verify annunciator A-26. CNMT ISOLATION • EXTINGUISHED 1) Reset SI.	o Foldout Page should be open and	monitored periodically.	
Letdown Isolation Valves - CLOSED • Letdown orifice valves (AOV-200A. AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26. CNMT ISOLATION - EXTINGUISHED 1) Reset SI.	1 Check SI Pumps - ALL STOPPED		i step in
AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx (AOV-427) • Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26. CNMT ISOLATION • EXTINGUISHED 1) Reset SI.	Letdown Isolation Valves -	Manually close valves.	
 Excess letdown isolation valve (AOV-310) 3 Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT b. Perform the following: ISOLATION - EXTINGUISHED 1) Reset SI. 	AOV-200B. and AOV-202) • Loop B cold leg to REGEN Hx		
 a. Depress CI reset pushbutton b. Verify annunciator A-26. CNMT b. Perform the following: ISOLATION - EXTINGUISHED 1) Reset SI. 	 Excess letdown isolation valve 		
b. Verify annunciator A-26. CNMT b. Perform the following: ISOLATION - EXTINGUISHED 1) Reset SI.	3 Reset CI:		
ISOLATION - EXTINGUISHED 1) Reset SI.	a. Depress CI reset pushbutton		
1) Reset SI.		b. Perform the following	ng:
2) Depress CI reset pushbutton:	ISOLATION EXTINGUISHED	1) Reset SI.	·
		2) Depress CI reset	pushbutton.

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FR-I.2 RESPONSE TO LOW P	REV: 12
FR-1.2 RESPONSE TO HOW F	PAGE 4 of 8
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Verify Adequate SW Flow:	
a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each).
	<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
	1) Ensure SW isolation.
	 <u>IF</u> <u>NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
	3) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

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	FR-I.2		RESE

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RESPONSE TO LOW PRESSURIZER LEVEL

PAGE 5 of 8

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5 Establish IA to CNMT:	
a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	 a. Perform the following: 1) Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each) IF NOT, THEN perform the
-	 <u>IF NOT</u>, <u>IHEN</u> perform the following: Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	 3) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting. b. Perform the following: Restore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2. ATTACHMENT DIESEL AIR COMPRESSOR). 2) Go to Step 5d.

This Step continued on the next page.

EOP:			
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TITLE:

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RESPONSE TO LOW PRESSURIZER LEVEL

PAGE 6 of 8

ST	EP	[ACTION/EXPECTED RESPONSE	F	ESPONSE NOT OBTAINED
		Ste	on 5 continued from previous page)		
	с.	Ve tu •	ep 5 continued from previous page) erify SW isolation valves to arbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 erify adequate air	c.	 Perform the following: Manually align valves. Dispatch AO to locally reset compressors as necessary. Manually start electric air
			ompressor(s) - RUNNING		compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
	e.	Ch	eck IA supply:	e.	Perform the following:
			Pressure – GREATER THAN 60 PSIG		 Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
		ο	Pressure – STABLE OR INCREASING		2) Continue with Step 6. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 5f and g.
	f.		eset both trains of XY relays or IA to CNMT AOV·5392		
	g.	Ve	rify IA to CNMT AOV-5392 - OPEN		

OP: TITLE:	REV: 12
FR-I.2 RESPONSE TO LO	W PRESSURIZER LEVEL PAGE 7 of
	PAGE / OI
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	· · ·
6 Establish Charging Flow:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch AO to locally close seal injection needle valves to affected RCP. RCP A, V-300A
	 RCP B, V-300B 2) Ensure HCV-142 demand at 0%.
•	 Start one charging pump.
 b. Align charging pump suction t RWST: o LCV-112B - OPEN o LCV-112C - CLOSED 	 b. <u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch A0 to locally open V-358, manual charging pump suction from RWST (charging pump room). <u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following: 1) Direct A0 to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 3) <u>WHEN</u> V-358 open. <u>THEN</u> direct. A0 to close V-268_to isolate- charging pumps B. and C. from. VCT (charging pump.room).
	o Stort odditional character succes
c. Charging flow - ESTABLISHED	c. Start additional charging pumps as necessary.

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FR-I.2	TITLE: RESPONSE TO LOW P	RESSURIZER LEVEL	REV: 12 PAGE 8 of 8
STEP A	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
7 Increa Restor	se Charging Flow To e PRZR Level		
8 Check	PRZR Level:		•
	el - GREATER THAN 10% (30% erse CNMT)	a. Go to step 9.	
b. Leve	1 - STABLE OR INCREASING	b. Go to step 9.	
	1 - GREATER THAN 13% (40% erse CNMT)	c. Return to step 7.	
9 Return In Eff	To Procedure And Step ect		
	-	END-	
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FR-I	2	

EOP:

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PAGE 1 of 1

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FR-I.2 APPENDIX LIST

TITLE

- 1) ATTACHMENT SD-1 (ATT-17.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 3) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 4) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 5) FOLDOUT

TITLE:

	EOP:	TIRE:		-			REV:	12		—
	FR-I.2		RESPONSE 1	CO LOW	PRESSURIZER	LEVEL				
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FOLDOUT PAGE

This Foldout Page applies to all FR-I series procedures. NOTE:

1. LOSS OF SW CRITERIA

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<u>IF</u> no SW pumps are available, <u>THEN</u> perform the following:

- Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. a.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	TITLE:		REV: 20
FR-I.3	RESPONSE TO VOID	S IN REACTOR VESSEL	PAGE 1 of T

GINNA STATION CONTROLLED COPY NUMBER _______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

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EOP:	TITLE:	REV: 20
FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	
		PAGE 2 of 19

- A. PURPOSE This procedure provides actions to respond to voids in the reactor vessel head.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

EOP: TITLE:	REV: 20
FR-I.3 RESPONSE TO VOIDS IN REACTOR VESSEL	PAGE 3 of 19
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	L
SIEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	
CAUTION	* * * * * * *
IF A CONTROLLED NATURAL CIRCULATION COOLDOWN IS IN PROGRESS AND A REACTOR VESSEL UPPER HEAD IS EXPECTED, THIS PROCEDURE SHOULD NOT B	
• • • • • • • • • • • • • • • • • • •	* * * * * * *
<u>NOTE</u> : o Adverse CNMT values should be used whenever CNMT pressure greater than 4 psig or CNMT radiation is greater than 10 ⁺	is 05 R/hr.
o Foldout Page should be open and monitored periodically.	
1 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26, CNMT b. Perform the followin ISOLATION - EXTINGUISHED	g:
1) Reset SI.	
2) Depress CI reset	pushbutton.
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EOP: TITLE:	REV: 20
FR-I.3 RESPONSE TO VOIDS I	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2 Verify Adequate SW Flow To CCW Hx:	
a. Verify at least two SW pumps – RUNNING	 a. Perform the following: 1) Verify adequate power to operate two SW pumps (257 kw per pump).
	<u>IF NOT</u> , <u>THEN</u> shed sufficient non-essential loads. • CNMT RECIRC fans
	 Charging pumps IA compressors PRZR heaters Rx compartment cooling fans Control rod shroud fans
•	 2) Ensure two SW pumps running. 3) <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
	a) <u>IF NO</u> SW pumps running. <u>THEN</u> perform the following:
	 Pull stop any D/G that is not supplied by alternate cooling. <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	2. Refer to ATT-2.4. ATTACHMENT NO SW PUMPS.
	b) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
	c) Go to Step 3.
This Step continued on the next page.	• •

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FR-I.3	RESPONSE TO VOIDS	IN REACTOR	
			PAGE 5 of 1
	/		
STEP ACTION	/EXPECTED RESPONSE	RESPONS	E NOT OBTAINED
. (Step 2 co	ntinued from previous pa	ige)	
b. Verify A valves –	UX BLDG SW isolation OPEN	b. Manua	lly align valves.
	15 and MOV-4734 16 and MOV-4735		
	NMT RECIRC fans	c. Perfo	rm the following:
	tor C-2. HIGH URE ALARM - EXTINGUISHED		termine required SW flow to W HXs per table:
	SW DISCHARGE ALIGNMENT	CCW HXS IN SERVICE	REQUIRED SW FLOW
	Normal	2	Total of 5000 - 6000 gpm equally divided to both HX:
	Normal	1	5000 - 6000 gpm to in-service HX
	Alternate	2	30-33" d/p across each HX
	Alternate	1	95-100" d/p across in-service HX
			rect AO to adjust SW flow required value.
		o	<u>IF</u> on normal SW discharge:
			 V-4619, CCW Hx A V-4620, CCW Hx B
			-OR-
	·	o	<u>IF</u> on alternate SW+ discharge:
			• V-4619C, CCW Hx A.

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FR-I.3 RESPONSE TO VOIDS]	REV: 20
FR-1.5 RESPONSE 10 VOIDS 1	PAGE 7 of 2
STEP ACTION/EXPECTED RESPONSE (Step 3 continued from previous page c. Verify SW isolation valves to	RESPONSE NOT OBTAINED
turbine building - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	 Manually align valves. Dispatch AO to locally reset air compressors as necessary.
d. Verify adequate air compressor(s) – RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started. <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
e. Check IA supply:	e. Perform the following:
o Pressure – GREATER THAN 60 PSIG	 Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
o Pressure - STABLE OR INCREASING	2) Continue with Step 4. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 3f and g.
f. Reset both trains of XY relays for IA to CI valve AOV-5392	
g. Open IA AOV-5392	

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FR-I.3 RESPONSE TO VOIDS IN	
	PAGE 8 of
	·····
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch A0 to close seal injection needle valve(s) to affected RCP:
	• RCP A. V-300A • RCP B. V-300B
	 Ensure HCV-142 open, demand at 0%.
b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
o LCV-112B - OPEN	<u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open
o LCV-112C - CLOSED	V-358, manual charging pump suction from RWST (in charging pump room).
	<u>IF</u> LCV-112C can <u>NOT</u> be closed, <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
c. Start charging pumps as necessary and adjust charging flow to control PRZR level	c. <u>IF</u> at least 20 gpm charging flow can <u>NOT</u> be established, <u>THEN</u> return to procedure and step in effect.

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OP: TITLE:	REV: 20
FR-I.3 RESPONSE TO VOIDS IN	N REACTOR VESSEL PAGE 9 of 1
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Check If Normal CVCS Operation Can Be Established	
a. Verify IA restored: . o IA to CNMT (AOV-5392) - OPEN	a. Continue with Step 8. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 5 through 7.
o IA pressure - GREATER THAN 60 PSIG	
b. Verify instrument bus D – ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available. <u>THEN</u> perform the following:
	1) Verify MCC A energized.
	 Place instrument bus D on maintenance supply.
c. CCW pumps - ANY RUNNING	c. Perform the following:
	 <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s).
	 RCP A. MOV-749A and MOV-759A RCP B. MOV-749B and MOV-759B
	2) Manually start one CCW pump.
6 Verify PRZR Level - GREATER THAN 20% [40% adverse CNMT]	Continue with Step 8. <u>WHEN</u> PRZR level increases to greater than 20% [40% adverse CNMT], <u>THEN</u> do Step 7.

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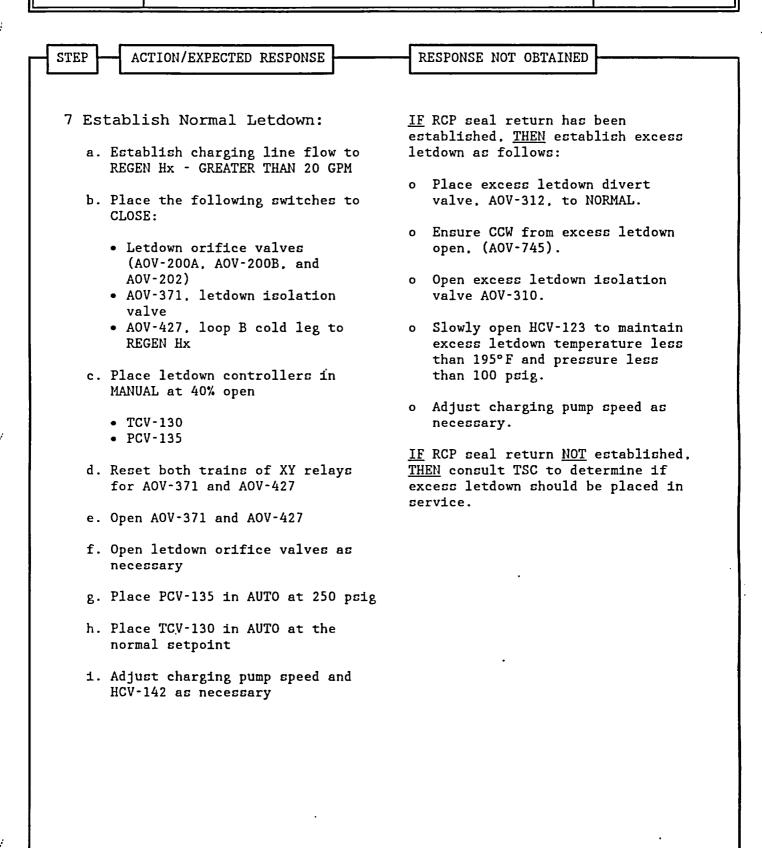
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FR-I.3

TITLE:

EOP:

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PAGE 11 of 19 RESPONSE NOT OBTAINED
DECRONCE NOT OPTICATION
a. Control charging and letdown as necessary to establish the required PRZR level. <u>WHEN</u> PRZR level is greater than 65% [82% adverse CNMT]. <u>THEN</u> continue with step 8b.
b. Energize PRZR heaters and use normal PRZR spray as necessary. <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray valve (AOV-296).
c. Control steam dump and total feed flow as necessary to stabilize RCS temperature.
Go to Step 16.
· • • • • • • • • • • • • • • • • • • •
S PRESSURE SHOULD BE MAINTAINED LESS DINT (410 PSIG).

- 10 Check If RCS Pressure Should Be Increased:
 - a. Pressure AT LEAST 100 PSI BELOW LIMIT ON FIG-9.0. FIGURE TECH SPEC C/D (100°F/HR)
 - b. Energize PRZR heaters to increase RCS pressure by 50 psi

a. Go to Step 13.

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FR-I.3	RESPONSE TO VOIDS I	N REACTOR VESSEL	PAGE	12	of] =
STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]			
As Nece	L Charging And Letdown essary To Maintain PRZR Greater Than 20% [40% e CNMT]					
12 Check I	RVLIS Indication:		·			
a. Leve	l (no RCPs) - INCREASING	a. Go to Step 13.				
b. Leve 95%	l (no RCPs) - GREATER THAN	b. Return to Step 10.				
	off PRZR heaters to ilize RCS pressure					
d. Retu effe	rn to procedure and step in st					

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FR-I.3 RESPONSE TO VOIDS IN REACTOR VESSEL PAGE 13 of STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED CAUTION IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be conditions prior to RCP start: a. IF conditions can NOT be Start One RCP: a. IF conditions can NOT be a. IF conditions can NOT be prior to RCP start: a. IF conditions can NOT be DECOLING Construct PRZR HAN	EOP:	TITLE:	REV: 20
CAUTION IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following conditions prior to RCP start: a. IF conditions can NOT be established. THEN go to Step 16. o PRZR level - GREATER THAN 65% [82% adverse CNMT] a. IF conditions can NOT be established. THEN go to Step 16. o PRZR level - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING a. Energize PRZR heaters as necessary to saturate PRZR water o Bus 11A or 11B - ENERGIZED c. Refer to ATT-15.0. ATTACHMENT RCP START	FR-1.3	RESPONSE TO VOIDS IN REACTOR VESSEL	PAGE 13 of
CAUTION IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following conditions prior to RCP start: a. IF conditions can NOT be established. THEN go to Step 16. o PRZR level - GREATER THAN 65% [82% adverse CNMT] o RCS subcooling based on core exit T/Cc - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCCOLING o Energize PRZR heaters as necessary to saturate PRZR water o Bus 11A or 11B - ENERGIZED o Refer to ATT-15.0. ATTACHMENT RCP START			
<pre>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following a. IF conditions can NOT be conditions prior to RCP start:</pre>	STEP AC	TION/EXPECTED RESPONSE RESPONSE NOT OBTAIL	NED
<pre>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST. THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following a. IF conditions can NOT be conditions prior to RCP start:</pre>	* * * * * *		* * * * * * * * *
NOT BE STARTED PRIOR TO A STATUS EVALUATION. 13 Try To Start One RCP: a. Establish the following conditions prior to RCP start: a. IF conditions can NOT be established. THEN go to Step 16. b. PRZR level - GREATER THAN 65% [82% adverse CNMT] c. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. Energize PRZR heaters as necessary to saturate PRZR water c. Bus 11A or 11B - ENERGIZED c. Refer to ATT-15.0. ATTACHMENT RCP START			
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 conditions prior to RCP start: established. <u>THEN</u> go to Step 16. PRZR level - GREATER THAN 65% [82% adverse CNMT] RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING Energize PRZR heaters as necessary to saturate PRZR water Bus 11A or 11B - ENERGIZED Refer to ATT-15.0. ATTACHMENT RCP START 	13 Try To	Start One RCP:	
 [82% adverse CNMT] RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING Energize PRZR heaters as necessary to saturate PRZR water Bus 11A or 11B - ENERGIZED Refer to ATT-15.0. ATTACHMENT RCP START 	a. Esta cond	blish the following a. <u>IF</u> conditions can itions prior to RCP start: established. <u>THEN</u>	
 exit T/Cs - GREATER THAN 20°F USING FIG-1.0. FIGURE MIN SUBCOOLING Energize PRZR heaters as necessary to saturate PRZR water Bus 11A or 11B - ENERGIZED Refer to ATT-15.0. ATTACHMENT RCP START 			
necessary to saturate PRZR water o Bus 11A or 11B - ENERGIZED o Refer to ATT-15.0. ATTACHMENT RCP START	e: U	kit T/Cs - GREATER THAN 20°F SING FIG-1.0, FIGURE MIN	
o Refer to ATT-15.0. ATTACHMENT RCP START	n	ecessary to saturate PRZR	
RCP START	o B	us 11A or 11B - ENERGIZED	
b. Start one RCP			
	b. Star	t one RCP	
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EOP	FR-I.3 RESPONSE TO VOIDS IN	REACTOR VESSEL	REV: 20
			PAGE 14 of 19
/ F			1
ΓL	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
	14 Check RVLIS Indication	Go to Step 16.	
	o Level (no RCPs) - GREATER THAN 95%	-	
	-OR-		
	o Fluid fraction (any RCP running) - GREATER THAN 97%	· ·	
	15 Go To Step 24		
	16 Direct RP To Start CNMT Hydrogen Monitors		
	17 Check If SI Should Be Blocked:		
	a. PRZR pressure – GREATER THAN 1750 PSIG	a. Go to Step 18.	
	b. PRZR pressure - LESS THAN 1950 PSIG	b. Decrease PRZR pressu than 1950 psig using spray.	
		<u>IF</u> normal spray <u>NOT</u> and letdown in servi auxiliary spray (AOV <u>NOT</u> , <u>THEN</u> use one PR	ce, <u>THEN</u> use . -296). <u>IF</u>
	c. Block SI		

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EOP:	TITLE:		REV: 20
FR-I.3 RESPONSE TO VOIDS IN REACTO		REACTOR VESSEL	
			PAGE 15 of 1
	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAI	INED
18 Record	RCS Pressure and CNMT		
Hydrog	en Concentration on		
ATT-20	.0, ATTACHMENT VENT TIME		
			· · · ·
19 Establ Condit	ish Following RCS ions:		
	level – GREATER THAN 65% adverse CNMT]	a. Control charging necessary to est	ablish the
		required PRZR le level is greater adverse], <u>THEN</u> c step 19b.	
b. RCS	pressure – STABLE	level is greater adverse], <u>THEN</u> c	than 65% [82% ontinue with aters and use
b. RCS	pressure – STABLE -	level is greater adverse], <u>THEN</u> c step 19b. b. Energize PRZR he normal PRZR spra <u>IF</u> normal spray	than 65% [82% ontinue with aters and use y as necessary. <u>NOT</u> available ervice, <u>THEN</u> use
c. RCS exit USIN	pressure - STABLE subcooling based on core T/Cs - GREATER THAN 50°F G FIG-1.0. FIGURE MIN OOLING	level is greater adverse], <u>THEN</u> c step 19b. b. Energize PRZR he normal PRZR spra <u>IF</u> normal spray and letdown in s	than 65% [82% ontinue with aters and use y as necessary. <u>NOT</u> available ervice. <u>THEN</u> use (AOV-296).

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RESPONSE TO VOIDS IN REACTOR VESSEL

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20 Prepare CNMT For Reactor Vessel Venting:	
a. Verify CNMT ventilation isolation valves - CLOSED	a. Manually close valves.
 CNMT MINI PURGE EXH VLVs (AOV-7970, AOV-7971) CNMT MINI PURGE SPLY VLVs (AOV-7445, AOV-7448) CNMT AIR SAMPLE ISO VLVs (AOV-1597, AOV-1598, AOV-1599) 	
b. Verify the following CNMT ventilation equipment in service:	b. Manually start fans as power supply permits.
 All CNMT RECIRC fans One reactor compartment cooling fan One control rod shroud fan 	
21 Determine Maximum Allowable Venting Time:	
a. CNMT hydrogen concentration - LESS THAN 3%	a. Consult TSC to evaluate methods to reduce hydrogen concentration to less than 3%.
b. Determine maximum venting time (Refer to ATT-20.0, ATTACHMENT VENT TIME)	
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	EOP: TITLE:	REV: 20
:	FR-I.3 RESPONSE TO VOIDS IN REACTOR VESSEL	PAGE 17 of 19
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	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED]
	22 Review Reactor Vessel Venting Termination Criteria:	
	o RCS subcooling based on core exit T/Cs -LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING	
	- OR -	
	o PRZR level – LESS THAN 20% [40% adverse CNMT]	
	-OR-	
	o RCS pressure – DECREASES BY 200 PSI	
	- OR -	
	o Venting time – GREATER THAN MAXIMUM TIME CALCULATED IN STEP 21	
	- OR -	
	o RVLIS level (no RCPs) - GREATER THAN 95%	
	- OR -	
	o RVLIS fluid fraction (any RCP running) - GREATER THAN 97%	
	· · · ·	
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EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN	REACTOR VESSEL	REV: 20
			PAGE 18 of 19
			_
STEP A	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	}
* * * * *			* * * * * * *
	CAUTION		
VENTING S EXCEEDED.	SHOULD BE STOPPED IF ANY VENTING T	ERMINATION CRITERION IN	STEP 22 IS
* * * * *	* * * * * * * * * * * * * * * * *	• • • • • • • • • • • •	* * * * * * *
	e reactor vessel head vents should ecifically directed by PORC.	not be opened unless	
23 Vent	Reactor Vessel:		
	en train A Rx vessel head vent lves	a. <u>IF</u> either valve fail <u>THEN</u> close both valv train B valves.	
	SOV - 590 SOV - 592	• SOV-591 • SOV-593	
	y venting termination iterion - EXCEEDED	b. Continue venting. <u>W</u> venting termination exceeded, <u>THEN</u> do St 25 and 26.	criterion is
c. Clo	ose all vent valves		
24 Check	RVLIS Indication -	Increase RCS pressure t recorded in Step 18. R	
o Lev 95%	vel (no RCPs) - GREATER THAN 4	Step 16.	
	- OR -		
	iid fraction (any RCP running) GREATER THAN 97%	·	
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E0P: TIRL: RESPONSE TO VOIDS IN REACTOR VESSEL REV: 20 PAGE 19 of : PAGE 19 of : STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 25 Check PRZR Level - STABLE Control charging and letdown as necessary to stabilize PRZR level. 26 Return To Procedure And Step In Effect -END-	
STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED 25 Check PRZR Level - STABLE Control charging and letdown as necessary to stabilize PRZR level. 26 Return To Procedure And Step In Effect 26 Return To Procedure And Step In Effect	
25 Check PRZR Level - STABLE 26 Return To Procedure And Step In Effect	9 ا
25 Check PRZR Level - STABLE Control charging and letdown as necessary to stabilize PRZR level. 26 Return To Procedure And Step In Effect	
necessary to stabilize PRZR level. 26 Return To Procedure And Step In Effect	
In Effect	
-END-	
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FR-I.3

TITLE:

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FR-I.3 APPENDIX LIST

TITLE

1)	FIGURE MIN SUBCOOLING	(FIG-1.0)
2)	FIGURE TECH SPEC C/D	(FIG-9.0)
3)	FIGURE CNMT HYDROGEN	(FIG-12.0)
4)	ATTACHMENT VENT TIME	(ATT-20.0)
5)	ATTACHMENT RCP START	(ATT-15.0)

- 6) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 7) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 8) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)

9) FOLDOUT

EOP:			
FR-	·I.	3	

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PAGE 1 of 1

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-I series procedures.

1. LOSS OF SW CRITERIA

TITLE:

- IF no SW pumps are available, THEN perform the following:
 - a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
 - b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

---EOP: TITLE: REV: 29 RESPONSE TO IMMINENT PRESSURIZED THERMAL FR-P.1 SHOCK CONDITION PAGE 1 of 23

GINNA STATION CONTROLLED COPY NUMBER ______

RESPONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

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REVIEWED BY:_____

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- A. PURPOSE This procedure provides actions to avoid, or limit, thermal shock or pressurized thermal shock to the reactor pressure vessel, or overpressure conditions at low temperature.
- B. ENTRY CONDITIONS/SYMPTOMS

TITLE:

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.4, INTEGRITY Critical Safety Function Status Tree, on either a RED or ORANGE condition.

.	EOP: TITLE:	REV: 29
; ·	FR-P.1 RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	PAGE 3 of 23
		_ <u>_</u>]
\smile	STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED	D]]
		* * * * * * * * *
	<u>CAUTION</u> IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN SWITCH TO ALTERN	IATE AFW
	WATER SUPPLY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO THE AF	W PUMPS).
		* * *,*'*,* * *
	<u>NOTE</u> : o Adverse CNMT values should be used whenever CNMT pressur greater than 4 psig or CNMT radiation is greater than 10	e 15 0 ⁺⁰⁵ R/hr.
	o Foldout Page should be open and monitored periodically.	
	1 Check RCS Pressure - GREATER IF RHR flow greater th THAN 250 PSIG [465 PSIG THEN return to procedu adverse CNMT] in effect.	
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	• • • • • • • • • • • • • • • • • • •	* * * * * * * * * * * * * * * * * * *
	IF THE TDAFW PUMP IS THE ONLY AVAILABI SUPPLY TO THE TDAFW PUMP MUST BE MAINT	
•		
	2 Check RCS Cold Leg Temperatures - STABLE OR	Try to stop RCS cooldown:
	INCREASING	a. Ensure S/G ARVs closed.
		b. Close both S/G MSIVs.
		c. Ensure MFW flow control valves closed.
		 MFW regulating valves MFW bypass valves
\bigcirc		d. Ensure MFW pumps tripped.
		e. Ensure reheater steam supply valves are closed.
		f. <u>IF</u> S/G pressure less than condensate pressure, <u>THEN</u> stop all condensate pumps.
		g. <u>IF</u> RHR system in service, <u>THEN</u> stop any cooldown from RHR system.
		 h. Control total feed flow to non-faulted S/G(s) greater than 200 gpm until narrow range_level greater than 7% [25% adverse CNMT] in at least one non-faulted S/G. <u>WHEN_S/G</u>[level greater than 7% [25% adverse_ CNMT] in one non-faulted_S/G.
		<u>THEN</u> limit feed flow to stop RCS cooldown.
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TITLE:

RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : A faulted S/G is any S/G that is manner or is completely depressu	
3 Check If S/G Secondary Side Is Intact:	Minimize cooldown from faulted S/G(s):
o Pressure in both S/Gs - STABLE OR INCREASING	a. Close faulted S/G(s) TDAFW pump steam supply valve(s).
o Pressure in both S/Gs - GREATER THAN 110 PSIG	 S/G A. MOV-3505A S/G B. MOV-3504A
	b. <u>IF</u> both S/G(s) faulted. <u>THEN</u> control feed flow at 50 gpm to each S/G.
	c. <u>IF</u> any S/G <u>NOT</u> faulted, <u>THEN</u> isolate all feedwater to faulted S/G unless necessary for RCS temperature control. <u>IF</u> a faulted S/G is necessary for RCS temperature control, <u>THEN</u> control feed flow at 50 gpm to that S/G.
4 Check PRZR PORV Block Valves:	. <u> </u>
a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV:
	unless block valve was closed to
	unless block valve was closed to isolate an open PORV: • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
AVAILABLE	unless block valve was closed to isolate an open PORV: • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C · b. Open one block valve unless it was closed to isolate an open

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FR-P.1	RESPONSE TO IMMINENT P		REV: 29
	SHOCK C	ONDITION	PAGE 6 of 2
			_
STEP AC	TION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
	CAUTIC	<u>N</u>	* * * * * * * *
	R PORV OPENS BECAUSE OF HIGH F AFTER PRESSURE DECREASES TO LE		
PERFORMED .	AFIER FRESSURE DECREASES IV LE	55 IRAN IRE APPLICADLE PU	KV SEIPOINI.
* * * * * *		* * * * * * * * * * * *	* * * * * * * * *
5 Check	PRZR PORV Status:		
	k Reactor Vessel pressure Protection System -	a. Go to Step 5d.	
	ERVICE		
b. Chec 410	k RCS pressure – LESS THAN PSIG	b. Perform the followi	.ng:
		1) Ensure at least open.	one PRZR PORV
		2) Continue with St pressure less th <u>THEN</u> do Step 5e.	an setpoint,
c. Go t	o Step 5e	·	
	pressure - LESS THAN PSIG	d. Perform the followi	ing:
	1516	 Ensure at least open. 	one PRZR PORV
		2) Continue with St pressure less th <u>THEN</u> do Step 5e.	an setpoint,
e. Veri	fy PRZR PORVE - CLOSED	e. Manually close valv	/e.
		<u>IF</u> any valve can <u>NO</u> <u>THEN</u> manually close valve.	

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6 Check SI Pumps - ANY RUNNING	Go to Step 14.
7 Check If SI Can Be Terminated:	Perform the following:
 RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIG-1.0. FIGURE MIN SUBCOOLING Check RVLIS indication: Check RVLIS indication: Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] -OR- Fluid fraction (any RCP running) - GREATER THAN 84% 	 a. <u>IF</u> RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0. FIGURE MIN SUBCOOLING and no RCP running. <u>THEN</u> attempt to start an RCP: 1) Establish conditions for starting an RCP: o Bus 11A or 11B energized o Refer to ATT-15.0. ATTACHMENT RCP START 2) <u>IF</u> conditions established. THEN start one RCP.
	b. Go to Step 28.
<u>CAUTION</u> IF OFFSITE POWER IS LOST AFTER SI RESET. TO RESTART SAFEGUARDS EQUIPMENT. (REFER OFFSITE POWER)	THEN MANUAL ACTION MAY BE REQUIRED
* * * * * * * * * * * * * * * * * * * *	
8 Reset SI	• .
8 Reset SI	• .
8 Reset SI	• .
8 Reset SI	

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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9 Stop SI And RHR Pumps And Place In AUTO	
10 Reset CI:	
a. Depress CI reset pushbutton	
b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following:
IDODATION BATHOOTOMB	1) Reset SI.
	2) Depress CI reset pushbutton.
11 Verify Adequate SW Flow:	
a. Check at least two SW pumps – RUNNING	a. Manually start SW pumps as power supply permits (257 kw each).
	<u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:
	1) Ensure SW isolation.
	 <u>IF</u> <u>NO</u> SW pumps running, <u>THEN</u> perform the following:
	a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
	b) Refer to ATT-2.4. ATTACHMENT_NO SW PUMPS.
	3) <u>IF</u> only one SW pump running. <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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12 Establish IA to CNMT:	
 a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	 a. Perform the following: Close non-safeguards bus tie breakers: Bus 13 to Bus 14 tie Bus 15 to Bus 16 tie 2) Verify adequate emergency D/C capacity to run air compressors (75 kw each). <u>IF NOT</u>. <u>THEN</u> perform the following: Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) <u>WHEN</u> bus 15 restored. <u>THEN</u> reset control room lighting.
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	 b. Perform the following: 1) Restore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
	2) Go to Step 12d.

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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(Step 12 continued from previous pag	e)
 c. Verify SW isolation values to turbine building - OPEN MOV-4613 and MOV-4670 MOV-4614 and MOV-4664 d. Verify adequate air compressor(s) - RUNNING 	 c. Perform the following: Manually align valves. Dispatch AO to locally reset compressors as necessary. d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can NC be started. THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e. Check IA supply:	e. Perform the following:
o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR	 Continue attempts to restore IA (Refer to AP-IA.1, LOSS (INSTRUMENT AIR).
INCREASING	2) Continue with Step 13. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 12f and g.
f. Reset both trains of XY relays for IA to CNMT AOV-5392	
g. Verify IA to CNMT AOV-5392 - OPEN	

FR-P.1 RESPONSE TO TRATILENT T	ONDITION PAGE 11 0
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	 <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch A0 to locally close seal injection needle valve(s) to affected RCP:
	 RCP A, V-300A RCP B, V-300B
	 Ensure HCV-142 open, demand at 0%.
 b. Align charging pump suction to RWST: o LCV-112B - OPEN 	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
o LCV-112C - CLOSED	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
	 Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
	2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
	3) <u>WHEN_V-358</u> open, <u>THEN</u> direct AO to close V-268 to isolate charging:pumps B and C from VCT (charging pump room).
c. Start charging pumps as necessary to establich charging line flow to REGEN HX - GREATER THAN 20 GPM	

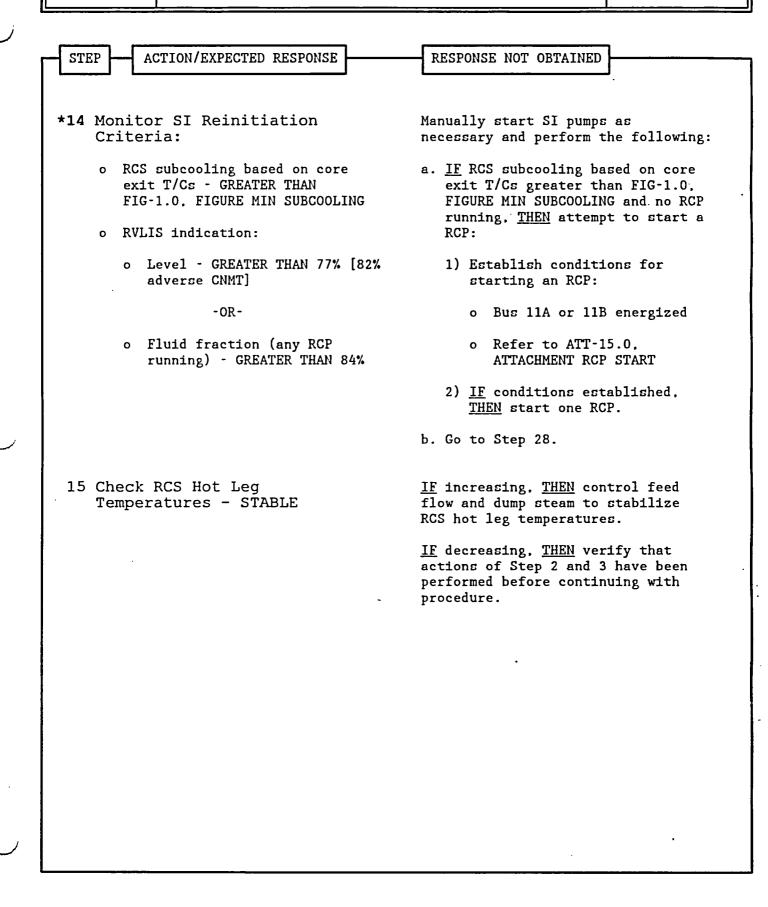
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EOP:

RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

REV: 29

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FR-P.1

TITLE:

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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6 Check If SI ACCUMs Should Be Isolated:	
a. Check the following:	a. Return to Step 14.
o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	
o RVLIS indication:	
o Level – GREATER THAN 77% [82% adverse CNMT]	
- OR -	· · · · ·
o Fluid fraction (any RCP running) - GREATER THAN 84%	
b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves	
 MOV-841. MCC C position 12F MOV-865. MCC D position 12C 	
c. Close SI ACCUM discharge valves	c. Vent any unisolated ACCUMs:
• MOV-841 • MOV-865	 Open vent valves for unisolated SI ACCUMs.
	 ACCUM A. AOV-834A ACCUM B. AOV-834B
	2) Open HCV-945.
	 Continue with Step 17. Do <u>NOT</u> decrease RCS pressure to less than unisolated ACCUM pressure.
	<u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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CAUTIO	<u>,</u>
• THE RCS SHOULD NOT BE DEPRESSURIZED T SI ACCUMS ISOLATED.	O LESS THAN SI ACCUM PRESSURE UNTIL
• THE UPPER HEAD REGION MAY VOID DURING RUNNING. THIS WILL RESULT IN A RAPIN	G RCS DEPRESSURIZATION IF RCPS ARE NOT DLY INCREASING PRZR LEVEL.
	· * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : o If auxiliary spray is in use, a closing normal charging valve A	spray flow may be increased by AOV-294 and normal PRZR spray valves.
o When using a PRZR PORV select o	one with an operable block valve.
17 Depressurize RCS To Decrease RCS Subcooling:	
a. Depressurize using normal PRZR spray if available	a. <u>IF</u> normal spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.
	<u>IF</u> no PRZR PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296).
b. Depressurize RCS until one of the following conditions satisfied:	
o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING	
-OR-	
o PRZR level - GREATER THAN 75% [65% adverse CNMT]	
-OR-	
o RCS pressure – LESS THAN 160 psig [200 psig adverse CNMT]	
c. Stop RCS depressurization	

EOP:	TITLE:			REV: 29
FR-P.1	RESPONSE TO IMMINEN	SSURIZED THERMAL DITION	PAGE 15 of 2	
<u>[</u>			<u></u>	
	TAN ANDREAD DECRANCE			
STEP AC	TION/EXPECTED RESPONSE		RESPONSE NOT OBTAINED	
*18 Monitor	RCP Operation:			
a. RCPs	- ANY RUNNING		a. Go to Step 19.	
b. Check	the following:		b. Stop affected RCP(s).
1	CP #1 seal D/P – GREATER MAN 220 PSID			
TH	CP #1 seal leakoff - WITH E NORMAL OPERATING RANGE CG-4.0, FIGURE RCP SEAL CAKOFF			
	• • • • • • • • • • • • • • • • • • •	AUTION	* * * * * * * * * * *	* * * * * * * *
RCS PRESSUR	IN RCS PRESSURE MAY RESU E AND TEMPERATURE SHOULD STEPS IN THIS PROCEDURE.			
* * * * * *	* * * * * * * * * * * * *	* * * *	* * * * * * * * * * *	* * * * * * * *
	RZR Level - GREATER 양 [40% adverse CNMT]		Try to restore level w while maintaining stab pressure. <u>IF</u> level ca restored, <u>THEN</u> go to S	le RCS n <u>NOT</u> be
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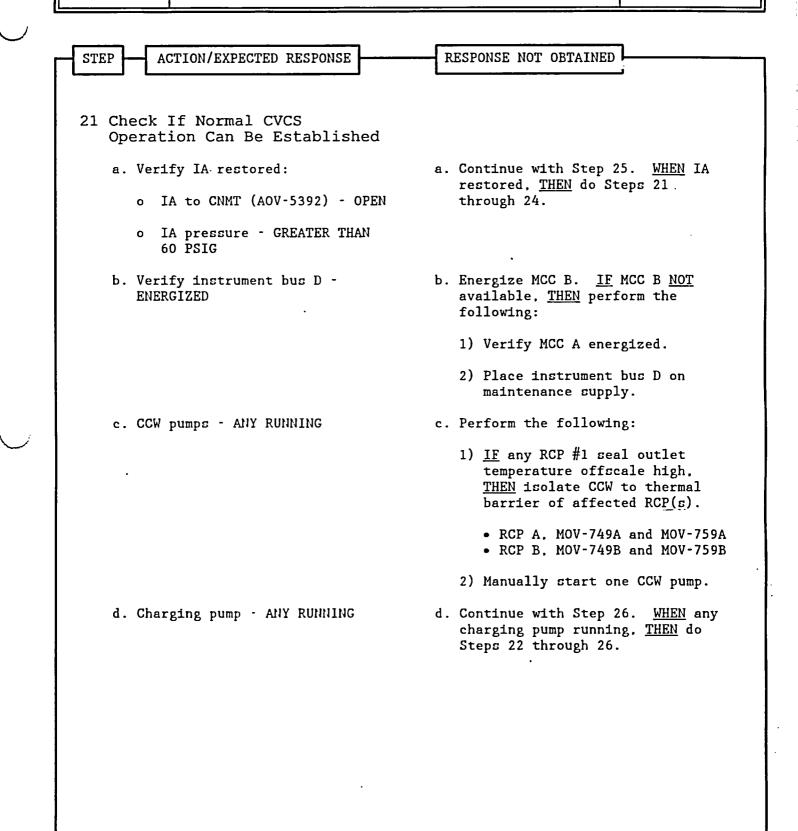
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	erify Adequate SW Flow To W Hx:	
a.	Verify at least two SW pumps – RUNNING	a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated. <u>THEN</u> perform the following:
		 <u>IF</u> <u>NO</u> SW pumps running, <u>THEN</u> perform the following:
		a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
		b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.
		2) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER.
		3) Go to Step 25.
		<u>WHEN</u> two SW pumps can be operated <u>THEN</u> do Steps 21 through 24:
Ъ.	Verify AUX BLDG SW isolation valves - OPEN	b. Manually align valves.
	 MOV-4615 and MOV-4734 MOV-4616 and MOV-4735 	•
c.	Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Manually start an additional SW pump as power supply permits (257 kw each).

RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION REV: 29

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FR-P.1 TITLE: FR-P.1 RESPONSE TO IMMINENT PR SHOCK CO	
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>CAUTION</u> IF RCS PRESSURE LESS THAN 250 PSIG, THEN	
ESTABLISH DESIRED LETDOWN FLOW, NOT TO IN	
22 Establish Normal Letdown: a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM	<u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:
b. Place the following switches to CLOSE:	o Place excess letdown divert valve, AOV-312, to NORMAL.
 Letdown orifice values (AOV-200A. AOV-200B. and AOV-202) AOV-371. letdown isolation value AOV-427. loop B cold leg to REGEN Hx 	 o Ensure CCW from excess letdown open, (AOV-745). o Open excess letdown isolation valve AOV-310. o Slowly open HCV-123 to maintain excess letdown temperature less
c. Place letdown controllers in MANUAL at 40% open • TCV-130	than 195°F and pressure less than 100 psig. o Adjust charging pump speed as necessary.
• PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427	<u>IF</u> RCP seal return <u>NOT</u> established. <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.
e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as	
necessary g. Place PCV-135 in AUTO at 250 psig	
h. Place TCV-130 in AUTO at the normal setpoint i. Adjust charging pump speed and	
HCV-142 as necessary	

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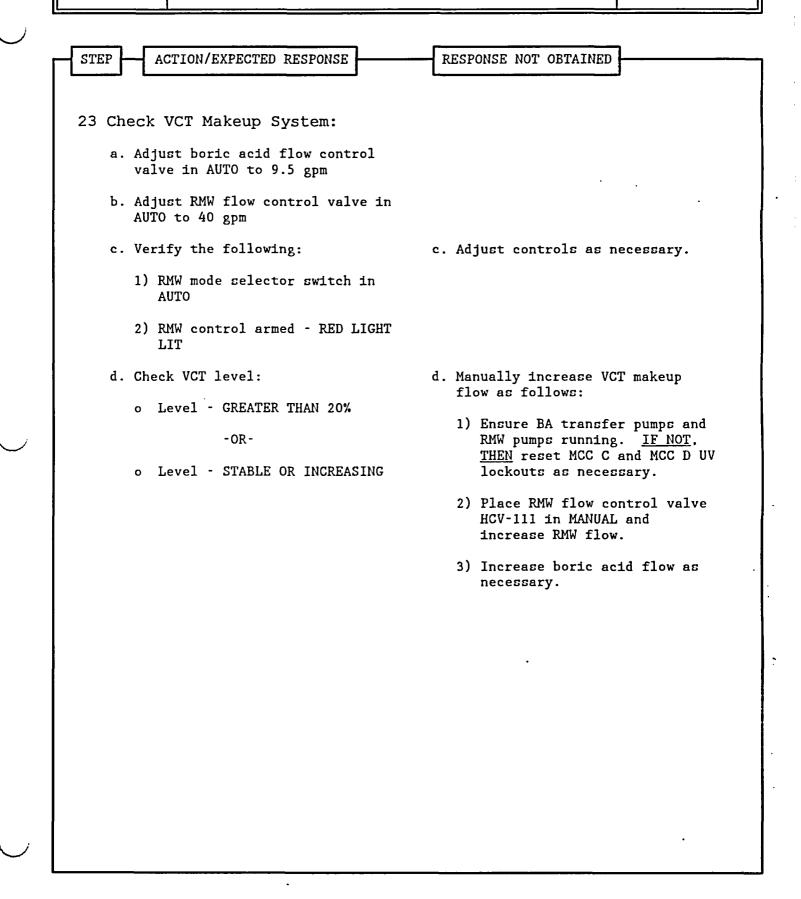
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FR-P.1

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION



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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

REV: 29

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24 Check Charging Pump Suction Aligned To VCT:	
a. VCT level - GREATER THAN 20%	 a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following: 1) Ensure charging pump suction aligned to RWST
	o LCV-112B open o LCV-112C closed
	2) Continue with Step 25. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 24b.
b. Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
o LCV-112C - OPEN	
o LCV-112B - CLOSED	
25 Check PRZR Level - LESS THAN 75% [65% adverse CNMT]	Control charging and letdown as necessary to reduce PRZR level to less than 75% [65% adverse CNMT]. If necessary establish excess letdown.
	<u>IF</u> no letdown available <u>AND</u> CCW to RCPs established. <u>THEN</u> cycle charging pumps as necessary to control PRZR level.

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	FR-P.1

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE</u> : For optimum long term pressure con be restored in the PRZR.	trol, saturated conditions should
26 Verify PRZR Liquid Temperature (TI-424) - AT SATURATION FOR DESIRED PRESSURE	<u>IF</u> PRZR liquid temperature low, <u>THEN</u> energize PRZR heaters as necessary to establish desired temperature.
27 Check RCS Subcooling Based On Core Exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING	<u>IF</u> RCS pressure less than 160 psig [200 psig adverse CNMT], <u>THEN</u> go to Step 28. <u>IF NOT, THEN</u> depressurize using normal spray. Return to step 17b.
-	<u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray for any further depressurization. Return to Step 17b.
	<u>IF</u> auxiliary spray <u>NOT</u> available, <u>THEN</u> return to Step 17a.
28 Check Cool Down Rate In RCS Cold Legs - GREATER THAN 100°F IN ANY 60 MINUTES PERIOD	Return to procedure and step in effect.
29 Maintain RCS Pressure And Temperature Stable For At Least 1 Hour	
a. Control steam dump and feed flow as necessary	
b. Perform actions of other procedures in effect which do not cool down the RCS or increase RCS pressure until the RCS temperature soak has been completed	

FR-P.1

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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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Π	STE	<u>_</u>			XPECTED RESP(JNSE		SPUNS.	E NOT OB	TAINED		
	<u>NOT</u>	<u>E</u> :			ing pressure, in subsequen			cooldo	own rate	limits	remain	I
	30	<u>TH</u> An	<u>EN</u> d I	Continu	Soak Is Co le RCS Cool lrization A	down						
		а.	le; li:	g tempera	CS pressure a ature within FIG-11.0, FIG	the						
		Ь.	ra TH	te in RCS	and maintain 5 cold legg – IN ANY 60 MIN	LESS						
	31	Ve	rif	y SI FI	low Not Req	uired:		ually essary	start SI V.	pumps	85	
		ο	ex:	it T/Cs	ling based on – GREATER THA IGURE MIN SUB	N	<u>IF</u>] exi	- RCS ຮເ t T/Cs	ubcooling s greater IN SUBCOO	than 1	FIG-1.0).
		0	RV.	LIS indic	cation:				<u>THEN</u> per			
			ο	Level – adverse	GREATER THAN CNMT]	77% [82%			lish cond ing an RC		for	
					-OR-			o Bus	s 11A or	11B end	ergized	l
			ο	Fluid fr	raction (any) - GREATER T	RCP HAN 84%	•		fer to Al P START	T-15.0	, ATTAC	HMENT
									nditions one RCP.		ished,	<u>THEN</u>

EOP	FR-P.1	TITLE: RESPONSE T		PRESSURIZED CONDITION	THERMAL	REV: 29 PAGE 23 of	2
с <u> </u>							
ΓL	STEP AC	CTION/EXPECTED F	ESPONSE	RESPONSE	NOT OBTAINED		
	32 Return In Effe	To Procedure ect	And Step				
		•		- END -			
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EOP:

TITLE:

FR-P.1_APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE SOAK LIMITS (FIG-11.0)
- 3) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 4) ATTACHMENT RCP START (ATT-15.0)
- 5) ATTACHMENT SD-1 (ATT-17.0)
- 6) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 7) ATTACHMENT N2 PORVS (ATT-12.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 10) FOLDOUT

FR-P.1

EOP:

PAGE 1 of 1

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-P series procedures.

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP:	-
FR-P.2	

RESPONSE TO ANTICIPATED PRESSURIZED THERMAL. SHOCK CONDITION

PAGE 1 of 6

GINNA STATION 23

CONTROLLED COPY NUMBER ____

RESPONSIBLE MANAGER

<u>/1-17-2004</u> EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

EOP:	TITLE:					D			
FR-P.2	RESPONSE	то	ANTICIPATED	PRESSURIZED	THERMAL	REV:	9		
FR-F.Z			SHOCK (CONDITION		PAGE	2	of	6

- A. PURPOSE This procedure provides actions to respond to a limited overcooling condition or to an overpressure condition at low temperature.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS This procedure is entered from:
 - a. F-0.4, INTEGRITY Critical Safety Function Status Tree, on either branch YELLOW condition.

EOP:	<u>.</u>
F	R-P.2

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RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

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PAGE 3 of 6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED			
	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED			
* * * *	CAUTION	* * * * * * * * * * * * * * * * * * * *			
	IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, THEN STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G.				
<u>NOTE</u> : (<u>NOTE</u> : o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10 ⁺⁰⁵ R/hr.				
	o Foldout Page should be open and m	onitored periodically.			
	Check RCS Cold Leg Temperatures - STABLE OR	Try to stop RCS cooldown:			
	REASING	a. Ensure S/G ARVs closed.			
		b. Close both S/G MSIVs.			
		c. Ensure MFW flow control valves closed.			
		 MFW regulating values MFW bypass values 			
		d. Ensure MFW pumps tripped.			
		e. <u>IF</u> S/G pressure less than condensate pressure, <u>THEN</u> stop . all condensate pumps.			
		f. <u>IF</u> RHR system in service, <u>THEN</u> stop any cooldown from RHR system.			
		g. Control total feed flow to non-faulted S/G(s) greater than 200 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one non-faulted S/G. <u>WHEN</u> S/G level greater than 7% [25% adverse CNMT] in one non-faulted S/G. <u>THEN</u> limit feed flow to stop RCS cooldown.			

•	FR-P.2					
•	SHOCK CC	DNDITION PAGE 4 of 6				
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	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
	<u>NOTE</u> : A faulted S/G is any S/G that is depressurizing in an uncontrolled manner or is completely depressurized.					
	2 Check If SG Secondary Side Is Intact:	Minimize cooldown from faulted S/G(s):				
	o Pressure in both S/Gs - STABLE OR INCREASING	a. Close faulted S/G(s) TDAFW pump steam supply valve(s).				
	o Pressure in both S/Gs - GREATER THAN 110 PSIG	 S/G A, MOV-3505A S/G B, MOV-3504A 				
		b. <u>IF</u> both S/G(s) faulted, <u>THEN</u> control feed flow at 50 gpm to each S/G.				
\bigcirc		c. <u>IF</u> any S/G <u>NOT</u> faulted, <u>THEN</u> isolate all feedwater to faulted S/G(s) unless necessary for RCS temperature control. <u>IF</u> a faulted S/G is necessary for RCS temperature control, <u>THEN</u> control feed flow at 50 gpm to that S/G.				
	3 Check If SI Has Been Terminated - NO SI PUMPS RUNNING	Go to Step 7.				
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RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

PAGE 5 of 6

	STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED		
	CAUTION	* * * * * * * * * * * * * * * * * * * *		
	IF RHR NORMAL COOLING IN SERVICE. THEN RCS PRESSURE SHOULD BE MAINTAINED LESS THAN THE RCS OVERPRESSURE PROTECTION SETPOINT (410 PSIG).			
		* * * * * * * * * * * * * * * * * * * *		
		<u>IF</u> normal RHR cooling <u>NOT</u> in service, <u>THEN</u> verify the following:		
	-	o MOV-700 or MOV-701 closed		
		o MOV-720 or MOV-721 closed		
		<u>IF</u> normal RHR cooling in service, <u>THEN</u> perform the following:		
		a. Reduce RCS pressure to less than 410 psig.		
		b. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT <u>AND</u> OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)		
	LIMITS OF FIG-9.0, FIGURE TECH SPEC C/D FOR 100°F/HR	Decrease RCS pressure to within limits of FIG-9.0, FIGURE TECH SPEC C/D using normal PRZR spray. <u>IF</u> normal spray <u>NOT</u> available and letdown is in service. <u>THEN</u> use auxiliary spray. <u>IF</u> auxiliary spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available for PORV, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.		
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FR-P.2	RESPONSE TO ANTICIPATED P SHOCK CO		REV: 9 PAGE 6 of
			1
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED	
Coo	ermine If Additional RCS ldown Restrictions Are uired:		
(Cooldown rate in RCS cold legs - GREATER THAN 100°F IN ANY 50 MINUTES PERIOD	a. Additional restricti required. Go to Ste	
	RCS cooldown is permitted with the following restrictions:		
:	l) Maintain RCS pressure and cold leg temperatures within the limits of FIG-9.1, FIGURE C/D LIMITS		
:	2) Maintain cooldown rate in RCS cold legs less than 100°F in any 60 minutes period		
	urn To Procedure And Step Effect		
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FR-P.2

EOP:

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FR-P.2 APPENDIX LIST

<u>TITLE</u>

TITLE:

- 1) FIGURE TECH SPEC C/D (FIG-9.0)
- 2) FIGURE C/D LIMITS (FIG-9.1)
- 3) ATTACHMENT N2 PORVS (ATT-12.0)
- 4) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 5) FOLDOUT

FR-P.2

EOP:

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-P series procedures.

1. LOSS OF SW CRITERIA

TITLE:

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

TITLE: EOP: REV: 17 FR-S.1 RESPONSE TO REACTOR RESTART/ATWS PAGE 1 of 13

GINNA STATION CONTROLLED COPY NUMBER 23

PONSIBLE MANAGER

11-17-2004 EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

EOP:		REV: 17
FR-S.1	RESPONSE TO REACTOR RESTART/ATWS	
		PAGE 2 of 13

A. PURPOSE - This procedure provides actions to add negative reactivity to a core which is observed to be critical when expected to be shut down.

B. ENTRY CONDITIONS/SYMPTOMS

- 1. ENTRY CONDITIONS This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, when reactor trip is not verified and manual trip is not effective.
 - b. F-0.1, SUBCRITICALITY, Critical Safety Function Status Tree on either a RED or ORANGE condition.

•	EOP: FR-S.1	TITLE: BESPONSE TO BEA	CTOR RESTART/ATWS	REV: 17
•	FR-5.1			PAGE 3 of 13
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		CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
	<u>NOTE</u> : Adve than	rse CNMT values should be us 4 psig or CNMT radiation is	sed whenever CNMT pressure is s greater than 10 ⁺⁰⁵ R/hr.	greater
	1 Verify	Reactor Trip:	Manually trip reactor.	
,		east one train of reactor breakers - OPEN	<u>IF</u> reactor trip breaker <u>THEN</u> manually insert co	
	o Neut	ron flux - DECREASING		
		indicates - ALL CONTROL ANI DOWN RODS ON BOTTOM)	
	2 Verify CLOSED	Turbine Stop Valves -	Manually trip turbine.	
			<u>IF</u> turbine trip can <u>NOT</u> verified, <u>THEN</u> close bo	
\cup	3 Check	AFW Pumps Running:		
	aMDAF	W pumps - RUNNING	a. Manually start MDAFW	pumps.
		W pump - RUNNING 1F SSARY	b. Manually open steam valves.	supply
			MOV-3505AMOV-3504A	
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FR-S.1	

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RESPONSE TO REACTOR RESTART/ATWS

PAGE 4 of 13

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	CAUTIO	
	1 THROUGH 12 OF E-0, REACTOR TRIP	SHALL NOT BE REVERSED WHEN PERFORMING OR SAFETY INJECTION.
* * *		
<u>NOTE</u> :	o If offsite power is lost coincid lockout relays must be reset to	ident with SI, then MCC C and MCC D o restore BA and RMW pumps.
	o Foldout page should be open and	l monitored periodically.
	itiate Emergency Boration RCS:	
a.	Check SI status:	a. Perform the following:
	o All SI annunciators - EXTINGUISHED	1) Complete steps 1 through 12 of E-O, REACTOR TRIP OR SAFETY INJECTION, while
	o All SI pumps - OFF IN AUTO	continuing with this procedure
		2) <u>IF</u> SI flow indicated, <u>THEN</u> go to Step 5. <u>IF NOT</u> , <u>THEN</u> go to Step 4b.
Ъ.	Verify at least one charging	b. Perform the following:
	pump - RUNNING	1) Reset SI if necessary.
		2) Start one charging pump.
c.	Align boration path:	c. Initiate normal boration at
	1) Start two BA transfer pumps	maximum rate using the boric acid flow control valve. FCV-110A. <u>IF</u> flow can <u>NOT</u> be
	2) Open MOV-350	established, <u>THEN</u> refer to ER-CVCS.1, REACTOR MAKEUP
	3) Verify BA flow	CONTROL MALFUNCTION.
d.	Verify charging flow path:	d. Manually align valves and verify flow.
	o Charging valve to loop B cold leg (AOV-294) - OPEN	110w.
	o Charging flow control valve (HCV-142) - DEMAND AT 0%	

FR-S.1 RESPONSE TO READ	TOR RESTART/ATWS PAGE 5 c
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Check PRZR PORV Status:	
a. RCS pressure – LESS THAN 2335 PSIG	a. Verify PRZR PORVs and block valves open. <u>IF NOT, THEN</u> open PRZR PORVs and block valves as necessary until PRZR pressure less than 2335 psig.
b. Check PORVs - BOTH CLOSED	b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.
	<u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally check breaker.
	 MOV-515, MCC D position 6C MOV-516, MCC C position 6C
6 Verify CNMT Ventilation Isolation	
 a. CVI annunciator - LIT Annunciator A-25, CNMT VENTILATION ISOLATION 	a. Momentarily deenergize CNMT particulate monitor, R-11, to actuate CVI.
b. Verify CVI valve status lights - BRIGHT	b. Manually close CVI valves as required
	<u>IF</u> valves can <u>NOT</u> be verified closed by MCB indication, <u>THEN</u> dispatch AO to locally close valves (Refer to ATT-3.0, ATTACHMENT CI/CVI for alternat

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FR-S.1 RESPONSE TO REACTO	REV: 17
FR-5.1 RESPONSE TO REACTO	PAGE 6 of 13
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7 Check If The Following Trips Have Occurred:	
a. Reactor trip	a. Dispatch AO to locally trip reactor:
	o Trip MG set breakers at bus 13 and bus 15.
	-OR-
	o Open reactor trip breakers locally.
b. Turbine trip	b. Dispatch AO to locally trip turbine using manual trip lever on west end of HP turbine.
* 8 Check If Reactor Is Subcritical:	
a. Energize MCC A <u>AND</u> B	
b. Check power range channels - LESS THAN 5%	b. Go to Step 9.
c. Check Intermediate range channels	c. Go to Step 9.
o Startup rate - NEGATIVE	
-OR-	
o Intermediate range channels - DECREASING	
d. Go to Step 18.	

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EOP:				
FR-S.1	RESPONSE TO RE	LACTOR REST	ART/ATWS	REV: 17
				PAGE 7 of 13
STEP A	CTION/EXPECTED RESPONSE	RESP	ONSE NOT OBTAINED	
		* * * * * *	* * * * * * * * *	* * * * * * *
	CA	UTION		
	/EL DECREASES TO LESS THAN WILL BE NECESSARY (REFER T			
	* * * * * * * * * * * * *	* * * * * *	* * * * * * * * *	* * * * * * *
* 9 Monito	or S/G Level:			
	row range level in at least S/G - GREATER THAN 7% [25%		rform the followin	g:
	erse CNMT]		Verify total feed greater than 400	
		-	<u>IF NOT, THEN</u> manupumps and align venticessary.	
			<u>IF</u> AFW can <u>NOT</u> be established. <u>THEN</u> SAFW (Refer to A ATTACHMENT SAFW)	
		2)	Maintain total fe greater than 400 narrow range leve than 7% [25% adve at least one S/G.	gpm until l greater
nari	crol feed flow to maintain row range level between 17% & adverse CNMT] and 50%	•		

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FR-S.1	RESPONSE TO READ	CTOR RESTART/ATWS	PAGE 8 of
STEP ACTIO	N/EXPECTED RESPONSE	RESPONSE NOT OBTAINE	.n.
			<u> </u>
10 Verify Di ISOLATED	lution Paths -		
a. Place RM	1W mode switch to BORATE		
b. Stop RMV	1 pumps	b. Perform the follow	ing:
		1) Close RMW to bl	ender (AOV-111)
		2) Direct AO to lo pump breaker	cally open RMW
		 RMW Pump A. M RMW Pump B. M 	
11 Stabilize	RCS Temperature:		
a. Control	steam dump as necessary		
b. Verify 1	the following:	b. <u>IF</u> RCS cooldown ca controlled, <u>THEN</u> c	
	exit T/Cs - STABLE OR EASING	MSIVe and go to St	
	sure in both S/Gs - LE OR INCREASING		
	cure in both S/Gs – TER THAN 110 PSIG		
c. Go to Si	tep 16		

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FR-S.1 RESPONSE TO REACTO	DR RESTART/ATWS	REV: 17
		PAGE 9 of 1:
STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED]
		_
12 Verify MFW Isolation:		
a. MFW pumps – TRIPPED	a. Manually close MFW j	oump
	discharge valves and pumps.	l trip MFW
b. Depress MANUAL pushbutton for A		
and B S/G MFW regulating valve and bypass valve controllers <u>AND</u>		
adjust to 0% demand.		
13 Identify Faulted S/G:	Go to Step 16.	
o Any S/G Pressure - DECREASING IN		
AN UNCONTROLLED MANNER		
- OR -		
o Any S/G Pressure – LESS THAN 110 PSIG		
		. •

•	FR-S.1 RESPO	NSE TO REACTOR	RESTART/ATWS	REV: 17	
;				PAGE 10 of 13	
\bigcup_{i}		PARONAR		1	
	STEP ACTION/EXPECTED R	ESPONSE	RESPONSE NOT OBTAINED]	
	* * * * * * * * * * * * *	<u>CAUTION</u>	* * * * * * * * * * *	* * * * * * *	
	o AT LEAST ONE S/G SHALL	BE MAINTAINED AV	AILABLE FOR RCS COOLDOWN	•	
	 IF BOTH S/GS ARE FAULTE TO EACH S/G. 	D, AT LEAST 50 G	PM FEED FLOW SHOULD BE M	AINTAINED	
	* * * * * * * * * * * * *	* * * * * * * *	* * * * * * * * * * *	* * * * * * *	
	14 Isolate Feed Flow To S/G:	o Faulted	Manually close valves.		
	o Close faulted S/G ME discharge valve	AFW pump	<u>IF</u> valves can <u>NOT</u> be cl dispatch AO to locally flowpaths as necessary.	isolate	
	 S/G A. MOV-4007 S/G B. MOV-4008 				
₹	o Pull stop faulted S/	G MDAFW pump			
)	o Close faulted S/G TE control valve	AFW flow			
	 S/G A. AOV-4297 S/G B. AOV-4298 				
	o Verify faulted S/G M regulating valve and valve - CLOSED				
	 S/G A, HCV-466 and S/G B, HCV-476 and 				
	o Verify MDAFW pump cr valves – BOTH CLOSEL			·	
	MOV-4000AMOV-4000B				
	o Close faulted S/G SA discharge valve	VEM bnmb			
i.	 S/G A. MOV-9701A S/G B. MOV-9701B 			. ·	
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	EOP: FR-S.1	TITLE:		CTOR	RESTART/ATWS	REV: 17
:	FR- 5.1				NEOTANI/AIWO	PAGE 11 of 13
\bigcirc	_	<u>.</u>				.
[STEP A	CTION/EXPECTED RE	SPONSE		RESPONSE NOT OBTAINED	}
	* * * * * *	* * * * * * * *	CAU1	<u></u> <u>FION</u>	* * * * * * * * * * * *	* * * * * * *
		FW PUMP IS THE ON The Tdafw Pump Mi			NRCE OF FEED FLOW, THEN FROM ONE S/G.	STEAM
	* * * * * *	* * * * * * * *	* * * * * *	* * *	* * * * * * * * * * *	* * * * *.* *
	15 Isolat Faulte	e Steam Flow F d S/G:	rom		Manually close valves.	
		fy faulted S/G A	RV - CLOSED		<u>IF</u> valves can <u>NOT</u> be cl dispatch AO to locally flowpaths as necessary.	isolate
		G A. AOV-3411 G B. AOV-3410				
	stea	e faulted S/G TDA m supply valve an STOP				
\smile		G A. MOV-3505A G B. MOV-3504A				
		fy faulted S/G bi le valves - CLOSI				
		G A, AOV-5738 and G B, AOV-5737 and				
	S/G	atch AO to complo isolation (Refer 10.0, ATTACHMENT	to	G)		
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	FR-S	. 1

TITLE:

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RESPONSE TO REACTOR RESTART/ATWS

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6 Check Core Exit T/Cs - LESS THAN 1200°F	<u>IF</u> core exit temperatures greater than 1200°F and increasing. <u>THEN</u> go to SACRG-1. SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.
OTE: Adverse CNMT conditions or loss of f failure of NIS detectors.	orced air cooling may result in
7 Verify Reactor Subcritical:	Perform the following:
o Power range channels – LESS THAN 5%	a. Stabilize RCS temperature.
 Intermediate range channels - STABLE OR DECREASING Intermediate range channels startup rate - NEGATIVE Core exit T/Cs - STABLE 	 b. Continue to inject boric acid. c. Perform actions of other FR procedures in effect which do <u>NOT</u> cooldown or otherwise add positive reactivity to the core. d. Direct RP to sample RCS and PRZR for boron concentration. e. Verify boron concentration greater than FIG-2.0, FIGURE SDM <u>IF</u> adequate shutdown margin verified. <u>THEN</u> go to Step 18. <u>IF NOT</u>, <u>THEN</u> perform the following: a. Allow RCS to heat up. b. Perform actions of other FR procedures in effect which do <u>NOT</u> cooldown or otherwise add positive reactivity to the core. c. Return to Step 4.

EOP:	TINE:	REV: 17
FR-S.1	FR-S.1 RESPONSE TO REACTOR RESTART/ATWS	
STEP	ACTION/EXPECTED RESPONSE RESPONSE NO	T OBTAINED
* * * *	CAUTION	* * * * * * * * * * * * * *
BORATIO ACTIONS	N SHOULD CONTINUE TO OBTAIN ADEQUATE SHUTDOWN MAN	RGIN DURING SUBSEQUENT
* * * *	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * *
[·] 18 Retu In E	rn to Procedure And Step Sffect	
	-END-	
	-	

EOP:

FR-S.1 APPENDIX LIST

<u>TITLE</u>

- 1) FIGURE SDM (FIG-2.0)
- 2) ATTACHMENT FAULTED S/G (ATT-10.0)
- 3) ATTACHMENT CI/CVI (ATT-3.0)
- 4) ATTACHMENT SAFW (ATT-5.1)
- 5) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 6) FOLDOUT

EOP:	TINE:				REV	<u> </u>	
FR-S.1		RESPONSE	TO REACTOR	RESTART/ATWS		E 1 o	f 1

FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-S series procedures.

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

- a. Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.