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Georgia Power

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RESIDUAL HEAT REMOVAL SYSTEM

1.0 PURPOSE

Unit 1

This procedure provides the necessary instructions for operation of the Residual Heat Removal System (RHRS). This procedure also provides instructions for filling the Reactor Coolant System (RCS) and/or the Refueling Cavity and for draining the Refueling Cavity using the RHRS. Instructions are included in the following steps:

- 4.1 Placing A Train Of RHR In Standby Readiness
- 4.2 Placing The RHRS 'In Service For RCS Cooldown
- 4.3 Establishing RHR Letdown
- 4.4 Shifting RHR Trains
- 4.5 Two Train RHR Operation During RCS Recirculation
- 4.6 Filling And Venting The RHRS
- 4.7 Filling The RCS (And The Refueling Cavity For Refueling)
- 4.8 Draining The Refueling Cavity
- 4.9 Operating RHR With One Train Of Cold Leg Discharge With Its Cold Leg Flowpath Isolated For Maintenance
- 2.0 PRECAUTIONS AND LIMITATIONS
- 2.1 PRECAUTIONS

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- 2.1.1 The vent overheating the Component Cooling Water (CCWS), cooling water flow to the RHR Heat Exchanger should not be throttled.
- 2.1.2 To avoid thermal shock of the RCS components, the flow through the RHRS should be initiated and reduced slowly.
- 2.1.3 The RCS pressure and temperature should not exceed 425 psig and 350°F when the RHRS is in service.

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2.1.4	Thoroughly f prior to ret This minimiz hammer due t	ill and vent urning them es system pe o gas entrai	all applic to service rformance c nment.	able RHR components after maintenance. legradation and water
2.1.5	Only one RHR changing sys RHRS operabi	train shoul tem configur lity.	d be altere ation. Thi	ed at a time when as helps maintain
2.1.6	Whenever the mid-nozzle) lower end of minimizes po entrainment	RCS is at 1 the RHRS flo a range fro tential loss from vortex	88 feet (or w should be m 3000 to 3 of RHR Pur formation.	ne foot above e limited to the 3500 gpm. This mp suction due to gas
2.1.7	Valves 1-HV- drilled on t are not capa from the opp	8716A and 1- he RHR Pump ble of a lea osite Train	HV-8716B ha side of the k tight sea RHR Pump.	ave a vent hole e disc. The valves al when pressurized
2.1.8	When cooling Recycle Evap the Unit 2 A on the NSCW	down the RC orator shoul CCW System. System.	S using one d be shut o This minin	e Train of RHR, the down or supplied from mizes the heat loads
2.2	LIMITATIONS			
2.2.1	With the RCS RHRS is requ Specificatio	Tavg greate fired to be o n 3.5.2.	r than or operable pe	equal to 350°F, the r Technical
2.2.2	With the RCS be operable 3.4.1.3.	in Hot Shut or in operat	down, the ion per Te	RHRS is required to chnical Specification
2.2.3	With the RCS to be operab	Tavg less tole per Techr	han 350°F, Mical Speci	the RHRS is required fication 3.5.3.
2.2.4	With RCS in operable or 3.4.1.4.1 ar	Cold Shutdow in operation nd 3.4.1.4.2.	m, the RHR per Techn	S is required to be ical Specification
2.2.5	During refue operable and 3.9.8.1 and	eling operation in operation 3.9.8.2.	lons, the R on per Tash	HRS is required to be nical Specification
2.2.6	If required Suction Reli Technical Sp	for Cold Ove lef Valves an pecification	erpressure re required 3.4.9.3.	Protection, two RHR operable per
2.2.7	When in Mode must remain closed for s	e 1, 2, or 3 open. Howev surveillance	1-HV-8809A ver, one va testing.	/B and 2-HV-8816A/B lve at a time may be

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2.2.8	The RHR Su (1-HV-8701 separately with RCS p automatica psig.	ctions From Hot Legs Lo A, 1-HV-8701B, 1-HV-870 interlocked to prevent ressure greater than 36 lly close before RCS pr	opš 1 and 4 2A, 1-HV-8702B) are from being opened 5 psig and to essure exceeds 750
2.2.9	The RHR Su opened unl	ctions From Hot Legs Lo ess the following valve	ops 1 and 4 cannot be s are closed.
	a. RHR P	MP-A DISCH TO CHG PMPS	SUCT 1-HV-3804A,
	b. RHR T	O SI PMP-B ISO VLV 1-HV	-8804B,
	c. RWST	TO RHR PMP SUCTION 1-HV	-8812A/B,
	d. CNMT	SUMP TO RHR PMP A(B) SU	CTION 1-HV-8811A/B.
2.2.10	RHR Pump M	otor start limitations:	
	a. Three	consecutive starts fro	om ambient temperature,
	b. Two S	tarts from operating te	mperature,
	c. Subse motor left	quent start permitted a is left running or 45 at standstill.	fter 15 minutes if the minutes if motor is
2.2.11	Fire event and 1-HV-8 service.	safe shutdown analysis 804B to be de-energized	requires 1-HV-8804A While RHR is in
3.0	PREREQUISI	TES OR INITIAL CONDITIO	DNS
3.1	Nuclear Se cooling wa	rvice Cooling Water (NS ter to the RHR Pump Mot	CW) is supplying for Coolers.
3.2	The CCWS i the RHR He Pumps may the system	s available and supplyi at Exchangers and Pump be operated without CCV temperature is less th	ing cooling water to Seal Coolers. The RHR V to the Seal Cooler if Man 150°F.

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4.0	INST	RUCTION	15	
4.1	PLACING A TRAIN OF RHR IN STANDBY READINESS			
			NOTE	
			This procedure is wri using Train A compone designations. Train designations are show parentheses.	tten nt B n in
4.1.1	If t main	he RHR tenance	Train is being place, FILL and VENT the	' in standby following rain per Step 4.6.
4.1.2	If t oper	he RHR: ating	S is being placed in RHR Train(s) to below	standby, COOL DOWN the 200°F as follows:
	a.	CLOSE	Letdown From RHR 1-H	V-0128,
	Ъ.	ADJUS and cl press	I Low Pressure Letdow harging flow as neces urizer level.	n Controller 1-PIC-0131 sary to maintain desire
		MAINT	AIN RCP seal injectio 2-HC-0182,	n between 8 to 13 gpm
	с,	CLOSE (022)	RHR To CVCS Letdown	Isolation 1-1205-U4-021
	d.	Slow1 A (B)	y CLOSE the RHR HEAT 1-HV-0606 (0607),	EXCH OUTLET for Train
	е.	Slow1 1-FV-	y CLOSE RHR HEAT EXCH 0618 (0619),	BYPASS for Train A (B)
			NOTE	
			Due to leak by of RHR Exchanger Outlet and Valves flowrate to RC be above auto open mi setpoint for 1-FV-061 (1-FV-0611).	Heat Bypass S may niflow O
	f.	If RH (1-FV (1-HS 1-FV-	R PMP-A (B) MINIFLOW -0611) does not auto -0611) to OPEN and RE 0610 (1-FV-0611) OPEN	ISO VLV 1-FV-0610 open, PLACE 1-HS-0610 ELEASE and ENSURE that NS,
	g.	MONIT Tempe	OR RHR Heat Exchanger rature 1-TR-0612 (061	Train A(B) Inlet
				3

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2.1.1.26			
		NOTE	
		Allow pump to run for approximately one hour less than or equal to for cooldown of piping	at 200°F
	h. When A(B).	RHR Train A(B) is belo	w 200°F, STOP RHR PUMP
4.1.3	RESTORE po suction as	wer to the RHR Train A follows:	(B) to CCP (SIP)
	a. CLOSE	1ABB-05 to valve 1-HV	-8804A,
	b. CLOSE	1BBB-05 to valve 1-HV	-8804B,
	c. REMOV 1ABB-	E tags and CLOSE the K 05 and 1BBB=05.	2 link for breaker
4.1.4	ALIGN the	RHR train for standby	per Checklist 2.
4.1.5	If RHR is PERFORM th required:	being placed in standb e following; independe	y for MODE 3 entry, nt verification
	a. SHUT "125V	DOWN Inverter 1CD115 (DC 1E Electrical Dist	1DD116) per 13405-1, ribution System",
	b. OPEN and T Wire	the K2 links for break AG per 00306-C, "Tempo Control",	er 1ABE-15 (1BBE-13) erary Jumper And Lifted
	c. OPEN 1(4)	and LOCK the power sup Inlet Isolations:	plies to the RHR Loop
	1ABE-	15 (18BE-13) for 1-HV-	8701A (8702B),
	d. At 10 disco	DII5N (1CD1I6N) OPEN, nnect for 1-HV-8701B (LOCK and TAG the (1-HV-8702A).
4.1.6	If depress either:	urization of the RHR S	system is required,
	a. OPEN	the following:	
	(1)	OPEN SIS CHECK VALVE 7	TEST CNMT ISO 1-HV-8964,
	(2)	OPEN SIS CHECK VALVE T	TEST CNMT ISO 1-HV-8871,
	(3)	OPEN SIS RHR PMP A(B) 1-HV-8990A(B),	CHECK VALVE TEST
	- OR -		
	b. HAVE 1-HV-	Chemistr OPEN RHR TRA 3520(21).	AIN A(B) SAMPLE VALVE
4.1.7	If require CLOSE all verificati	d, when RHR depressuri valves opened in Step on required.	ization is complete, 4.1.6; independent

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4.2	PLACING TH	E RHRS IN SERVICE	FOR RCS COOL	DOWN
4.2.1	RESTORE po HOT LEG LO independen	wer to both of the CJ 1(4) Inlet Isol t verification rec	RHR PMP-A (1 ations as fo uired:	B) SUCTION FROM 11ows;
	a. If sh servi Distr	ut down, PLACE Inv ce per 13405-1, "1 ibution System",	erter 1CD115 25V DC 1E Ele	(1DD116) in ectrical
	b. At 10 the d	D1I5N (1CD1I6N) RH isconnect for 1-HV	MOVE tag, UNI 7-8701B (1-HV	LOCK and CLOSE -8702A),
	c. UNLOC LOOP 1ABE-	K and CLOSE RHR PM 1(4), 1-HV-8701A (15 (1BBE-13),	(P A(B) SUCTION (B702B) Supply	ON FROM HOT LEG y Breakers
	d. REMOV 1ABE-	E tags and CLOSE (15 (1BBE-13).	the K2 link fo	or breaker
		NOTES		
	а.	Removing power from will also affect 1 1-HV-8920 and 1-HV operability from to Room. Information be installed on ha 1-HV-8812A/B, 1-HV 1-HV-8702B stating valves can only be the Remote Shutdow	m 1-HV-8804A -HV-8812A/B, /-8702B the Control 1 tags should andswitches /-8920 and g that the e operated from m Panel.	/B om
	b.	When in Mode 1, 2 that 1-HV-8809A/B simultaneously.	or 3 ensure are not shut	
4.2.2	ALIGN the	RHRS for shutdown	cooling as f	ollows:
	a. CLOSE CROSS	both of the RHR SOVER ISO 1-HV-871	FRAIN A(B) TO 5A and 1-HV-8	HOT LEG 716B,
	b. CLOSE A (B)	both of the RHR 1 1-HV-0606 and 1-1	HEAT EXCH OUT HV-0607,	LET for Train
	c. CLOSI A (B)	both of the RHR 1-FV-0618 and 1-	HEAT EXCH BYP FV-0619,	ASS for Train
	d. CLOSH 1-HV	both of the RWST 8812A and 1-HV-88	TO RHR PMP A	(B) SUCTION
	e. ENSU 1&2 indep	RE OPEN both of th (3&4) ISO VLVs 1-H bendent verificati	e RHR PMP A(B V-8809A and l on required,) TO COLD LEG -HV-8809B;

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	f.	OPEN FROM 1-HV-	both of the RHR PMP A(B) HOT LEG LOOP 1(4) Valves 8702B,	UPSTREAM SUCTION 1-HV-8701B and
	g.	OPFN FROM	both of the RHR PMP A(B) HOT LEG LOOP 1(4) 1-HV-87	DOWNSTREAM SUCTION 701A and 1-HV-8702A.
4.2.3	REMO 1sol	VE pow ation	er from the L'R to Charg: Valves as follows:	ing and SI Pump
	a.	OTEN 1888- Lifte	the K2 links for breakers 05 and TAG per 00306-C, ' d Wire Control",	s 1ABB-05 and 'Temporary Jumper And
	ь.	OPEN	breaker 1ABB-05 to valve	1-HV-8804A,
	с.	OPEN	breaker 1BBB-05 to valve	1-HV-880'B.
4.2.4	STAR	TUPO	ne train of RHR as follow	#S:
	a.	VERIF 1-FV-	Y OPEN the RHR PMP-A (B) 0610 (1-FV-0611),	MINIFLOW ISO
	ь.	START	RHR FUMP A(B),	
	с.	ESTAB	LISH RHR Letdown per Step	p 4.3.
4.2.5	WARM	UP th	e RHRS as follows:	
			NOTE	
			The recommended RHR to R temperature difference for the completion of RHR was is 25°F; however, the Uni Shift Supervisor (USS) m allow a greater temperatu difference at his discret	CS or rmup it ay ure tion.
	a.	ADJUS 1-PIC 1-HV- flow,	T the LOW PRESSURE LETDO -0131 and/or LETDOWN FROM 0128 as required to main	WN Controller M RHR Control Valve tain desired letdown
		MONTT	OD DUD Lost Exchanger Tr	ain A/R) Inlat

MONITOR RHR Heat Exchanger Train A(B) Inlet Temperature 1-TR-0612 (0613) and Wide Range RCS Hot Leg Temperatures 1-TI-0413A, 1-TI-0423A, 1-TI-0433A, and 1-TI-0443A.

 4.2.6 When RHR warmup is completed, INITIATE full flow to t RCS as follows: a. THROTTLE OPEN the RHR HEAT EXCH BYPASS for Train A (B) 1-FV-0618 (0619) to establish a minimum fl rate of 3000 gpm. b. VERIFY the RHR PMP-A(B) MINIFIOW ISO VLV 1-FV-0610 (0611) CLOSES. CAUTION The RHR Heat Exchanger Train A(B) Bypass Flow Controller To potentiometer should be set for a minimum flow of 3000 gpm prior to placing controller in AUTO. The potentiometer is setting is approximately equal to (Desired Flow/5000)². c. PLACE the RHR HEAT EXCH BYPASS for Train A (B) Flow Controller 1-FIC-0618A (0619A) in AUTO if desired. d. ADJUST the LOW PRESSURE LETDOWN Controller 1-FIC-0131 and/or LETDOWN FROM RHR Control Valve t-W-0128 as required to maintain desired letdow flow. e. Slowly THROTTLE OPEN RHR HEAT EXCH OUTLEY for Train A (B) 1-HV-0606 (0607) to establish desire RCS coolin. 4.2.7 If RCS cooling using both RHR trains is desired. PLAC the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2. b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611). c. START RHR PUMP A(B). 	and a second distance second second second second	nan dari mana ya dari di yani takinya yanta kana sana	nannan 18 an an anna ann an Anna an Anna an Anna A	
 a. THROTTLE OPEN the RHR HEAT EXCH SYPASS for Train A (B) 1-FV-0618 (0619) to establish a miniuum fl rate of 3000 gpm. b. VERIFY the RHR PMP-A(B) MINIFIOW ISO VLV 1-FV-0610 (0611) CLOSES. CAUTION The RHR Heat Exchanger Train A(B) Bypass Flow Controller Potentiometer should be set for a minimum flow of 3000 gpm prior to placing controller in AUTO. The potentiometer setting is approximately equal to (Desired Flow/SOO)⁻. c. PLACE the RHR HEAT EXCH SYPASS for Train A (B) Flow Controller 1'-FIC-0618A (0619A) in AUTO if desired. d. ADJUST the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve 1-W-0128 as required to maintain desired letdow flow. e. Slowly THROTTLE OPEN RHR HEAT EXCH OUTLEF for Train 2 S) 1-HV-0606 (0607) to establish desired RCS c.olf: 4.2.7 If RCS cooling using both RHR trains is desired. FLAC the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2. b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611). c. START RHR PUMP A(B). 	4.2.6	When RHR RCS as fo	warmup is completed, I llows:	NITIATE full flow to the
 b. VERIFY the RHR PMP-A(B) MINIFLOW ISO VLV 1-FV-0610 (0611) CLOSES, CAUTION The RHR Heat Exchanger Train A(B) Bypass Flow Controller Potentiometer should be set for a minimum flow of 3000 gpm prior to placing controller in AUTO. The potentiometer setting is approximately equal to (Desired Flow/5000)². c. PLACE the RHR HEAT EXCH BYPASS for Train A (B) Flow Controller 1-FIC-0618A (0619A) in AUTO 1f desired. d. ADJUST the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETLOWN FROM RHR Control Valve 1-HV-0128 as required to maintain desired letdow flow. e. Slowly THROTTLE OPEN RHR HEAT EXCH OUTLE? for Train (S) 1-HV-0606 (0607) to establish desire RCS c.old: 4.2.7 If RCS cooling using both RHR trains is desired. FLAC the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2, b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611), c. START RHR PUMP A(B). 		a. THRO A (B rate	TTLE OPEN the RHR HEAT) 1-FV-0618 (0619) 70 of 3000 gpm,	EXCH BYPASS for Train establish a minimum flo
 CAUTION The RHR Heat Exchanger Train A(B) Eypass Flow Controller Potentiometer should be set for a minimum flow of 3000 gpm prior to placing controller in AUTO. The potentiometer setting is approximately equal to (Desired Flow/S000)". PLACE the RHR HEAT EXCH BYPASS for Train A (B) Flow Controller T-FIC-0618A (0619A) in AUTO if desired. ADJUST the LOW PRESSURE LETDOWN Controller 1-FIC-0131 and/or LETDOWN FROM RHR Control Valve (-NY-0128 as required to maintain desired letdow flow. Slowly THROTTLE OPEN RHR HEAT EXCH OUTLEF for Train (B) 1-HV-0606 (0607) to establish desire RCS c.olt. 4.2.7 If RCS cooling using both RHR trains is desired. PLAC the second train in service as follows: VERIFY the applicable RHR Train aligned per Step (4.2.2, b) VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV (1-fY-0610 (1-FY-0611), c) START RHR PUMP A(B). 		b. VERI 1-FV	FY the RHR PMP-A(B) MI -0610 (0611) CLOSES,	NIFLOW ISO VLV
 The RHR Heat Exchanger Train A(B) Bypass Flow Controller Potentiometer should be get for a minimum flow of 3000 gpm prior to placing controller in AUTO. The potentiometer setting is approximately equal to (Desired Flow/5000)⁻. C. PLACE the RHR HEAT EXCH BYPASS for Train A (B) Flow Controller 1-FIC-0618A (0619A) in AUTO if desired. d. ADJUST the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve 1-HV-0128 as required to maintain desired letdow flow, e. Slowly THROTTLE OPEN RHR HEAT EXCH OUTLET for Train (S) 1-HV-0606 (0607) to establish desire RCS c.olta: 4.2.7 If RCS cooling using both RHR trains is desired. PLAC the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2, b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611), c. START RHR PUMP A(B). 			CAUTION	
 c. PLACE the RHR HEAT EXCH BYPASS for Train A (B) Flow Controller 1-FIC-0618A (0619A) in AUTO if desired, d. ADJUST the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve (-HV-0128 as required to maintain desired letdow flow, e. <u>Slowly</u> THROTTLE OPEN RHR HEAT EXCH OUTLET for Train (The RHR Heat Exchange A(B) Bypass Flow Cont Potentiometer should a minimum flow of 300 prior to placing cont AUTO. The potentiom setting is approximat to (Desired Flow/500)	er Train troller be set for D0 gpm troller in eter tely equal D) .
 d. ADJUST the LOW PRESSURE LETDOWN Controller 1-PIC-0131 and/or LETDOWN FROM RHR Control Valve 1-HV-0128 as required to maintain desired letdow flow, e. <u>Slowly</u> THROTTLE OPEN RHR HEAT EXCH OUTLET for Train (c. PLAC Flow desi	E the RHR HEAT EXCH B Controller 1-FIC-061 red,	YPASS for Train A (B) BA (0619A) in AUTO if
 e. <u>Slowly</u> THROTTLE OPEN RHR HEAT EXCH OUTLEY for Train (3) 1-HV-0606 (0607) to establish desire RCS cooling 4.2.7 If RCS cooling using both RHR trains is desired, PLAG the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2, b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611), c. START RHR PUMP A(B). 		d. ADJU 1-PI - HV flow	UST the LOW PRESSURE L C-0131 and/or LETLOWN V-0128 as required to v	ETDOWN Controller FROM RHR Control Valve maintain desired letdown
 4.2.7 If RCS cooling using both RHR trains is desired, PLAG the second train in service as follows: a. VERIFY the applicable RHR Train aligned per Step 4.2.2, b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611), c. START RHR PUMP A(B). 		e. Slov Trai RCS	vly THROTTLE OPEN RHR In (5) 1-HV-0606 (06 c.olf.	HEAT EXCH OUTLEY for 07) to establish desired
 a. VERIFY the applicable RHR Train aligned per Ster 4.2.2, b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-TV-0610 (1-FV-0611), c. START RHR PUMP A(B). 	4,2,7	If RCS control the second	ooling using both RHR nd train in service as	trains is desired, PLACI follows:
 b. VERIFY OPEN the RHR PMP-A (B) MINIFLOW ISO VLV 1-FV-0610 (1-FV-0611), c. START RHR PUMP A(B). 		a. VER: 4.2	IFY the applicable RHR .2,	Train aligned per Step
C. START RHR PUMP A(B).		b. VER 1-7	IFY OPEN the RHR PMP-A V-0610 (1-FV-0611),	(B) MINIFLOW ISO VLV
		c. STA	RT RHR PUMP A(B).	
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		NOTE	2.4.586
		The recommended RHR to RG temperature difference for the completion of RHR was is 25°F; however, the USS allow a greater temperatu difference at his discret	CS or rmup S may ure tion.
4.2.8	When RHR RCS as f	warmup is completed, INIT	IATE full flow to the
	a. THR A (rat	OTTLE OPEN the RHR HEAT EX B) 1-FV-0618 (0619) to est e of 3000 gpm,	CH BYPASS for Train ablish a minimum flow
	b. VER (06	IFY the RHR PMP-A (B) MINI 11) CLOSES,	FLOW ISO 1-FV-0610
		CAUTION	
		The RHE Heat Exchanger T A(B) Bypass Flow Control Potentiometer should be a minimum flow of 3000 g prior to placing control AUTO. The potentiometer setting is approximately to (Desired Flow/5000) ² .	rain ler set for pm ler in equal
	c. PLA Flo des	CE the RHR Train A(B) Heat w Controller 1-FIC-0618A (pired,	Exchanger Bypass 0619A) in AUTO if
	d. ADJ 1-P 1-% flc	UST the LOW PRESSURE LETDO PIC-0131 and/or LETDOWN FRO IV-0128 as required to main ow,	WN Controller M RHR Control Valve tain desired letdown
	e. Slo Tra RCS	wly THROTTLE OPEN RHR HEAT In A (B) 1-HV-0606 (0607) cooling.	EXCH OUTLET for to establish desired
4.2.9	ESTABLIS Cold Shu	SH RCS Cooldown per 12006-C	, "Unit Cooldown To

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4.3	ESTABLISHI	NG RHR LETDOWN	•
4.3.1	CLOSE the I	LETDOWN FROM RHR Control	1 Valve 1-HV-0128.
		NOTE	
		Only one train of RHR shoe aligned for letdown operation to prevent pressurizing the suction an idle RHR Pump from th operating RHR train.	nould n of ne
4.3.2	OPEN the RJ RHR train verificatio	HR to CVCS Letdown Isola that will be used for le on required:	ation of the operatin etdown; independent
	a. 1-120 letdor	5-U4-021 if Train A <u>wil</u>	L be used for RHR
	b. 1-120 letdov	5-U4-022 if Train B will wn.	<u>l</u> be used for RHR
4.3.3	If CVCS let LETDOWN Con	tdown is <u>not</u> in service ntrol Valve 1-PV-0131.	, CLOSE LOW PRESSURE
		NOTES	
	a.	Design maximum letdown : 120 gpm.	flow is
	Ъ.	The Low Pressure Letdown Valve lifts at 600 psig	n Relief
4.3.4	Slowly OPE	N the LETDOWN FROM RHR	1-HV-0128.
4.3.5	ADJUST the and the LE required t	LOW PRESSURE LETDOWN C TDOWN FROM RHR Control o obtain the desired Le	ontroller 1-PIC-0131 Valve 1-HV-0128 as tdown Flow 1-FI-01320

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4.4	SHIFTING R	HR TRAINS	
4.4.1	VERIFY the	lineup on the idle RH	R Train as follows:
	a. CLOSE (8812	the RWST TO RHR PMP A B),	(B) SUCTION 1-HV-8812A
	b. OPEN SUCTI 1-HV-	the RHR PMP-A (B) DOWN ON FROM HOT LEG 1-HV-8 8701B (8702B),	STREAM AND UPSTREAM 701A (8702A) and
	c. ENSUR 1-FV-	E the RHR HEAT EXCH BY 0618 (0619) is in MAN	PASS for Train A (B) and CLOSED,
d. CLOSE the RHR TRAIN A(B) TO HOT 1-HV-8716A (8716B),			HOT LEG CROSSOVER ISO
	€. CLOSE 1-HV-	the RHR HEAT EXCH OUT 0606 (0607),	LET for Train A (B)
	f. ENSUR 1-FV-	E OPEN the RHR PMP-A (0610 (0611),	B) MINIFLOW ISO VLV
		CAUTION	
		Starting an RHR Pump a water level below 216 elevation and with 1-HV-8809A (B) closed cause water hammer in discharge piping.	t RCS foot will the
	g. ENSUR (3 &	E OPEN RHR PUMP A (B) 4) ISO VLV 1-HV-8809A	TO COLD LEG 1 & 2 (8809B).
4.4.2	START the	RHR PUMP A(B).	

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4.4.3	SHIFT RHR 1 minimum flo	etdown to to w as follow	the train wi ws:	nich is operating on
	a. MONITO letdow Contro Contro desire	R Letdown m and ADJU ller 1-PIC l Valve 1- d letdown	Flow 1-FI-01 ST the LOW 1 -0131 and/or HV-0128 as 1 flow,	132C while shifting PRESSURE LETDOWN r LETDOWN FROM RHR required to maintain
	b. OPEN t train indepe	the RHK To which is opendent veri	CVCS Letdown perating on fication rea	n Isolation of the RHR minimum flow; quired:
	(1) 1	-1205-U4-0	21 if Train w,	A is operating on
	(2)	-1205-U4-0 minimum flo	22 if Train w.	B is operating on
	c. CLOSE opposi	the RHR To te train;	CVCS Letder independent	wn Isolation of the verification required.
4.4.4	SHIFT flow follows:	to the RHR	'train that	was just started as
	a. ENSURI (3&4)	OPEN the ISO VLV, 1	RHR PUMP A(-HV-8809A (B) TO COLD LEG 1&2 8809B),
	b. MONITO und 1- J000 a step,	DR RHR Trai -FI-0619A a and 3500 gp	n A and Tra nd MAINTAIN m throughou	in B Flow 1-FI-0618A total RHR flow between t the remainder of this
	c. ENSUR 1-FV- servi	E the RHR H 0618 (0619) ce is in MA	EAT EXCH BY cf the tra N,	PASS for Train A (B) in being removed from
	d. MONIT flow Contr Contr desir	OR Letdown and ADJUST oller 1-PIC ol Valve 1- ed letdown	Flow 1-FI-0 the LOW PRE -0131 and/o HV-0128 as flow,	132C while shifting RHR SSURE LETDOWN r LETDOWN FROM'RHR required to maintain
	e. <u>Slowl</u> I-HV- remov Excha servi betwe	y THROTTLE 0606 (0607) ed from ser nger Bypass ce OPEN whi en 3000 and	the RHR HEA and Bypass vice CLOSED of the tra le maintain 3500 gpm,	T EXCH A(B) OUTLET of the train being and the RHR Heat in being placed in ing total RHR flow
	f. If RH (1-FV 1-HS- ENSUR	R PMP-A(B) -0611) does 0610 (1-HS- E that 1-FV	MINIFLOW 1S not auto o 0611) to OF 7-0610 (1-FV	O VLV 1-FV-0610 pen, if required, PLACE EN and RELEASE and '-0611) opens,

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	5. When the Heat Exchanger Outlet and Bypass of the RHR train being removed from service are both fully closed, MONITOR RHR Heat Exchanger Inlet Temperature 1-TR-0612 (0613),					
	1:. When the RHR train has cooled to below 200°F, ST the RHR Pump,					
	i. ADJUS l-FIC appro desin	ST Heat Exchang C-0618A (0619A) Oximately 3000 red.	er Bypass Fl as required gpm, then Pl	ow Controller 1 to obtain ACE it in AUTO if		
4.4.5	Slowly THE A (B) 1-HV cooling.	Slowly THROTTLE OFEN the RHR HEAT EXCH OUTLET for Train \overline{A} (B) 1-HV-0606 (0607) to establish desired RCS cooling.				
4.4.6	ENSURE the 1-FV-0618 3000 gpm.	ENSURE the RHR HEAT EXCH BYPASS for Train A (B) 1-FV-0618 (0619) maintains a minimum total RHR flow of 3000 gpm.				
4.4.7	If required, PLACE the idle train in standby per Step 4.1.					
4.5	TWC TRAIN	TWC TRAIN RHR OPERATION DURING RCS RECIRCULATION				
4.5.1	VERIFY the lineup on the idle RHR Train as follows:					
	a. CLOS 1-HV	E the RWST TO R -8812A (8812B),	HR PUMP A(B)	SUCTION		
	b. OPEN SUCT 1-HV	the RHR PMP A(ION FROM HOT LE -8701B (8702B),	B) DOWNSTREA G 1-HV-8701A	AM AND UPSTREAM A (8702A) and		
	c. CLOS 1-HV	E the RHR TRAIN -8716A (8716B),	A(B) TO HO	I LEG CROSSOVER ISO		
	d. ENSU 1-FV	RE the RHR HEAT -0618 (0619) is	EXCH BYPAS	S for Train A (B) CLOSED,		
	e. CLOS 1-kV	E the RHR HEAT -0606 (0607),	EXCH OUTLET	for Train A (B)		
	f. ENSU 1-FV	RE OPEN the RHR -0610 (0611),	PMP-A (B)	MINIFLOW ISO VLV		

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		CAUTION	
	S w e 1 c d	tarting an RHR Pump at RC ater level below 216 foot levation and with -HV-8809A (B) closed will ause water hammer in the lischarge piping.	S
	g. ENSURE (3 & 4	OPEN RHR PUMP A (B) TO C) ISO VLV 1-HV-8809A (880	OLD LEG 1 & 2 9B).
4.5.2	START the R	HR PUMP A(B),	
4.5.3	If desired, follows:	SHIFT RHR letdown to the	alternate train as
	a. MONITO letdow Contro Contro desire	OR Letdown Flow 1-FI-0132C m and ADJUST the LOW FRES oller 1-PIC-0131 and/or LE ol Valve 1-HV-0128 as requ ed letdown flow,	while shifting SURE LETDOWN TDOWN FROM RHR ired to maintain .
	b. OPEN t train verifi	the RHR To CVCS Letdown Is which is to be used for 1 cation required:	olation of the RHR etdown; independent
	(1) 1 n	1205-U4-021 if Train A i minimum flow,	s operating on
	(2) 1 n	-1205-U4-022 if Train B i minimum flow.	s operating on
	c. CLOSE opposi	the RHR To CVCS Letdown I Ite train; independent ver	solation of the ification required.
4.5.4	THROTTLE OF 1-FV-0618 (is establis	PEN RHR HEAT EXCH BYPASS f (0619) until a minimum flo shed.	or Train A (B) wrate of 3000 gpm
4.5.5	VERIFY RHR closes.	PMP A (B) MINIFLOW ISO VL	V 1-FV-0610 (0611)
		CAUTION	
		The RHR Heat Exchanger Tra A(B) Bypass Flow Controlle Potentiometer should be se for a flow of 3000 gpm pri to placing controller in A Potentiometer setting is approximately equal_to (desired flow/5000) ² .	in er et .or AUTO.
4.5.6	PLACE RHR I Controller	HEAT EXCH BYPASS for Train 1-FIC-0618A (0619A) in AU	h A (B) Flow JTO if desired,

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4.5.7	Slowly THRO (B) 1-HV-06	TTLE OPEN RHR HEAT E 06 (0607) to establi	XCH OUTLET for Train A sh desired RCS cooling.		
4.5.8	When two tr DOWN one tr	ain RHR operation is ain of RHR as follow	no longer desired, SHUT s:		
	a. If the provid altern	train being removed ing RHR letdown, SHI ate train per 4.5.3,	from service is FT RHR letdown to the		
	b. Slowly I-HV-0 Train remove	THROTTLE CLOSED the 606 (0607) and RHR H A (B) 1-FV-0618 (061 d from service,	RHR HEAT EXCH OUTLET EAT EXCH BYPASS for 9) of the train being		
	c. STOP RHR PUMP A(B),				
	d. If req Step 4	uired, PLACE the idl	e train in standby per		
4.6	FILLING AND	VENTING THE RHRS			
		CAUTION			
	A b c	ll vented effluent s e handled as potenti ontaminated fluid.	hould ally		
		NOTE			
	T b s V t o	he 1-HV-8812A(B) val e opened using motor imultaneously with t ents open, as detail o achieve a successf f the RHR Hx.	ve should operator he System ed below ul vent		
4.6.1	INSTALL Tyg	on hoses at the foll	owing vent points:		
	a. RHR To Suctio	CCP (SI Pump) n Header Vent,	1-1205-X4-141(124),		
	b. RHR Tr Inject	ain A(B) Cold Leg ion Vent,	1-1205-X4-013(030),		
	c. RHR Ho Crosso	t Leg Injection ver Vent,	1-1205-X4-120,		
	d. RHR Pu Connec	mp Suction Flush tion Vent,	1-1205-X4-196(400),		
	e. RHR Pu	mp Seal Water Vent,	1-1205-U4-235(236).		
4.6.2	ROUTE the I contaminate	ygon hoses to contai	in the potentially		

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4.6.3	If power ha Isolations, verificatio	s been remove PERFORM the n required:	d from the following;	RHR Loop Inlet independent	
	a. If shu servic Distri	t down, PLACE e per 13405-1 bution System	Inverter 1 , "125V DC	CD115 (1DD116) in 1E Electrical	
	b. At 1CD the di	115N (1CD116N sconnect for) REMOVE ta 1-HV-8701B	ag, UNLOCK and CLOSE (1-HV-8702A),	
	c. UNLOCK 1-HV-8 (1BBE-	and CLOSE RH 701A (8702B) 13-1) and 1AB	R Loop 1(4) Supply Brea E-15-2 (1B)) Inlet Isolation akers 1ABE-15-1 3E-13-2),	
	d. REMOVE for br 1BBE-1	tags and CLO eaker lABE-15 3-2.	SE the link -1, lABE-19	ks for the K2 Relay 5-2, 1BBE-13-1 and	
4.6.4	ALIGN the RHR train remote-operated components for filling and venting per Checklist 1.				
4.6.5	If required, ALIGN the RHR train for filling and venting per 11011-1, "Residual Heat Removal System Alignment".				
4.6.6	CLOSE the R the opposit	Hk TRAIN A(B) e train:	TO HOT LEO	G CROSSOVER ISOs of	
	a. 1-HV-8	716A if train	A is the d	opposite train,	
	b. 1-HV-8	716B if train	B is the	opposite train.	
4.6.7	OPEN the RHR TRAIN A(B) TO HOT LEG CROSSOVER ISO 1-HV-8716A (8716B).				
4.6.8	OPEN the RHR HEAT EXCH OUTLET 1-HV-0606 for Train A (B) (0607).				
4.6.9	CLOSE the F 1-FV-0618 (RHR HEAT EXCH 0619).	BYPASS for	Train A (B)	



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		CAUTIONS	

when venting is complete, venting RHR Train A will result in overflowing contaminated water from the Vent Valve Room down into the Auxiliary Building vestibule R-Cl31 (Level C).

b. If vent 1-HV-10466 is not closed when venting is complete, venting RHR Train B will result in contaminated water on the floor of the room containing the Train B vent, and actuation of the room sump level switch light on Panel QPCP.

NOTE

RHR Suction Vent Valves 1-HV-10465 (10466) are in sealed rooms and therefore cannot be visually observed as vented. Personnel at these locations should stand outside the knockout wall and verify adequate venting by listening for a change in the sound indicating that the air is vented.

- 4.6.10 Prior to opening RHR Suction Vent Valves 1-HV-10465 (10466), NOTIFY Health Physics Department to monitor Room R-C131 (R-B08) in Auxiliary Building to contain spillage and minimize room contamination.
- 4.6.11 STATION personnel at the following valve locations and OPEN the valves:

a.	RHR TO CCP (SI PUMP) Suction Header Vent,	1-1205-X4-141(124),
b.	RHR TRAIN A(B) Cold Leg Injection Vent,	1-1205-X4-013(030),
с.	RHR Hot Leg Injection Crossover Vent.	1-1205-X4-120,

d. RHR SUCT VENT LINE 1-HV-10465(10466). TRN-A (B),

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4.6.12	VERIFY CLOSED t HOT LEG 1(4) 1-	the RHR PMP A(B) UP -HV-8701B (8702B).	STREAM SUCTION FROM		
4.6.13	OPEN the RHR PM LOOP 1(4) 1-HV-	MP A(B) DOWNSTREAM -8701A (8702A).	SUCTION FROM HOT LEG		
4.6.14	CLOSE and HOLD Miniflow Isolat handswitch app: Step 4.6.15.	CLOSED handswitch tion Valve 1-FV-061 roximately 10 secon	for RHR Pump 1(2) 0 (0611). RELEASE the ds after performing		
4.6.15	COMMENCE RHR F: SUCTION 1-HV-88	ill by opening RWST 812A (8812B).	TO RHR PMP A(B)		
4.6.16	When a solid stream of water issues from the Vent Valves listed in Step 4.6.11, CLOSE the associated Vent Valve.				
4.6.17	REOPEN all of the Vent Valves that are listed in Step 4.6.1.				
4.6.18	When a solid stream of water issues from the vent, CLOSE the associated Vent Valve.				
4.6.19	CLOSE 1-HV-870	1A (8702A).			
4.6.20	When all vention are in the con- verification re	ng is completed, EN dition listed below equired:	ISURE the vent points ; independent		
	a. RHR To CC 1-1205-X4	P (SIP) Suction Hea -141 (124) CLOSED a	ader Vent and vent line capped,		
	b. RHR Train 1-1205-X4	A(B) Cold Leg Inje -013 (030) CLOSED a	ection Vent and vent line capped,		
	c. RHR Hot L CLOSED wi	eg Injection Crosso th vent line capped	over Vent 1-1205-X4-120 1,		
	d. RHR Pump	Suction Vent 1-HV-1	L0465 (10466) CLOSED,		
	e. RHR Pump 1-1205-X4	Suction Flush Conne -196 (400) CLOSED a	ection Vent and vent line capped,		
	f. RHR Pump CLOSED wi	Seal Water Vent 1-1 th vent line capped	1205-U4-235 (236) 1,		

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		NOTE				
		The following Step is to performed if in the judg of the USS the line may airbound.	be ment be			
4.6.21	VENT the C Containmen	ontainment A Suction Lin t Sump as follows:	e back to the			
4.6.21.1	HAVE the E Terminal C SUMP TO RH PMP-A SUCT Jumper And	lectrical Department con 6 to C7, 1ABD29W in MCC1 R PMP-A 1-HV-8811A to op ION 1-HV-8812A open, per Lifted Wire Control".	nect a jumper from ABD to enable CNMT en with RWST TO RHR 00306-C, "Temporary			
4.6.21.2	OPEN CNMT	SUMP TO RHR PMP-A 1-HV-8	811A.			
4.6.21.3	OPEN RHR B Dypass Che	OPEN RHR BYPASS FROM CNMT EMERG SUMPS 1-1205-U4-120 to Sypass Check Valve 1-1205-U4-122.				
4.6.21.4	OBSERVE the Containment Sump for water entering from the Containment Suction Line.					
4.6.21.5	When water is observed entering the Containment Sump, CLOSE 1-HV-8811A.					
4.6.21.6	CLOSE 1-12	CLOSE 1-1205-U4-120.				
4.6.21.7	HAVE the E in Step 4. Lifted Wir	lectrical Department rem 6.21.1 per 00306-C, "Tem e Control".	nove the jumper place mporary Jumper And			
		NOTE				
		The following Step is to performed if in the judg of the USS the line may airbound.	be gment be			
4.6.22	VENT the C Containmen	ontainment B Suction Lin t Sump as follows:	ne back to the			
4.6.22.1	HAVE the E Terminal C SUMP TO RH PMP-B SUCT Jumper And	lectrical Department cor 6 to C7, 1BBD29W in MCC1 IR PMP-B 1-HV-6811B to op TON 1-HV-8812B open, per Lifted Wire Control".	nnect a jumper from LBBD to enable CNMT pen with RWST TO RHR c 00306-C, "Temporary			
4.6.22.2	OPEN CNMT	SUMP TO RHR PMP-B 1-HV-8	B811B.			

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			Contraction Contraction of Contracti		
4.6.22.3	OPEN RHR BY Bypass Chec	PASS FROM CNM k Valve 1-120	T EMERG SUMP 5-U4-123.	S 1-1205-U4-121 to	
4.6.22.4	OBSERVE the Containment Sump for water entering from the Containment Suction Line.				
4.6.22.5	When water CLOSE 1-HV-	is observed e 8811B.	ntering the	Containment Sump,	
4.6.22.6	CLOSE 1-120	5-U4-121.			
4.6.22.7	HAVE the El in Step 4.6 Lifted Wire	ectrical Depa .22.1 per 003 Control".	rtment remov 06-C, "Tempo	e the jumper laced rary Jumper And	
4.6.23	PLACE the R plant condi	HR train in a tions as foll	configurati ows:	on appropriate to	
	a. If RCS 350°F,	temperature PERFORM the	is greater t following:	han or equal to	
	(1) E C o	NSURE OPEN tb ROSSOVER ISO pposite train	e RHR TRAIN 1-HV-8716A (A (B) TO HOT LEG 8716B) of the	
	(2) P P	ERFORM Step 4 lace the trai	.1 starting n in standby	at Step 4.1.3 to	
	b. If RCS RHR tr	temperature ain for RCS c	is less than irculation a	350°F, ALIGN the s follows:	
	(1) C 1	LOSE the RWST -HV-8812A (88	TO RHR PMP	A(B) SUCTION	
	(2) O H	PEN the RHR P OT LEG 1(4) 1	MP A(B) DOWN -HV-8701A (8	STREAM SUCTION FROM 702A),	
	(3) O H	PEN the RHR P OT LEG 1(4) 1	MP A(B) UPST -HV-8701B (8	REAM SUCTION FROM 702B),	
	(4) C I	LOSE the RHR SO 1-HV-8716A	TRAIN A(B) T (8716B),	O HOT LEG CROSSOVER	
	(5) O I	PEN the RHR F SO VLV 1-HV-8	UMP A(B) TO 8809A (8809B)	COLD LEG 1&2 (3&4); independent	

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4.7	FILLING T REFUELING	HE RCS (AND THE REFUEL)	ING CAVITY FOR
		CAUTIONS	
	a.	Maintain seal injection whenever RCS level is above the level of the Seals (elevation 190 of This prevents crud int into the seal chambers	on flow at or e a RCP feet). filtration s.
	b.	Airborne activity show monitored when filling Refueling Cavity from until the level is abo Reactor Vessel Flange	uld be g the RHR ove the
		NOTES	
	a.	With the water level : Refueling Cavity less 217 feet 0 inches elev (23 feet above the ver flange), both trains of RHRS are required to 1 operable with one trais operation.	in the than vation ssel of the be in in
	b.	Performance of this s use of the RHR train operable but not oper	tep assumes that is ating.
	с.	To minimize airborne it is preferred to fi Refueling Cavity by g to the Reactor Vessel prior to starting an	activity, 11 the ravity Flange RHR Pump.
4.7.1	ESTABLISH	H RCS or Refueling Cavi .e.	ty level monitoring as
4.7.2	CLOSE the 1-HV-8809	RHR PUMP A(B) TO COLD A (8809B).	LEG 1&2 (3&4) ISO VLV
4.7.3	ENSURE th 1-FV-0618	ne RHR HEAT EXCH BYPASS 8 (0619) is in MANUAL a	for Train A (B) nd CLOSED.
4.7.4	CLOSE the	RHR HEAT EXCH OUTLET	for Train A (B)

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4.7.5	CLOSE the F 1-HV-8701A	(8702A) and 1-HV-8701	ROM [®] HOT LEG 1(4) B (8702B).
4.7.6	OPEN the RV (8812B).	VST TO RHR PMP A(B) SU	CTION 1-HV-8812A
4.7.7	VERIFY OPEN (0611).	N the RHR PMP A(B) MIN	IFLOW ISO VLV 1-FV-0610
4.7.8	OPEN the RH 1-HV-8809A	HR PUMP A(B) TO COLD L (8809B) to start grav	EG ISO VLV ity fill from the RWST.
4.7.9	If desired	, START RHR PUMP A(B).	
		NOTE	
		Fill the Refueling Cav slowly to the 200 foot elevation to prevent airborne activity and maintain water clarity	ity to
4.7.10	Slowly THRO A (B) 1-HV	OTTLE OPEN the RHR HEA -0606 (0607) to obtain	T EXCH OUTLET for Train the desired flow rate.
4.7.11	At the des: 1-HV-0606	ired level, CLOSE the (0607).	RHR HEAT EXCH OUTLET
4.7.12	CLOSE the 1 1-HV-8809A	RHK PUMP A(B) TO COLD (8809B).	LEG 1&2 (3&4) ISO VLV
4.7.13	If running	, STOP RHR PUMP A(B).	
4.7.14	CLOSE the 1 (8812B).	RWST TO RHR PMP A(B) S	UCTION 1-HV-8812A
4.7.15	OPEN the R (8702A) an	HR PMP A(B) SUCTION FR d 1-HV-8701B (8702B),	OM HOT LEGS 1-HV-8701A
4.7.16	OPEN the R 1-HV-8809A	HR PUMP A(B) TO COLD L (8809B); independent	EG Isolation verification required.

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4.8	DRAINING T	HE REFUELING CAVITY	
		CAUTION	
		Excessive flowrate du pumpdown with Upper In Assembly installed conto to void formation in suction. Trend RHR P parameters on ERF for detection of possible Pump degradation due vortexing.	ring nternals uld lead RHR Pump ump early RHR to
		NOTES	
	а.	With the water level Refueling Cavity less 217 feet 0 inches ele (23 feet above the ve flange), both trains RHRS are required to operable with one tra operating.	in the than vation ssel of the be in
	Ъ.	Performance of this s use of the RHR train operable but not oper	tep assumes that is ating.
4.8.1	ENSURE OPE VLV 1-HV-8	N the RHR Pump A(B) T 809A (8809B).	O COLD LEG 1&2 (3&4)
4.8.2	CLOSE the the operat	RHR TRAIN A(B) TO HOT	LEG CROSSOVER ISO of
	a. 1-HV-	8716A if Train A is o	perating,
	b. 1-HV-	8716B if Train B is o	perating.
4.8.3	ENSURE CLC	SED the RHR TO HL ISO	VLV 1-HV-8840.
4.8.4	ENSURE the 1-FV-0618	RHR HEAT EXCH BYPASS (0619) is in MANUAL a	for Train A (B) nd CLOSED.
4.8.5	CLOSE the 1-HV-0606	RHR HEAT EXCH OUTLET (0607).	for Train A (B)
4.8.6	UNLOCK and 1-1205-U6- verificati	d OPEN RHR Test Recirc -027 and 1-1205-U4-226 Lon required.	ulation To RWST ; independent
4.8.7	CLOSE the (8812B).	RWST TO RHR PMP A(B)	SUCTION 1-HV-8812A

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4.8.8	OPEN the F FROM HOT I 1-HV-8701E	AHR PMP A EG Isola (8702B)	(B) DOWNSTREAM ations 1-HV-870	AND UPSTREAM SUCTION 1A (8702A) and
4.8.9	VERIFY OPE (0611).	IN the RI	R PMP A(B) MIN	IFLOW ISO VLV 1-FV-061
4.8.10	START the	RHR PUMI	P A(B).	
4.8.11	CLOSE the VLV 1-HV-8	RHR PUMI 3809A (81	P A (B) TO COLD 809B).	LEG 1 & 2 (3 & 4) ISO
4.8.12	OPEN the H 1-HV-8716A pumping.	RHR TRAIN (87168)	N A(B) TO HOT L) for the RHR L	EG CROSSOVER ISO oop to be used for
4.8.13	Slowly OPH 1-HV-0606	CN the P1 (0607)	WR HEAT EXCH OU to obtain the d	TLET for Train A (B) esired flow rate.
4.8.14	At the dea RHR HEAT H	sired lev EXCH OUT	vel in the Refu LET for Train A	eling Cavity, CLOSE th (B) 1-HV-0606 (0607).
4.8.15	STOP the H	RHR PUMP	A(B).	
4.8.16	OPEN the H 1-HV-88092	RHR PUMP A (8809B	A(B) TO COLD L); independent	EG 1&2 (3&4) ISO VLV verification required.
4.8.17	CLOSE and 1-1205-U6 verificat	LOCK RH -027 and ion requ	R Test Recircul 1-1205-U4-226; ired.	ation RWST independent
4,9	OPERATING ITS COLD 1	RHR WIT LEG FLOW	H ONE TRAIN OF PATH ISOLATED F	COLD LEG DISCHARGE WIT OR MAINTENANCE
4.9.1	ENSURE bo per Step	th RHR t 4.5.	rains are lined	l up for recirculation
4.9.2	ENSURE op ISO VLV 1 required.	posite R -HV-8809	HR PMP-A (B) TO A(B) OPEN; inde	OCOLD LEG 1 & 2 (3 & 4 ependent verification
4.9.3	OPEN RHR 1-HV-8716 required.	TRAIN A A and 1-	(B) TO HOT LEG HV+8716B; indep	CROSSOVER ISO Valves endent verification
4.9.4	OPEN brea verificat	kers for ion requ	RHR X-TIE Valv ired:	ves; independent
	Valv	e	Breaker	
	a. 1-HV	-8716A	1ABD-20,	
	b 1_HV	-8716B	188D-20	

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4.9.5	OPEN breake independent	r for cold l verificatio	eg discharg n required:	e ⁻ path in service;
	Valve	Bre	aker	
	a. 1-HV-8	809A 1AB	B-14,	
	Ъ. 1-НV-8	809B 1BB	B-14.	
4.9.6	CLCSE valve for mainten	and OPEN br ance; indepe	eaker for t ndent verif	rain to be isolated ication required:
	Valve	Bre	aker	
	a. 1-HV-8	809A 1AB	B-14,	
	Ъ. 1-HV-8	809B 1BB	B-14.	
4.9.7	MAINTAIN th the system rate.	e running RH as necessary	R Pump in s to maintai	ervice and OPERATE In the desired flow
4.9.8	When RHR Sy desired and following;	stem Cross-'t maintenance independent	ie operatio is complet verificatio	on is no longer ed, PERFORM the on required:
4.9.8.1	CLOSE the frequire1:	ollowing bre	akers; inde	ependent verification
	Breake	r <u>Val</u>	ve	
	a. 1ABB-1	4 1-H	W-8809A,	
		4 1-H	IV-8809B,	
	b. 1888-1			
	b. 1BBB-1c. 1ABD-2	0 1-H	TV-8716A,	

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4.9.8.2	ENSURE the	idle RHR Train is alig	neð as fol	lows:
	a. RWST T 1-HV-8	O RHR A (B) SUCTION 812A (8812B)		CLOSED
	b. RHR PM UPSTRE 1-HV-8 1-HV-8	P A (B) DOWNSTREAM AND AM SUCTION FROM HOT LE 701A (8702A) AND 701B (8702B)	G	OPEN
	c. RHR HE (B) 1-	AT EXCH BYPASS FOR TRA FV-0618 (0619)	IN A	CLOSED IN MANUAL
	d. RHR HE (B) 1-	AT EXCH OUTLET FOR TRA HV-0606 (0607)	IN A	CLOSED
	e. RHR PM 1-FV-0	EP A (B) MINIFLOW ISO V 610 (0611)	ΓV	OPEN
4.9.8.3	START RHR P	ump A (B).		
4.9.8.4	If required be maintain	, SHIFT RHR letdown to ed on cold leg recircu	the train lation as	which is to follows:
	a. MONITO letdow Contro Contro desire	R Letdown Flow 1-FI-01 m and ADJUST the LOW P ller 1-PIC-0131 and/or l Valve 1-HV-0128 as r d letdown flow,	32C while RESSURE LE LETDOWN F equired to	shifting TDOWN ROM RHR maintain
	b. OPEN t train indepe	he RHR To CVCS Letdown which is operating on endent verification req	Isolation minimum fl puired:	of the RHR
	(1) 1 n	-1205-U4-021 if Train minimum flow,	A is opera	ting on
	(2) 1 n	-1205-U4-022 if Train minimum flow.	B is opera	ting on
	c. CLOSE opposi	the RHR To CVCS Letdow te train; independent	m Isolatic verificati	on of the lon required.

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4.9.8.5	SHIFT flow follows:	to the RHR train the	at was just started as
	a. MONITO and 1- 3000 a step,	OR RHR Train A and Tr -FI-0619A and MAINTA and 3500 gpm through	rain B Flow 1-FI-0618A IN <u>total</u> RHR flow between out the remainder of this
	b. ENSUR 1-FV- servi	E the RHR HEAT EXCH 1 0618 (0619) of the t ce is in MAN,	BYPASS for Train A (B) rain being removed from
	c. MONITO flow Contro Contro desire	OR Letdown Flow 1-FI and ADJUST the LOW Pl oller 1-PIC-0131 and ol Valve 1-HV-0128 as ed letdown flow,	-0132C while shifting RHR RESSURE LETDOWN /or LETDOWN FR(M RHR s required to maintain
	d. <u>Slowl</u> I-HV- remov Exchan servi betwe	y THROTTLE the RHR HI 0606 (0607) and Bypa ed from service CLOS nger Bypass of the tr ce OPEN while mainta en 3000 and 3500 gpm	EAT EXCH A(B) OUTLET ss of the train being ED and the RHR Heat rain being placed <u>in</u> ining <u>total</u> RHR flow ,
	e. If RH (1-FV 1-HS- ENSUR	R PMP-A(B) MINIFLOW -0611) does not auto 0610 (1-HS-0611) to E that 1-FV-0610 (1-	ISO VLV 1-FV-0610 open, if required, PLACE OPEN and RELEASE and FV-0611) opens,
	f. When RHR t fully Tempe	the Heat Exchanger O rain being removed f closed, MONITOR RHR rature 1-TR-0612 (06	utlet and Bypass of the rom service are both Heat Exchanger Inlet 13),
	g. When the R	the RHR train has co HR Pump,	oled to below 200°F, STOP
	h. ADJUS 1-FIC appro desir	T Heat Exchanger Byp -0618A (0619A) as re ximately 3000 gpm, t ed.	ass Flow Controller quired to obtain hen PLACE it in AUTO if
4.9.8.6	CLOSE the VALVES 1-H	RHR TRAIN A (B) TO H V-8716A and 1-HV-871	OT LEG CROSSOVER ISO 6B.

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		NC	TE	-
		The followin slowly refil section of t was drained.	g steps wi l the down he RHR loo	ll stream p that
4.9.8.7	CLOSE 1-HV idle train	-8701A (8702	A) and 1-H	V-8701B (8702B) for the
4.9.8.8	OPEN 1-HV-	8812A (B) fo	or the idle	train.
4,9.8.9	Manually O drained; i	PEN 1-HV-830 ndependent v	9A (8809B) verificatio	for the train that was n required.
4.9.8.10	OPEN SIS C 1-HV-8964.	HECK VALVE T	EST CNMT I	SO VALVES 1-HV-8871 and
4.9.8.11	OPEN RHR P (8890B).	MP A (B) CHE	CCK VALVE T	EST VALVE 1-HV-8890A
4.9.8.12	OPEN ACCUM	-1 (3) CHECH	VLV TEST	1-HV-8879A (8879C).
4.9.8.13	OPEN ACCUM	-2 (4) CHECK	VLV TEST	1-HV-8879B (8879D).
4.9.8.14	When venti	ng is comple	eted, CLOSE	the following:
	Train	A	Train B	
	a. 1-HV-	8890A	1-HV-88	90B,
	b. 1-HV-	8879A	1-HV-88	79C,
	c. 1-HV-	8879B	1-HV-88	79D.
4.9.8.15	CLOSE 1-HV	-8871 and 1.	-HV-8964.	
4.9.8.16	CLOSE 1-HV	-8812A (881)	2B).	

4.9.8.17 OPEN 1-HV-8701A (8702A) and 1-HV-8701B (8702B).

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5.0	REFERENCES			
5.1	P&ID's			
5.1.1	1X4DB121	Safety Inject	ion System	
5.1.2	1X4DB122	Residual Heat	: Removal S	ystem
5.2	ELEMENTARY DI	AGRAMS		
5.2.1	1X3D-BD-D02L	1-HV-8804A	Safety I	njection System
5.2.2	1X3D-BD-D02M	1-HV-8804B	Safety I	njection System
5.2.3	1X3D-BD-D02V	1-HV-8809A	Safety I	njection System
5.2.4	1X3D-BD-D02W	1-HV-8809B	Safety I	njection System
5.2.5	1X3D-BD-D03J	1-HV-8840	Safety I	njection System
5.2.6	1X3D-BD-E01A	RHR Pump 001.	-M01	
5.2.7	1X3D-BD-E01B	RHR Puntp 002	-M01	
5.2.8	1X3D-BD-E02C	1-FV-0610	Residual System	. Heat Removal
5.2.9	1X3D-BD-E02D	1-FV-0611	Residual System	. Heat Removal
5.2.10	1X3D-BD-E02E	1-HV-8812A	Residual System	. Heat Removal
5.2.11	1X3D-BD-E02F	-HV-8812B	Residual System	Heat Removal
5.2.12	1X3D-BD-E02G	1-HV-8701A	Residual System	l Heat Removal
5.2.13	1X3D-BD-E02H	1-HV-8701B	Residual System	l Heat Removal
5.2.14	1X3D-BD-E02J	1-HV-8702A	Residua: System	l Heat Removal
5.2.15	1X3D-BD-E02K	1-HV-8702B	Residua System	l Heat Removal
5.2.16	1X3D-BD-E02L	1-HV-8986A	Residua System	l Heat Removal
5.2.17	1X3D-BD-E02M	1-HV-8986B	Residua System	1 Heat Removal

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5.2.18	1X3D-BD-E02N	1-HV-8716A	Residual Heat Removal System	
5.2.19	1X3D-BD-E02P	1-HV-8716B	Residual Heat Removal System	
5.2.20	1X3D-BD-E03F	1-HV-8811A	Residual Heat Removal System	
5.2.21	1X3D-BD-E03G	1-HV-8811B	Residual Heat Removal System	
5.2.22	1X3D-BD-E03H	1-HV-10465/ 10466	Residual Heat Removal System	
5.3	PROCEDURES			
5.3.1	11011-1	"Residual Hea	t Removal System Alignment'	11
5.3.2	13405-1	"125V DC 1E E System"	lectrical Distribution	
5.3.3	13427-1	"4160V AC 1E System"	Electrical Distribution	
5.3.4	13429-1	"480V AC 1E E System"	lectrical Distribution	
5.3.5	13711-1	"Instrument A	ir System"	
5.3.6	13715-1	"Component Co	ooling Water System"	
5.3.7	13150-1	"Nuclear Serv	vice Cooling Water"	
5.4	CORRESPONDENC	E		
5.4.1	GP-12615	RHRS Open Per	rmissive Setpoint	
5.4.2	PFE0-01628	Operation Of During Single	The Recycle Evaporator Train Cooldown	
5.4.3	PFE0-805	Fire Induced HV-8804B	Opening Of HV-8804A And	
5.4.4	BW-4979	Fire Induced HV-8804B	Opening Of HV-8804A And	

END OF PROCEDURE TEXT

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			Sheet 1 of 1
		CHECKLIST 1	
	RHR AI	LIGNMENT FOR FILLING AND VE	NTING
CONTROL VALVE N	SWITCH/ UMBER	DESCRIPTION	POSITION
1-HS-06	20(0621)	RHR PMP A(B)	PULL-TO- LOCK
1-HV-87	01A(8702A)	RHR PMP A(B) DOWNSTREA SUCTION FROM HOT LEG 1 1(4)	AM CLOSED LOOP
1-HV-87	01B(8702B)	RHR PMP A(B) UPSTREAM SUCTION FROM HOT LEG 1(4)	CLOSED
1-HV-10	465(10466)	RHR SUCT VENT LINE TR	N A(B) CLOSED
1-HV-88	12A(8812B)	RWST TO RHR PUMP A(B) SUCTION	CLOSED
1-HV-88	11A(8811B)	CNMT SUMP TO RHR PMP . SUCTION	A(B) CLOSED
1-HV-88	09A(8809B)	RHR PUMP A(B) TO COLD 1&2 (3&4) ISO VLV	LEG CLOSED
1-HV-88	04A(8804B)	RHR PMP A DISCH TO CH PMPS SUCT (RHR TO SI ISO VLV)	G CLOSED PMP B
1-HV-87	16A(8716B)	RHR TRAIN A(B) TO HOT CROSSOVER ISO	LEG CLOSED
1-HV-88	40	RHR TO HL ISO VLV	CLOSED

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	CHECKLIST 2	**	Sheet 1 of	E 1
	RHR ALIGNMENT FOR STANDB	Y READINESS		
CONTROL SWITCH/ VALVE NUMBER	DESCRIPTION	POSITION	POSITIONED BY	<u> </u>
1-HS-0620(0621)	RHR PMP A(B)	AUTO		-
1-HV-8701A(8702A)	RHR PMP A(B) DOWNSTREAM SUCTION FROM HOT LEG LOOP 1(4)	CLOSED		without the second
1-HV-8701B(8702B)	PAR PMP A(P) UPSTREAM SUCTION FROM HOT LEG LOOP 1(4)	CLOSED		
1-HV-10465(10466)	RHR SUCT VENT LINE TRN A(B)	CLOSED		
1-HV-8812A(8812B)	RWST TO RHR PUMP A(B) SUCTION	OPEN	wares an analysis and the	
1-HV-8811A(8811B)	CNMT SUMP TO RHR PMP A(B) SUCTION	CLOSED		adpathase
1-HV-8809A(8809B)	RHR PUMP A(B) TO COLD LEG 1&2 (3&4) ISO VLV	OPEN	and a strange of the state of t	•
1-HS-8809C(8809D)	RHR PUMP A(B) TO COLD LEG 1&2 (3&4) ISO VLV	OFF		
1-HV-8804A(8804B)	RHR PMP A DISCH TO CHG PMPS SUCT (RHR TO SI PMP B ISO VLV)	CLOSED		
1-HV-8716A(8716B)	RHR TRAIN A(B) TO HOT LEG CROSSOVER ISO	OPEN	adampina ang atao da pangana	
1-HV-8840	RHR TO HL ISO VLV	CLOSED		
1-HS-8840A	RHR TO HL ISO VLV	OFF		
1-HV-0606(0607)	RHR HEAT EXCHANGER TRAIN A(B) OUTLET	OPEN		
1-FV-0618(0619)	RHR HEAT EXCHANGER TRAIN A(B) BYPASS	MAN & CLOSED		

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