STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

EMERGENCY INSTRUCTION SO1-1.2-1.11

SI TERMINATION FOLLOWING LOSS OF REACTOR COOLANT

I. PURPOSE:

The purpose of this instruction is to provide a method to terminate safety injection after a LOCA where pressure can be maintained by charging pumps once RCS conditions have stablized to SI termination criteria. Normal charging and letdown will be established. Guidance is provided to insure controlled plant conditions are maintained by monitoring the need to reinitiate safety injection.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Foldout page should be open.

CAUTION

If offsite power is lost after SI is reset, manual SI initiation will be necessary to load safeguard equipment onto the diesel powered 4 KV busses.

1	Verify SI Reset:	
	a. SLSS surveillance panel load group lights - ON.	a. Reset SI at SLSS surveillance panels.
	b. Verify lockout switches - RESET.	b. Manually reset lockout switches.
2	Stop SI System Pumps:	
	a. Stop both feed pumps.	
	b. Stop both SI pumps.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION
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AFW pump water supply must be maintained to ensure adequate heat sink.

3	Check CST Level:		
	a. CST Level - GREATER THAN 4 FT.		a. IF CST level low, THEN transfer to alternate AFW water supply per to SO1-7-3, AUXILIARY FEEDWATER SYSTEM.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify SI Reinitiation NOT Required:	
	a. RCS pressure - INCREASING ABOVE 1400 PSIG.	• Manually reinitiate SI. Go to SO1-1.2-1.0, REACTOR TRIP OR SAFETY INJECTION, step 5.
	b. Pressurizer level - GREATER THAN 20%.	
	c. RCS subcooling - GREATER THAN 40 °F.	
5	Check Steam Generator Levels:	
	a. Narrow range level - GREATER THAN 26%.	a. IF less than 26%, THEN maintain. 1) Total AFW flow - GREATER THAN 250 GPM. 2) AFW flow per SG - LESS THAN 150 GPM.
	b. Throttle AFW flow to maintain narrow range level at 50%.	b. IF narrow range level in one SG continues to increase THEN secure AFW to that SG.
6	Verify Offsite Power Available:	
	a. 220 KV switchyard voltage - NORMAL.	a. IF low, THEN go to SO1-1.7-1, LOSS OF OFFSITE POWER/STATION BLACKOUT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Reset Containment Isolation:	
	a. Containment pressure is - LESS THAN 1.4 PSIG.	a. IF high, THEN depress override pushbuttons for valves needed open as containment systems are placed in service. Go to step 8.
	b. Depress Train A AND B containment isolation reset pushbuttons.	
8	Verify Charging Established:	
	a. One charging pump breaker - CLOSED.	a. Start standby charging pump.
	b. Reset non running charging pump lockout.	
9	Align VCT Makeup Control System:	
	a. Set makeup controller for a boron concentration - GREATER THAN RCS BORON CONCENTRATION.	
	b. Makeup set for automatic.	b. Adjust controls as appropriate.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Verify CCW System Operating Properly:	
	a. Two CCW pump breakers - CLOSED.	a. Manually start pumps.
	b. CCW flow indication - GREATER THAN 1620 GPM.	b. IF low, THEN start third CCW pump.
	c. CCW low pressure alarm - RESET.	c. IF low, THEN start third CCW pump.
11	Align Letdown System:	
	a. Place inservice RHR heat exchanger temperature controller to - MANUAL, SET AT 25% OPEN.	
	b. Place letdown pressure controller PCV 1115 to - MANUAL, SET AT 50% OPEN.	
	c. Open RCS letdown CV 525 AND CV 526.	
	d. Verify LCV 1112 - OPEN.	d. Manually open valve.
	e. Verify LCV 1100A control switch - AUTO.	e. Manually position switch.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Place Letdown In Service:	
	a. Open an orifice isolation valve AND manually adjust letdown pressure and temperature to stable conditions.	
	b. Place letdown pressure controller PCV 1105 to - AUTO, SET AT 350 PSIG.	
	c. Place inservice RHR heat exchanger temperature controller to - AUTO, SET AT 120 °F.	
13	Align Charging Pump Suction To VCT:	
	a. Verify VCT level - GREATER THAN 22%.	a. Manually restore level.
	b. Open MOV 1100 C.	
	c. Close MOV 1100 B AND D.	
	d. Place control switches for MOV 1100 B, D AND C in AUTO.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check RCP Cooling:	
	a. RCP low CCW flow alarms - RESET.	a. Manually adjust CCW flow.
	b. RCP Seal injection flow established with RCP thermal barrier delta pressures - GREATER THAN 10 INCHES.	b. Establish seal water. Place flow controllers in AUTO set to maintain a positive delta pressure.
	c. Open RCP seal return CV 527 AND CV 528.	
	d. Verify seal leakoff is - LESS THAN 4.5 GPM.	d. Place PCV 1115 A, B AND C in AUTO.
15	Establish Pressurizer Level Control:	
	a. Verify charging flow controller FCV 1112 in AUTO, CASCADE CONTROL.	
	b. Place pressurizer level controller LC430F in AUTO, MAN SET AND set at 50%.	
16	Establish Pressurizer Pressure Control:	
	a. Verify pressurizer pressure controller in - AUTO, SET AT 2085 PSIG.	a. Manually position controller.
	b. Energize one control and one backup set of pressurizer heaters.	
	c. Place remaining control and backup set of pressurizer heaters in AUTO.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check RCS Subcooling:	
	a. RCS subcooling - GREATER THAN 50 °F.	a. Dump steam to establish greater than 50 °F subcooling. Do not exceed RCS cooldown rate greater than 50 °F/HR.

CAUTION
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If possible RCPs should be run such that pressurizer spray capability is assured.

18	Establish Conditions For RCP Operation:	
	a. Start at least one RCP per SO1-1-3, REACTOR COOLANT PUMP OPERATION.	a. IF an RCP cannot be started, THEN go to step 19.
	b. IF at least one RCP is RUNNING, THEN go to step 20.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Verify For RCS Natural Circulation Using Trended Values:	
	a. RCS subcooling - GREATER THAN 50 °F.	o Attempt to establish natural circulation by increasing steam dump.
	b. Steam pressure - STABLE.	
	c. RCS cold leg temperature - STABLE OR SLOWLY DECREASING AND NEAR SATURATION TEMPERATURE FOR STEAM HEADER PRESSURE.	
	d. Core exit TCs - STABLE OR SLOWLY DECREASING.	
	e. Refer to SO1-3-6, PLANT OPERATION WITH NATURAL CIRCULATION.	
20	Check Intermediate Range Flux:	
	a. Flux - LESS THAN 2×10^{-9} AMPS.	a. Continue with step 21. WHEN flux decreases below 2×10^{-9} amps, THEN perform steps 20.b AND 20.c.
	b. Verify source range detectors high voltage - ON.	
	c. Transfer NIS recorders to source range.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Verify SI Reinitiation NOT Required: a. RCS pressure - GREATER THAN 1400 PSIG. b. Pressurizer level - GREATER THAN 20%. c. RCS subcooling - GREATER THAN 50 °F.	• Manually reinitiate SI. Go to SO1-1.2-1.0, REACTOR TRIP OR SAFETY INJECTION, step 5.
22	Return SI Valving To Standby Status: a. Close MOVs 850 A, B AND C. b. Close HV 851 A AND B. c. Close HV 853 A AND B. d. Close CV 875 A AND B. e. Close SV 2900 AND SV 3900. f. Close bonnet vent block valves for HV 853 A AND B.	
23	Maintain Stable Plant Conditions: a. Pressurizer pressure - STABLE. b. Pressurizer level - STABLE. c. Steam generator narrow range level - AT APPROXIMATELY 50%.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

24 Investigate Cause of SI:

a. Emergency Coordinator will determine cause of SI.

b. Evaluate long term plant status.

25 Shut Down Unnecessary Plant Equipment And Align Plant Systems For Cooldown:

a. Go to SO1-1.2-1.01, REACTOR TRIP RECOVERY, step 4.

-END-

H. E. MORGAN
MANAGER, STATION OPERATIONS

MOTOR DRIVEN AFW PUMP RESTART CRITERIA

a. IF a motor driven AFW pump trips on low discharge pressure, THEN:

1) Lower AFW flow controllers.
2) Reset AND restart pump.

SI TERMINATION CRITERIA FOLLOWING LOSS OF REACTOR COOLANT

a. Terminate SI when ALL parameters listed below are met:

1)	RCS Pressure	- GREATER THAN 1400 PSIG.
2)	RCS Subcooling	- 40 °F.
3)	Pressurizer Level	- GREATER THAN 50%.
4)	Heat Sink:	
	(a) SG Level	- 10% N. R.
	OR	
	(b) AFW Flow	- 250 GPM.

SI REINITIATION CRITERIA FOLLOWING LOSS OF REACTOR COOLANT

a. Reinitiate SI if ANY ONE of the parameters listed below occurs:

1)	RCS Pressure	LESS THAN 1400 PSIG.
2)	RCS Subcooling	LESS THAN 40 °F.
3)	Pressurizer Level	LESS THAN 20%.

COLD LEG RECIRCULATION SWITCHOVER CRITERIA

a. IF RWST level less than 21%, THEN align SI system for cold leg injection and recirculation per SO1-1.2-1.13, TRANSFER TO COLD LEG INJECTION AND RECIRCULATION.

SYMPTOMS FOR RESPONSE TO INADEQUATE CORE COOLING

a. Go to SO1-1.2-14, RESPONSE TO INADEQUATE CORE COOLING, when ANY ONE of the following symptoms occur:

1) Five or more core exit TCs - GREATER THAN 1200 °F.

OR

2) RCS hot leg temperatures - GREATER THAN 700 °F.

SYMPTOMS FOR RESPONSE TO LOSS OF SECONDARY HEAT SINK

a. Go to SO1-1.2-15, RESPONSE TO LOSS OF SECONDARY HEAT SINK, IF AFW Flow is NOT AVAILABLE.

IF EVENTS REQUIRE IMPLEMENTATION OF THIS PROCEDURE

a. Notify Watch Engineer.
b. Notify Shift Technical Advisor.
c. Notify Shift Communicator.
d. Determine if event is classified as an emergency and requires notification of offsite agencies and implementation of the Emergency Plan per SO123-VIII-11, RECOGNITION AND CLASSIFICATION OF EMERGENCIES.
e. IF event is NOT classified as an emergency in d above THEN determine if notification of the NRC is required within one hour per SO1-14-13, NOTIFICATION TO NRC OF SIGNIFICANT EVENTS.