

Pacific Gas and Electric Company

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REVISION 1
DATE 5/26/81
PAGE 1 OF 28



DEPARTMENT OF NUCLEAR PLANT OPERATIONS
DIABLO CANYON POWER PLANT UNIT NO(S) 1 AND 2
EMERGENCY OPERATING PROCEDURE
LOSS OF SECONDARY COOLANT

TITLE

APPROVED

PLANT MANAGER

U

DATE

SCOPE

This procedure covers the operating steps to be taken in the event of a Loss of Secondary Coolant. It is assumed that reactor trip and safety injection actuations have occurred. The operator should have already performed Emergency Operating Procedure No. OP-0.

SYMPTOMS

(See OP-0 Symptoms/Diagnostics)

AUTOMATIC ACTIONS

(See OP-0)

OBJECTIVES

1. To establish stabilized reactor coolant system and steam generator conditions prior to plant cooldown.
2. To minimize the energy release due to the break by isolation of the break where possible.
3. To prevent the pressurizer safety valves from lifting by dumping steam from all steam generators to the main condenser when possible or to the atmosphere from the unaffected steam generators.
4. To isolate the auxiliary feedwater flow to the affected steam generator, to maximize auxiliary feedwater flow to the intact steam generators, and to minimize the energy release.
5. To borate the reactor coolant to establish and maintain reactor shutdown margin.

IMMEDIATE OPERATOR ACTIONS

1. Perform the immediate operator actions in the reactor trip with Safety Injection Emergency Procedure OP-0.



SUBSEQUENT OPERATOR ACTIONSACTIONSCOMMENTS

1. Initiate the site Emergency alarm.
2. If the pressurizer PORV's open at any time during this procedure, verify reclosure when the RCS pressure falls below the PORV setpoint. Isolate the PORV if the valve fails to close. If the valve remains open and cannot be isolated, go to OP-1.
3. Verify main steam line isolation. If main steam line isolation has not occurred, close the following valves.

3. Closing the valves helps verify the faulted steam generator.

Steam Generator No. 1

FCV-41 Steam line isolation valve

FCV-25 Isolation valve bypass

FCV-760 IC blowdown valve

Steam Generator No. 2

FCV-42 Steam line isolation valve

FCV-24 Isolation valve bypass

FCV-761 IC blowdown valve

Steam Generator No. 3

FCV-43 Steam line isolation valve

FCV-23 Isolation valve bypass

FCV-762 IC blowdown valve

Steam Generator No. 4

FCV-44 Steam line isolation valve

FCV-22 Isolation valve bypass

FCV-763 IC blowdown valve

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4. Verify 10% atmospheric steam dumps open to hold steam generator pressures below the safety valves.
5. If the RCS pressure stabilizes above the shutoff head of the RHR pumps, reset safety injection and shutdown both RHR pumps. Continue to monitor the RCS pressure and restart these pumps if the RCS pressure drops to the shutoff head of the pumps.
5. CAUTION: 1) Automatic reinitiation of safety injection will not occur after this step since the reactor trip breaker are open. If the operator has indication that an SI is required after this step, he must initiate it manually.
- CAUTION: 2) If loss of off-site power occurs after resetting safety injection, it will be necessary to load the safeguards equipment onto the vital busses manually. If safety injection is reinitiated manually after the loss of off-site power, the vital busses will automatically sequentially load the safeguard equipment. If loss of off-site power occurs, go to Appendix E (Blackout with SI Emergency Loading of Diesel Generators).
6. If W.R. RCS pressure decays below 1220 psig or is below 1220 psig and stable.
6. NOTE: The conditions for stopping RCP must be continuously monitored throughout the transient.
- a. Again verify a minimum of one charging pump delivering flow and one SI pump delivering flow to the RCS,
- b. THEN STOP all four reactor coolant pumps. Maintain seal water flow to the RCP seals.
- c. Close the Centrifugal Charging pump recirculation valves (8105 & 8106).
- c. If the RCS pressure is stored above 2000 psig, open 8105 & 8106 to protect the pumps from damage.
- d. If component cooling water to the RCP's is isolated due to a containment phase B isolation, stop all RCP's within 5 minutes and maintain seal flow as above.

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ACTIONS

COMMENTS

7. Monitor steam generator pressures to determine the faulted steam generator. If one steam generator has a low steam generator pressure, terminate AFW flow to that steam generator.

7. The low pressure steam generator is the faulted steam generator.

Steam Generator No. 1 Low Pressure

Close LCV's 106 and 110.

Steam Generator No. 2 Low Pressure

Close LCV's 107 and 111.

Steam Generator No. 3 Low Pressure

Close LCV's 108 and 115.

Steam Generator No. 4 Low Pressure

Close LCV's 109 and 113.

If all steam generators are depressurized or depressurizing, maintain AFW flow to all steam generators until the faulted steam generator is identified.

8. If all steam generator pressures are stable.

- a. Dispatch an operator to inspect the feedwater and main steam lines for a possible break. If a break is found, continue with step 10.

- a. AFW flow to the individual steam generators may supply additional information as to the break location.

9. If a break is not found, return to Accident Diagnostics step 3 in OP-0.

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10. Verify AFW flow to all nonfaulted steam generators. Maintain maximum AFW flow until steam generator narrow range level indicators are reading on scale.
11. If steam generator water level increases in an unexpected manner on one steam generator, go to OP-3A steam generator tube rupture.
12. Monitor the condensate storage tank and upon reaching approximately 10% level, perform a. or b. below.
 - a. Verify a level in the raw water storage reservoir; then open FCV-436 and FCV-437 (Reservoir supply to AFW pumps). Allow the AFW pumps to run during the transfer. Monitor the AFW flow closely. If AFW flow is lost, trip all 3 AFW pumps until the transfer is complete, then restart the pumps.
 - b. If the raw water storage reservoir is not available, go to Appendix C (AFW Pump suction Supply from Fire Water Tank Procedure). Allow the AFW pumps to run during the transfer. Monitor the AFW flow closely. If AFW flow is lost, trip all 3 AFW pumps until the transfer is complete, then restart the pumps.
12. If the 10 to level alarm occurs on the CST, the operator has approximately 25 minutes to perform items a. or b.
13. If containment spray has been initiated and containment pressure has decreased to less than 22 psig.
 - a. Reset Train A and Train B containment spray actuation.
 - b. Verify all CFCU's running on low speed.
 - c. Stop both C.S. pumps.
 - d. Close spray additive valves.
14. If containment spray has been initiated and containment pressure remains above 22 psig, reset containment spray signal and cancel the spray additive. Close valves 8994A&B. Monitor RWST level throughout this procedure and when the RWST low level alarm 33% is annunciated, perform a. to d. below.

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ACTIONSCOMMENTS

- a. Verify RHR pumps trip if they are running.
- b. Perform Appendix A (SI Injection/Recirculation Changeover Procedure).
- c. Continue to spray with the C.S. pumps without additive until the RWST 10 10 level alarm is annunciated, then shutdown the containment spray pumps.
- d. After the changeover to cold leg recirculation, use the RHR to continue to spray containment until containment pressure is less than 22 psig. Verify CFCU's running on 10 speed prior to terminating containment spray.

15. Terminate safety injection if criteria A, B or C below can be met. Monitor and stay within the Technical Specifications heatup/cool-down curves while trying to meet the criteria for terminating SI.

A.

- 1) One wide range RCS loop THOT is $< 350^{\circ}\text{F}$. If possible, confirm by core exit thermocouples.
- 2) AND wide range RCS pressure > 700 psig and stable or increasing,
- 3) AND PZR level $> 22\%$ and rising,
- 4) AND subcooled margin meter reading $> 35^{\circ}\text{F}$ subcooled,

15. Conditions for termination should be continuously monitored throughout these instructions. If all steam generators are depressurized or depressurizing, do NOT terminate SI until the faulty steam generator is identified.

1) Attempt to maintain temperature $< 350^{\circ}\text{F}$. If the criteria described in A are used for termination of safety injection and the reactor coolant temperatures increase to $> 350^{\circ}\text{F}$, maintain the safety injection pumps in operation until all criteria for "C" below are satisfied.

4) If the subcooling margin monitor becomes INOPERATIVE or suspect, use the saturation curve to determine subcooling.

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5) AND auxiliary feedwater flow has been isolated to all depressurized steam generators and a) or b) is satisfied below.

a) AFW flow to the unfaulted steam generators is greater than 205 gpm per steam generator,

b) OR one steam generator narrow range water level is greater than 10%.

8.

1) ALL wide range RCS loop T_{HOT} are >350°F,

2) AND W.R. RCS pressure >2000 psig stable or increasing,

3) AND PZR level >22%,

4) AND subcooled margin meter reading >35°F subcooled,

5) AND auxiliary feedwater flow has been isolated to all depressurized steam generators and a) or b) is satisfied below.

a) AFW flow to the unfaulted steam generators is greater than 205 gpm per steam generator

b) OR one steam generator narrow range water level is greater than 10%

6) AND containment pressure and containment radiation and containment recirc sump DO NOT exhibit abnormally high or increasing readings. If containment conditions are increasing, continue SI until criteria C can be met.

ACTIONSCOMMENTS

C.

- 1) All wide range RCS loop T_{HOT} are $\geq 350^{\circ}\text{F}$,
 - 2) AND W.R. RCS pressure ≥ 2000 psig stable or increasing,
 - 3) AND PZR level $> 50\%$,
 - 4) AND subcooled margin meter reading $> 35^{\circ}\text{F}$ subcooled,
 - 5) AND auxiliary feedwater flow has been isolated to all depressurized steam generators and a) or b) is satisfied below.
 - a) AFW flow to the unfaulted steam generators is greater than 205 gpm per steam generator
 - b) OR one steam generator narrow range water level is greater than 10%
 - 6) AND containment pressure or containment radiation or containment recirc. sump exhibit abnormally high or increasing readings.
- 6) If all steam generators are depressurized or depressurizing, do NOT terminate SI until the faulted steam generator is identified.

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ACTIONSCOMMENTS

16. If criteria A,B or C above is met and SI has not been reset, reset the SI signal and stop the RHR and SI pumps. Stop one charging pump at a time and evaluate RCS pressure. Maintain sufficient charging flow to supply adequate seal injection flow.
16. CAUTION: 1) Automatic reinitiation of safety injection will not occur after this step since the reactor trip breakers are open. If the operator has indication that a SI is required after this step, he must initiate it manually.
17. Continue to monitor the RCS conditions.
- a. IF, RCS W.R. pressure decreases by 200 psig,
- b. OR, PZR level decreases by 10% unexpectedly from SI termination point,
- c. OR, indicated subcooling $< 35^{\circ}\text{F}$,
- d. THEN, manually reinitiate SI pump operation to maintain RCS pressure and PZR level and return to Accident Diagnostic Section of OP-0. -
- e. Safety injection may be terminated after the restart when reactor coolant pressure is being controlled to the nominal value which exists when safety injection was initially terminated ($T_H < 350^{\circ}\text{F}$) or to a value greater than or equal to 2000 psig ($T_H > 350^{\circ}\text{F}$) and when the reactor coolant indicated subcooling is greater than 50°F .
18. If RCS conditions remain stable perform the following steps.
- a. Reset containment isolation phase A.
- b. If RCP's have been stopped, and W.R. RCS pressure is greater than 1220 psig, establish conditions for starting RCP's and start at least one RCP associated with an unfaulted steam generator.
- c. Verify AC turbine bearing oil pump and Hi pressure seal oil backup pump running after oil pressure decays to 11 psig and turbine bearing oil pump starts at 600 RPM turbine speed.
- b. Start pump 1-1 or 1-2 if associated with an unfaulted loop so that PZR spray is effective.
- NOTE: If the Centrifugal Charging pump recirc valves (8105 & 8106) were closed in Step 6, reopen these valves if RCS pressure restored above 2000 psig.

ACTIONSCOMMENTS

- d. Establish normal charging.
- 1) Open instrument air valves FCV-684 & 682.
 - 2) Check open normal charging valve 8146
 - 3) Close or check closed charging to auxiliary spray valve 8145.
 - 4) Open charging line isolation valves MO-8107 & 8108.
 - 5) Adjust HCV-142 & FCV-128 or reciprocal charging pump speed to achieve RCP seal flow and charging flow as required to maintain pressurizer level greater than 22%.
 - 6) Open RCP seal return valves, MO-8100 & 8112. Check seal flow normal.
 - 7) Check open or open centrifugal charging pump recirculation valves.
- e. Establish normal letdown.
- 1) Open letdown valves LCV-459 & 460.
 - 2) Open letdown isolation valve 8152.
 - 3) Open one 75 gpm letdown orifice valve.
 - 4) Verify PCV-135 opening by observing letdown flow.
- f. Close the BIT inlet and outlet valves MO 8803A & B, and MO 8801 A & B.
- g. Establish VCT makeup and transfer charging pumps suction to VCT.
- 1) Adjust VCT makeup blend to the no-load concentration.
 - 2) Open VCT outlet valves LCV-112B and C.
 - 3) Close RWST to charging pump suction valves 8805A & B.

ACTIONSCOMMENTS

- 4) Verify divert valve LCV-112A in AUTO.
- h. Verify or establish normal charging to maintain PZR level at 22% and W.R. RCS pressure at the value reached when SI was terminated or 2000 psig. Reestablish PZR heaters and return to automatic level and pressure control only after containment conditions are such that proper operation of the control systems can be verified.
- i. Stop all 3 diesel generators if off-site power available and place diesel generator control switches in AUTO.
- j. Place the main and feedpump turbines on turning gear at 0 RPM speed.
19. Borate the RCS to the cold Xe free condition, if required.
20. If the nonfaulted steam generator levels have returned to the narrow range regulate AFW flow to maintain levels in the narrow range.
21. Verify 50°F subcooling on the RCS subcooling meter. If 50°F subcooling is present, go to step 24.
22. If 50°F subcooling is not present, attempt to establish 50°F subcooling with method a. or b. below.
- a. Dump Steam to the Condenser.
If the break is inside the MSIV's or if a feedwater line break was found, open the M.S. isolation valves from the unfaulted steam generators. Reset the steam dump control to the steam header pressure control mode. Lower the control setpoint to establish 50°F subcooling while maintaining less than 50°F HR RCS cooldown rate.
- a. This is the preferred method.
- Safety injection pump operation should be reinitiated if an uncontrolled drop in RCS pressure or pressurize level occurs during the cooldown process.

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- During the controlled cooldown the low RCS pressure criteria for tripping RCP's will not apply.
- b. Dump Steam to the Atmosphere.
If the break is outside the main steam isolation valves, lower the setpoint on the 10% atmospheric steam dump valves from the unfaulted steam generators to establish 50°F subcooling while maintaining <50°F/HR RCS cool-down rate.
- b. The steam generator blow-down radioactive levels should be checked prior to dumping steam to the atmosphere. If hi radiation is found in a steam generator use the remaining unfaulted steam generators to cool the plant. However, if no other method of cooldown is possible, dump steam to the atmosphere regardless of the radiation levels in the steam generator blowdown.
23. If 50°F subcooling cannot be achieved, reinitiate safety injection and go to OP-0 Diagnostics and reevaluate the accident
24. If RCP's are not running, establish conditions for starting the pumps and start at least one reactor coolant pump not associated with the faulted steam generators.
24. The lo RCS pressure RCP trip criteria will not apply during the cooldown. Start RCP's 1 or 2 if possible, so that pressurizer spray is possible.
25. If 50°F subcooling is present and can be maintained, proceed with a normal cool-down using Operating Procedure L-5.
25. Reinitiate SI if an uncontrolled RCS depressurization or PZR level decreases during the plant cooldown.

APPENDIX A

SI INJECTION/RECIRCULATION CHANGE OVER PROCEDURESUBSEQUENT OPERATOR ACTIONSACTIONS

1. All steps listed below must be carried out expeditiously, in a precise orderly sequence. Do not interrupt the operation until all actions are completed. When both ECCS trains are initially available and a valve fails to respond or to complete its demanded operation, postpone any corrective action until the subsequent operational steps are performed.
2. Monitor RWST level closely. If the RHR pumps do not trip at approx. 33%, trip them manually.
3. If during this operation the RWST approaches a 0% level, stop all pumps taking suction from the RWST. Restart pumps after the RHR system is aligned to provide suction.
4. At the vital 480 volt load centers F and H, close the breakers for the following valves if not already performed.

8980 RHR pumps supply from RWST 52-1F-31.

8976 SI pumps supply from RWST 52-1H-20.
5. Reset SI and Phase B isolation signals if not already reset.
6. If off-site power is available, shutdown all 3 diesel generators and leave them in AUTO if this has not been performed.

COMMENTS

1. CAUTION: If a loss of off-site power has occurred in coincidence with this procedure and all 3 diesel generators are running and supplying the vital busses, continue with these instructions as written. If a diesel generator has failed, go to Appendix B (Loss of Off-site Power with Loss of Diesel Generator) for additional guidance before proceeding.

4. This step may be delayed until time permits.

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APPENDIX A (cont)

ACTIONSCOMMENTS

7. Close (cut in) the series contactors for the following valves from the toggle switches in the control room if not already CUT IN.
- 8809 A & B RHR pumps injection to cold legs.
- 8974 A & B SI pumps recirculation.
- 8982 A & B RHR pumps suction from sump.
8. With the SI, charging and possibly the spray pumps still taking suction from the RWST and the RHR pumps tripped at 33% in the RWST, proceed to transfer RHR suction to the containment sump as follows in steps 9 thru 29.
8. Monitor RWST level, trip all pumps taking suction from the RWST upon reaching 0% level in the tank. Restart pumps after RHR suction supplied.
9. Check that the containment recirculation sump level indicators read at least 40% to provide adequate NPSH to the RHR pumps.
10. Close the two RHR heat exchanger outlet cross-tie valves (3716A & B).
11. Close the No. 2 RHR pump normal suction valve (8700B).
12. Open the No. 2 RHR pump suction valve from the containment recirculation sump (8982B).
13. Open the component cooling water outlet valve from No. 2 RHR heat exchanger (FCV-364).
14. Restart No. 2 RHR pump and check flow to the vessel.
15. Close the safety injection pump recirculation valves (8974A & B).

APPENDIX A (cont)

<u>ACTIONS</u>	<u>COMMENTS</u>
16. Open the safety injection pump suction from RHR pump No. 1 (8804B). Check for increased safety injection pump flow and pressure.	
17. Close the safety injection pumps normal suction valve (8976) from the RWST.	17. This step may be delayed if breakers in step 4 have not been racked in.
18. Open the alternate suction valves for the centrifugal charging pumps (8807A & B).	
19. Close the No. 1 RHR pump normal suction valve (8700A).	
20. Open the No. 1 RHR pump suction valve from the containment recirculation sump (8982A).	
21. Check the level in the recirculation sump again for adequate NPSH.	
22. Open the component cooling water outlet valve from No. 1 RHR heat exchanger (FCV-365).	
23. Restart the No. 1 RHR pump and check for flow to the vessel.	
24. Open the centrifugal charging pumps alternate suction valve from RHR pump No. 1 (8804A). Check for increased charging pump flow and pressure.	
25. Close the charging pumps normal suction valves from the RWST (8805A & B).	
26. Close the RHR pumps normal supply valve from the RWST (8980).	26. This step may be delayed if breakers in step 4 have not been racked in.

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APPENDIX A (cont)

<u>ACTIONS</u>	<u>COMMENTS</u>
27. When the lo lo level point is reached in the RWST, trip both containment spray pumps.	27. Trip any other engineered safeguard pumps that are still taking suction from the RWST. This will only be necessary if the preceding steps have not been completed prior to reaching the lo lo level setpoint.
28. If steps 4, 17 and 26 were delayed, perform these steps at this time.	
29. If either RHR pump failed, either containment sump to RHR suction valve failed to open (valves 8982A or B) or either RHR Train to centrifugal charging pumps or SI pumps suction valves 8804A or B failed to open, go to Appendix D (RHR Train Failure).	
30. Return to the procedure step that was left to perform this Appendix.	

APPENDIX B

LOSS OF OFF-SITE POWER DURING LOCA WITH LOSS OF DIESEL GENERATORACTIONSCOMMENTS

- A. If a diesel generator fails during this procedure, continue with the procedure as written until Appendix A (SI Injection/Recirculation Change Over Procedure) is to be performed. Then follow the guidance given below for the alignment for cold leg and hot leg recirculation.
- B. Diesel Generator Failure

Diesel Generator 1-1 Failure

1. If diesel generator 1-1 has failed, the following steps should be used to align the system for cold leg recirculation.

- a. Verify the following pumps are running.

ASW Pumps 1 and 2
AFW Pump 3
Charging Pumps 1 and 2
CCW Pumps 1 and 2
SI Pump 1
C.S. Pump 1
RHR Pump 1

- b. With diesel generator 1-1 failed, do the following steps in the order given below in Appendix A (SI Injection/Recirculation Change Over Procedure).

Steps: 2,3,4,5,7,8,9,10,15,18,
19,20,21,22,23,24,25,26,27,28
then do step 17.

APPENDIX B (cont)

ACTIONSCOMMENTS

- c. Throttle HCV-638 to provide adequate suction for the SI and charging pumps (approximately 20 psig above containment pressure while maintaining RHR pump motor current less than 57.5 amps).
- d. The cold leg recirculation flow path would be as follows.

RHR pump 1 from containment sump to cold legs 1 and 2,
 SI pump 1 from RHR pump 1 to all cold legs, charging pump 1 and 2 from RHR pump 1 to all cold legs via the BIT.

Containment spray pump 1 from RWST to spray headers.

Diesel Generator 1-2 Failure

1. If diesel generator 1-2 has failed the following steps should be used to align the system for cold leg recirculation.
- a. Verify the following pumps are running.
- ASW Pump 1
 - AFW Pumps 2 and 3
 - Charging Pump 1
 - CCW Pumps 1 and 3
 - SI Pumps 1 and 2
 - C.S. Pump 2
 - RHR Pump 2

APPENDIX B (cont)

ACTIONSCOMMENTS

- b. With diesel generator 1-2 failed, do the following steps in the order given below in Appendix A (SI Injection/Recirculation Change Over Procedure).

Steps: 2,3,4,5,7,8,9,10,11,12,13,14,15,16,17,18,25,26,27,28.

- c. Throttle HCV-637 to provide adequate suction for the SI and charging pumps (approximately 20 psig above containment pressure while maintaining RHR pump motor current less than 57.5 amps).

- d. The cold leg recirculation flow path would be as follows.

Containment spray pump 2 from RWST to spray headers. RHR pump 2 from containment sump to cold legs 3 and 4, SI pumps 1 and 2 from RHR pump 2 to all cold legs, charging pump 1 from RHR pump 2 to all cold legs via the BIT.

Diesel Generator 1-3 Failure

1. If diesel generator 1-3 has failed, the following steps should be used to align the system for cold leg recirculation.

- a. Verify the following pumps are running.

ASW Pump 2
AFW Pump 2
Charging Pump 2
CCW Pumps 2 and 3
SI Pump 2
C.S. Pumps 1 and 2
RHR Pumps 1 and 2

APPENDIX B (cont)

ACTIONSCOMMENTS

- b. With the diesel generator 1-3 failed, do the following steps in the order given below in Appendix A (SI Injection/Recirculation Change Over Procedure).
- Steps: 2,3,4,5,7,8,9,10,11,12,13, 14,15,16,17,18,19,20,21,22,23,24, 27,28.
- c. Throttle HCV-638 and 637 to provide adequate suction for the SI and charging pump (approximately 20 psig above containment pressure while maintaining RHR pump motor current less than 57.5 amps).
- d. The cold leg recirculation flow path would be as follows.
- Containment spray pumps 1 and 2 from RWST to spray headers.
RHR pump No. 2 from containment sump to cold legs 3 and 4 and to SI pump No. 2.
- SI pump No. 2 from RHR No. 2 to cold legs 3 and 4.
- RHR pump No. 1 from containment sump to cold leg 1 and 2 and to No. 2 centrifugal charging pump.
- Centrifugal charging pump No. 2 from RHR Pump No. 2 to all cold legs via the BIT.

APPENDIX C

AUXILIARY FEED PUMP SUCTION SUPPLY FROM FIRE WATER TANK

The operator has 20 minutes to perform this operation after the 10 10 level alarm on the condensate storage tank and before the AFW pumps lose suction. This provides sufficient time; however, the operator must not delay and must carry out the valve line up in order as written.

If the AFW pumps are being supplied from the raw water reservoir and a seismic event occurs with resultant loss of AFW suction and auxiliary feedwater flow to the steam generators, the steam generators will boil dry in about 30 minutes. Under these conditions, it is especially important to expedite this procedure and reestablish AFW flow to the steam generators prior to the reactor losing its heat sink.

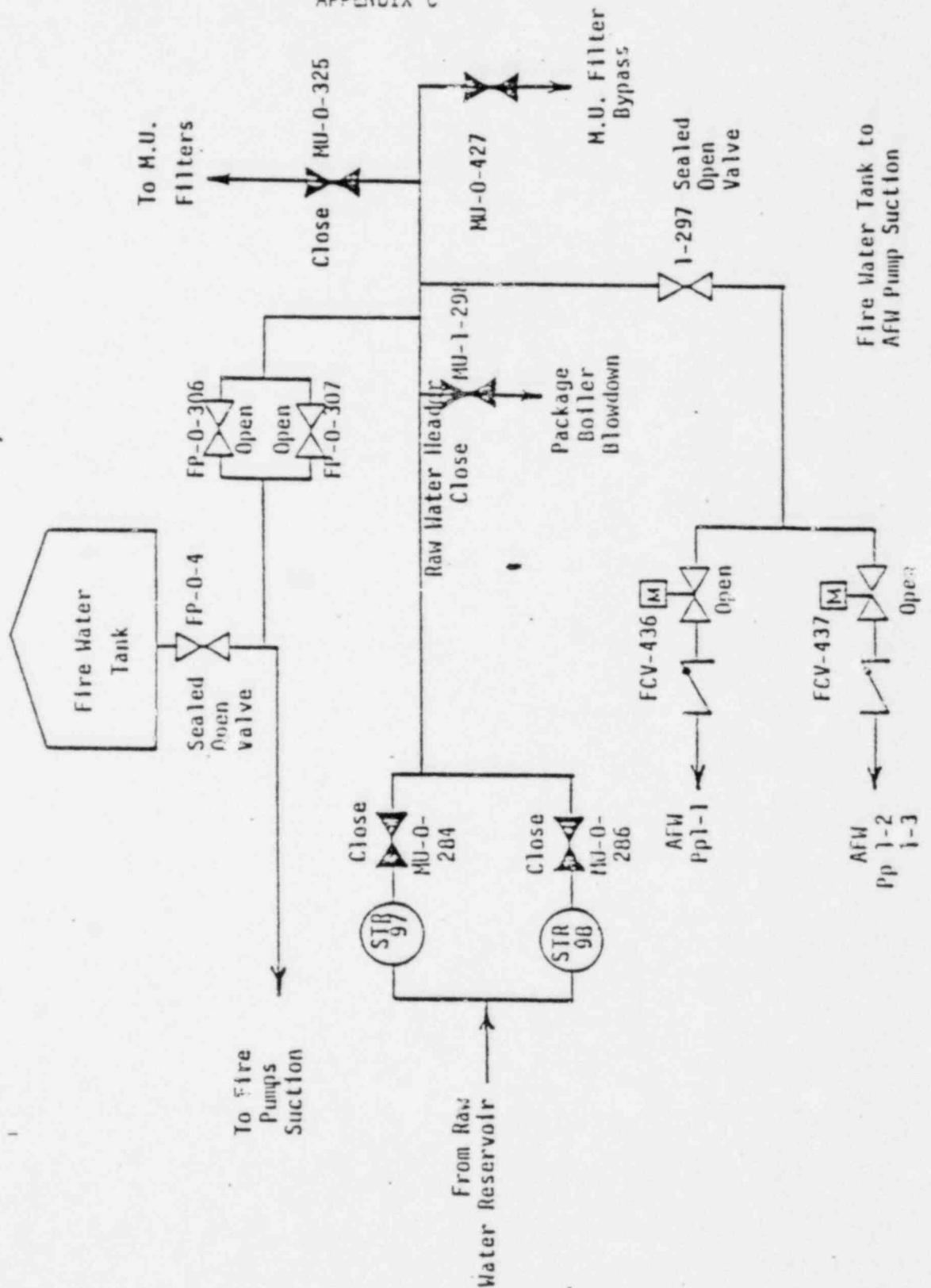
ACTIONSCOMMENTS

Using the attached drawing, proceed to supply the AFW pumps suction from the fire water tank.

1. Close or verify closed MU-0-284 and MU-0-286.
2. Close or check closed MU-1-298.
3. Close or check closed MU-0-325.
4. Close or check closed MU-0-427.
5. Open FP-0-306 and FP-0-307.
6. Notify the control room that the suction for the AFW pumps is now available from the fire water tank.
7. From the control room open FCV-436 and 437.
8. Proceed to the auxiliary feedwater pumps and vent the pump casings if required to remove air.

1. Closing these valves prevents losing fire water out a possible break in the reservoir supply line.

APPENDIX C



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APPENDIX D

RHR TRAIN/COMPONENT FAILURE
A. FAILURE IN RHR TRAIN NO. 2ACTIONSCOMMENTS

- | | |
|---|--|
| <p>1. If RHR pump No. 2 failed, containment sump to RHR valve 8982B or RHR pump No. 2 to SI suction valve 8804B failed to open proceed with steps a. to e. to provide charging and SI pump suction from RHR pump No. 1.</p> <p>a. Verify RHR pump No. 1 cross tie valves to SI pump suction 8807A or B open.</p> <p>b. Close or verify closed Train No. 2 to SI pump suction valve 8804B.</p> <p>c. Throttle HCV-638 to ensure adequate suction for the SI and centrifugal charging pumps (approximately 20 psig above containment pressure) while maintaining RHR pump motor current less than 57.5 amps.</p> <p>d. Return to the OP-2 procedure step that was left to perform Appendix A.</p> | <p>1. Monitor RWST level, when the level reaches the low alarm setpoint, trip all safeguards pumps taking suction from the tank.</p> |
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APPENDIX D

B. FAILURE IN RHR TRAIN NO. 1ACTIONSCOMMENTS

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|---|--|
| <p>1. If RHR pump No. 1 failed, containment sump to RHR valve 8982A or RHR pump No. 1 to charging pumps suction valve 8804A failed to open, proceed with steps a. to e. to provide charging and SI pump suction from RHR pump No. 2.</p> <p>a. Verify RHR pump No. 2 crosstie valves to SI pump suction 8807A or B open.</p> <p>b. Close or verify closed Train No. 1 to SI pump suction valve 8804A.</p> <p>c. Throttle HCV-637 to ensure adequate suction for the SI and centrifugal charging pumps (approximately 20 psig above containment pressure) while maintaining RHR pump motor current less than 57.5 amps.</p> <p>d. Return to the OP-2 procedure step that was left to perform Appendix A.</p> | <p>1. Monitor RWST level, when the level reaches the lo lo alarm setpoint, trip all safeguards pumps taking suction from the tank.</p> |
|---|--|

APPENDIX E

1. If the vital busses lose voltage prior to resetting the safety injection signal, the vital busses will automatically load the vital equipment given below. Verify the equipment has been loaded by observing breaker lights on the control board.
2. If the vital busses lose voltage after the safety injection signal has been reset, load or verify loaded the equipment given below onto the vital busses manually. Allow approximately 4 seconds between loading of each piece of equipment onto a given vital bus. Load or verify that the CFCU are running in low speed.

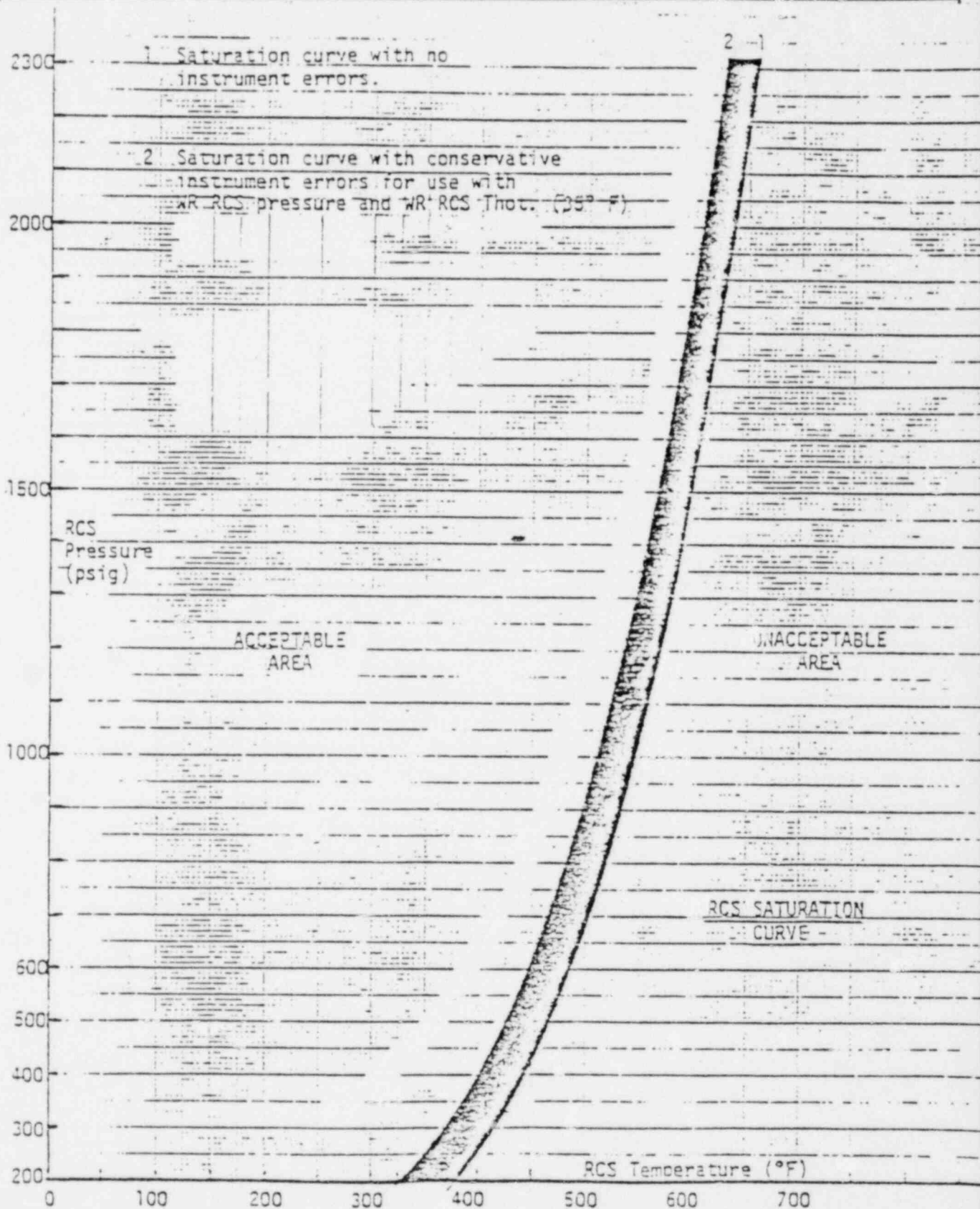
VITAL BUS F	VITAL BUS G	VITAL BUS H
D/G 1-3	D/G 1-2	D/G 1-1
MCC 1-F	MCC 1-G	MCC 1-H
CC Pp 1-1	CC Pp 1-2	SI Pp 1-2
SI Pp 1-1		
CFCU 1-2	RHR Pp 1-1	RHR Pp 1-2
CFCU 1-1	CFCU 1-3	CFCU 1-4
CCW Pp 1-1	CFCU 1-5	CCW Pp 1-3
ASW Pp 1-1	CCW Pp 1-2	AFW Pp 1-2
AFW Pp 1-1	ASW Pp 1-2	

3. Load the Containment Spray Pumps only if they were running prior to the blackout.

VITAL BUS G	VITAL BUS H
Cont Spray Pp 1-1	Cont Spray Pp 1-2

APPENDIX Z
EMERGENCY PROCEDURE NOTIFICATION
INSTRUCTIONS

1. When this emergency procedure has been activated and upon direction from the Shift Foreman proceed as follows.
 - a. Designate this event an Unusual Event. Notify Personnel as per Emergency Procedure G-2 (Establishment of On-Site Emergency Organization)
 - b. If a major steam line break is accompanied with primary to secondary leakage >10 gpm designate this event as an Alert. Notify those agencies given in Emergency Procedure G-3 (Notification of Off-Site Organization).
 - c. If the primary to secondary leakage progresses to >50 gpm with fuel damage evident, designate this event as a Site Area Emergency.
 - e. Within one hour notify the NRC Operations Center using the red phone in the Control Room. Gather sufficient information from all sources prior to calling so that the phone call is meaningful. Notify the NRC that your call is pursuant to 10 CFR Part 50.72., (Notification of Significant Events).



TITLE LOSS OF SECONDARY COOLANTAPPENDIX Z
EMERGENCY PROCEDURE NOTIFICATION
INSTRUCTIONS

1. When this emergency procedure has been activated and upon direction from the Shift Foreman, proceed as follows:
 - a. Designate this event an Unusual Event. Notify Personnel as per Emergency Procedure G-2 (Establishment of On-Site Emergency Organization) and the agencies given in Emergency Procedure G-3 (Notification of Off-Site Organization).
 - b. If a major steam line break is accompanied with primary to secondary leakage >10 gpm designate this event as an Alert. Implement Notification Procedures EP G-2 and G-3.
 - c. If the primary to secondary leakage progresses to >30 gpm with fuel damage evident, designate this event as a Site Area Emergency. Implement Notification Procedures EP G-2 and G-3.