SALEM GENERATING STATION	
OPERATIONS DEPARTMENT DOCUMENT APPROVAL COV	ER SHEET
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EMERGENCY INSTRUCTION I-4.0 SAFETY INJECTION INITIATION

1.0 PURPOSE

- 1.1 This instruction is provided to present the immediate automatic and manual actions required to be performed on the receipt of any Safety Injection Actuation, whether automatically or manually initiated.
- 1.2 This instruction contains the information required to direct the operator to the appropriate Emergency Instruction to cope with the existing plant conditions.

2.0 INITIAL CONDITIONS

2.1 Safety Injection has been initiated, either automatically or manually.

3.0 IMMEDIATE ACTIONS

- 3.1 Verify the following automatic actions have occurred.
 - 3.1.1 REACTOR TRIP by verifying all control rods are fully inserted by checking the individual rod position indications and rod bottom lights.
 - a. If any control rods do not indicate full insertion, initiate a manual reactor trip.

NOTE

The Rod Position indications & Rod Bottom lights may be erroneous due to an adverse containment environment.

- 3.1.2 ACCIDENT LOADING OF the SAFEGUARDS EQUIPMENT has taken place and the following equipment is running by observing the indicating lights on the status panel on 1RP4 or by observing the control bezels for each of the following:
 - a. Centrifugal Charging Pumps
 - b. Safety Injection Pumps
 - c. Residual Heat Removal Pumps
 - d. Auxiliary Feedwater Pumps (Motor Driven)
 - e. Service Water Pumps
 - f. Containment Fan Coil Units in slow speed.
 - g. Diesel Generators

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- 3.1.3 REACTOR COOLANT TEMPERATURE is decreasing to or being maintained at 547°F by either steam dump or atmosphere steam relief.
- 3.1.4 TURBINE TRIP by verifying unit trip light on the EH console and turbine speed decreasing.
 - a. If the turbine does not indicate a tripped condition, initiate a manual trip from the control console.
- 3.1.5 MAIN FEED PUMPS tripped by observing the indications on the Control Bezel.
 - a. If either pump does not indicate a tripped condition, initiate a manual trip from the control console.
- 3.1.6 FEEDWATER ISOLATION by observing the indicating lights on the Feedwater section of !RP4.
- 3.2 Verify Safety Injection Pump flow to the Cold Legs from the operating Safety Injection Pump(s) by observing the discharge flow meters on the control console.
- 3.3 When RCS pressure decreases to less than 1500 psig as read on the Wide Range Indicators on the control console, perform the following:
 - 3.3.1 STOP all Reactor Coolant Pumps.
 - 3.3.2 CLOSE 1CV139,1CV140 The Charging Pump Recirc Stop Valves.

NOTE

Monitor RCS pressure throughout this procedure. If RCS pressure should drop below the setpoint complete the actions required by 3.3.1 and 3.3.2.

- 3.4 Verify CONTAINMENT PHASE A ISOLATION has taken place by observing the indicating lights on the Status Panel 1RP4.
- 3.5 Announce over the Station PA System twice: UNIT 1 REACTOR TRIP, SAFETY INJECTION.

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4.0 SUBSEQUENT ACTIONS

COMMENTS

- 4.1 If a CO2 actuation occurs during Diesel Generator operation, perform the following:
 - 4.1.1 Immediately STOP the affected diesel to prevent overheating of the generator.
 - 4.1.2 Refer to the immediate action statement of the annunciator alarm response for location A-29 "FIRE PROTECTION CO2 DISCHARGE"

CAUTION

DO NOT REINITIATE Safety Injection

- 4.1.3 If restarting the diesel is necessary to supply minimum safeguards, then, MANUALLY START and LOAD the diesel.
- 4.2 Verify Safety Injection is in progress by checking each of the following. If any equipment or valve is not in the desired condition or position attempt to establish the desired condition at the individual bezel on the control console.

DO NOT ATTEMPT TO reset the Safety Injection or SEC in order to place equipment in desired condition. System design is such that sufficient redundancy is provided to overcome single failures.

4.2.1 Verify, utilizing console and/or 1RP4 status panel indications, that the loads listed on Table 1 have been loaded onto the vital busses.

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If no flow is indicated,

check open 1SJ4, 1SJ5,

1SJ12, 1SJ13

- 4.2.2 Verify Safety Injection flow to the Cold Legs through the Boron Injection Tank by observing Charging Pump Discharge Flow on the Safety Injection Bezel.
- 4.2.3 Check that the following values have opened by observing the Status Panel on 1RP4. If any value fails to open, attempt to manually open from the Control Console.

1SJ1 Charging Pump Suction from RWST

1SJ2 Charging Pump Suction from RWST

4.2.4 Check that the following values have closed by observing the Status Panel on 1RP4. If any value fails to close, attempt to close the value from the control console.

> 1SJ78 Recirc to Boric Acid Tank 1SJ79 Recirc to Boric Acid Tank 1SJ108 Recirc to Boron Injection Tank

- 1CV68 Charging System Isolation Valve
- 1CV69 Charging System Isolation Valve
- 1CV40 Volume Control Tank Discharge Valve
- 1CV41 Volume Control Tank Discharge Valve
- 1CV3 Orifice Isolation Valve (Letdown)
- 1CV4 Orifice Isolation Valve (Letdown)
- 1CV5 Orifice Isolation Valve (Letdown)
- 1CV7 CVCS Letdown Line
- 1CV116 Reactor Coolant Pump Seal Water Discharge 1CV284 Reactor Coolant Pump

Seal Water Discharge

1CV40 & 1CV41 will not close unless 1SJ1 or 1SJ2 is full open.

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11SW20	Turbine Generator	Area
	Supply Valve	
13SW20	Turbine Generator	Area

Supply Valve 1SW26 Turbine Generator Area Isolation Valve

- 4.3 Verify Auxiliary Feedwater flow is established to at least two Steam Generators by checking the Auxiliary Feedwater Flow indicators on the control console.
 - 4.3.1 If flow has not been established, proceed as follows:
 - a. Check the discharge pressure on the Motor Driven Auxiliary Feedwater Pumps (11,12) which are running. It should indicate greater than 1350psi.
 - b. If pressure is low(less than 1350psi) depress the PRESS OVERRIDE pushbutton on the console bezel for each Auxiliary Feedwater Pump.

This will remove the pump runout protection interlock on the AF21 valves and allow them to open to their preset demand regardless of discharge pressure.

c. If pressure is greater than 1350psi check the valve demand set at approximately 95% for 11-14 AF21 on the console bezel. Also, depress the PRESS OVERRIDE pushbutton on the console bezel for each Auxiliary Feedwater Pump.

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d. Start, if not already running, No. 13 Auxiliary Feedwater Pump and verify open 11-14 AF11.

4.4 Verify that Phase "A" Containment Isolation has taken place by checking that the valves listed in Table II are closed by observing the Status Panel on 1RP4. Should a valve fail to close, attempt to close it from the control console.

4.5 Verify that Feedwater Isolation has taken place due to the Safety Injection.

> 4.5.1 Check that the following valves have closed by observing the Status Panel on 1RP4. If any valve has failed to close, attempt to close it from the control console.

> > 11BF13 Feedwater Inlet Stop Valve 11BF19 Feedwater Control Valve 11BF40 Feedwater Bypass Valve Feedwater Inlet Stop Valve 12BF13 12BF19 Feedwater Control Valve 12BF40 Feedwater Bypass Valve Feedwater Inlet Stop Valve 13BF13 13BF19 Feedwater Control Valve Feedwater Bypass Valve 13BF40 Feedwater Inlet Stop Valve 14BF13 14BF19 Feedwater Control Valve 14BF40 Feedwater Bypass Valve

4.6 If the Reactor Coolant Pumps have been tripped, insure the Steam Dump Pressure Controller is set to 1005 PSIG and transfer the Steam Dump to Pressure Control. Tavg is not a reliable indication with no RCP's running. Wide Range TH and TC are reliable for RCS temperature.

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4.7 Verify that the 4160V Group Busses have transferred from the No. 1 Auxiliary Power Transormer to No. 11 and No. 12 Station Power Transformers.

> 4.7.1 Check that the following 4160V Breakers have opened and acknowledge them on the appropriate control console bezel.

> > 1BGGD 1BFGD 1AEGD 1AHGD

- 4.7.2 Check that the following 4160V Breakers have closed and acknowledge them on the appropriate control console.
 - 12GSD 12FSD 11ESD 11HSD
- 4.8 If the RWST level is decreasing rapidly (greater than approximately 2 ft/min.), proceed directly to EI I-4.4, "Loss of Coolant."

A large LOCA is the only accident which will cause the RWST to decrease rapidly.

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4.9 Verify the following fans have stopped by observing the indications as noted. If any fans are still running, attempt to stop them manually.

> No. 11 & 12 Iodine Removal. (Control Console) No. 11, 12, 13, 14 Nozzle Support, (Control Console) No. 11 & 12 Reactor Shield, (Control Console) No. 11, 12,13, 14 Control Rod Drive (Control Console) No. 11 & 12 RHR Pump Room Coolers, (1RP2) Charging Pump No. 11 & 12 Room Coolers, (1RP2) No. 11 & 12 Containment Spray Pump Room Coolers, (RP2)

- 4.10 Verify Control Area Air Conditioning has shifted to the ACCIDENT - INSIDE AIR mode of operation and the following actions have occurred by observing the Status Panel on RP2. If any actions do not occur, manually initiate them IAW II-17.3.2, "Control Room Ventilation Operation."
 - 4.10.1 No. 11, 12, 13 Chillers are running.
 - 4.10.2 No. 11 & 12 Chilled Water Pumps are running.
 - 4.10.3 No. 11, 12, 13 Control Area Supply Fans are running.
 - 4.10.4 No. 11 & 12 Emergency Control Area Supply Fans are running.
 - 4.10.5 Battery Exhaust Fan has stopped.

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- 4.10.6 Control Valves 1CH30 and 1CH151 close to isolate the Administration Building.
- 4.10.7 Control Area Dampers positioned as follows:

CAA1	-	CLOSED	CAA18	-	OPEN
CAA2	-	CLOSED	CAA19	-	CLOSED
CAA3	-	CLOSED	CAA20	-	CLOSED
CAA4	-	CLOSED	CAA31	-	CLOSED
CAA5	-	OPEN	CAA32	-	CLOSED
CAA14	-	CLOSED	CAA33	-	CLOSED
CAA17	-	OPEN	-		

5.0 IDENTIFICATION OF FOLLOW UP ACTIONS

- 5.1 Perform the following Notifications of the Reactor Trip/Safety Injection.
 - 5.1.1 Notification of the Reactor Trip/SI to the following:
 - a. OPERATIONS MANAGER and/or
 - b. OPERATING ENGINEER and
 - c. NRC
 - and d. other appropriate people IAW Emergency Plann Procedure EP-I-O.
 - 5.1.2 Refer to Emergency Plan Procedure EP-I-O for the appropriate accident classification.

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5.2 Verify the following are closed or isolated at their individual control bezels.

- 5.2.1 Pressurizer Spray Valves (PS-1 & 3)
 - a. If PS1 or PS3 is open and will not close, Trip the Reactor Coolant Pump in the associated loop.

1PS1 - Trip 11 RCP 1PS3 - Trip 13 RCP

- 5.2.2 Pressurizer Power Operated Relief Valves (PR1 & 2)
- 5.3 If RCS pressure has stabilized after the initial decrease which initiated Safety Injection and Containment Isolation, the problem may be in an area or system which has been subsequently isolated. Investigate the following:
 - 5.3.1 Auxiliary Building for:
 - a. Increases in radiation
 - b. Unexplained accumulations of water.
 - 5.3.2 Pressurizer Auxiliary Spray Valve (1CV75). Ensure it is closed.
- 5.4 Utilize the Matrix on the next page to determine which subsequent Emergency Instruction to follow.

Containment Pressure may spike due to adverse environment but should return to near actual pressure.

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Utilize Redundant indications where available to ensure proper diagnosis.

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	· · · ·	· · · ·			
1A DIESEL GENERATOR	1B DIESEL GENERATOR	1C DIESEL GENERATOR			
240/480V Breaker	240/480V Breaker	240/480V Breaker			
11 SI Pump	11 Charging Pump	12 Charging Pump			
11 RHR Pump	12 RHR Pump	12 SI Pump			
15 SW Pump OR 16 SW Pump	14 SW Pump OR 13 SW Pump	11 SW Pump OR 12 SW Pump			
11 Containment Fan (Low Speed)	12 Containment Fan (Low Speed)	13 Containment Fan (Low Speed)			
11 Auxiliary Feed Pump	14 Containment Fan (Low Speed)	15 Containment Fan (Low Speed)			
11 Auxiliary Building Exhaust Fan	12 Auxiliary Feed Pump	Emergency Air Compressor			
11 Chiller	12 Auxiliary Building Supply Vent Fan	11 Auxiliary Building Supply Vent Fan			
11 SWGR Room Supply Fan	12 Auxiliary Building Exhaust Fan	13 Auxiliary Building Exhaust Fan			
· · ·	12 Chiller	13 Chiller			
	12 SWGR Room Supply Fan	13 SWGR Room Supply			
NOTE 1 This sequence is Actuation with o condition will t first stripping sequenced onto t with a Safety In one 4kV Vital Bu	This sequence is initiated on any Safety Injection Actuation with or without a Blackout, only in a blackout condition will the Diesel Generator Breakers close after first stripping the bus and the loads will then be sequenced onto the bus. This sequence is also initiated with a Safety Injection coincident with undervoltage on one 4kV Vital Bus.				

TABLE I "BLACKOUT WITH SAFETY INJECTION" LOADING SEQUENCE

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will close.

NOTE 2

Only the lead Service Water Pump will start, however, if the lead pump fails to start the backup pump breaker

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TABLE II PHASE "A" ISOLATION

1. Waste Disposal System

1WL12 RCDT Pump Discharge 1WL13 RCDT Pump Discharge 1WL16 Containment Sump Pump Discharge 1WL17 Containment Sump Pump Discharge 1WL96 Gas Analyzer From RCDT 1WL97 Gas Analyzer From RCDT 1WL98 RCDT Vent 1WL99 RCDT Vent 1WL98 N2 Supply to RCDT

2. Sampling System

1SS27 Accumulator Sample 1SS33 Hot Leg Sample 1SS49 Sample from PZR Water Space 1SS64 Sample from PZR Steam Space 1SS103 Accumulator Sample 1SS104 Hot Leg Sample 1SS107 Sample from PZR Water Space 1SS110 Sample from PZR Steam Space 11SS94 Sample from No. 11 Stm Gen Blowdown 12SS94 Sample from No. 12 Stm Gen Blowdown 13SS94 Sample from No. 13 Stm Gen Blowdown 14SS94 Sample from No. 14 Stm Gen Blowdown

3. Component Cooling

1CC113 Excess Letdown Heat Exchanger Cooling Water Outlet 1CC215 Excess Letdown Heat Exchanger Cooling Water Inlet

4. Steam Generator Drains and Blowdown

11GB4 Steam Gen Outlet No. 11 12GB4 Steam Gen Outlet No. 12 13GB4 Steam Gen Outlet No. 13 14GB4 Steam Gen Outlet No. 14

5. Pressurizer Relief Tank

1WR80 Primary Water Supply to PRT 1PR17 Gas Analyzer From PRT 1PR18 Gas Analyzer From PRT 1NT25 N2 Supply to PRT

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6. Accumulators 1NT32 Accumulator N₂ Supply Containment Ventilation 7. 1VC1 Purge Supply 1VC2 Purge Supply 1VC3 Purge Exhaust 1VC4 Purge Exhaust 1VC5 Cont Press Vac Relief Isolation Valve 1VC6 Cont Press Vac Relief Isolation Valve 1VC7 Containment Radiation Sample Outlet 1VC8 Containment Radiation Sample Outlet 1VC11 Containment Radiation Sample Inlet 1VC12 Containment Radiation Sample Inlet Demineralized Water 8. 1DR29 DM Water to Flushing Connections 9. Fire Protection 1FP147 Fire Protection Water Supply 10 Safety Injection 1SJ123 Accum Test Stop Valve 1SJ60 Accum Disch Test Stop 1SJ53 SJ HDR Test Stop Valve Control Air 11. 11CA330 A HDR Isolation Valve 12CA330 B HDR Isolation Valve 12. Containment Ventilation - The following sample valves receive no automatic isolation signal, however, they should be verified closed. 1VC9 Containment Radiation Sample Outlet Backup 1VC10 Containment Radiation Sample Outlet Backup 1VC13 Containment Radiation Sample Inlet Backup 1VC14 Containment Radiation Sample Inlet Backup

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