VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION
UNIT NO. 2

LOSS OF REACTOR COOLANT ACCIDENT

REFERENCES:

1. FSAR Chapters 6 and 15.
2. 12050-LSK 28-5
3. 12050-FM-95B, C
4. 12050-FM-96A, B
5. 12050-ESK 6K, 6L, 6CP, 6CQ
6. 12050-FE - 1G, 1Q, 1R
7. FSAR Comment 6.132
8. North Anna Unit #2 Facility License
9. I.E. Bulletin #79-06A, 79-06C

REV. 9 PAGE: Entire DATE: 05-22-80 APPROVAL: MRC

RECOMMEND APPROVAL: [illegible]

APPROVED BY: MR Cartwright
CHAIRMAN STATION NUCLEAR SAFETY
AND OPERATING COMMITTEE

DATE: 05-22-80

SAFETY RELATED

8006050 333

3.0 Immediate Operator Actions

3.1 2-EP-1 Immediate Actions have been completed.

NOTE: If any required Automatic Action has not occurred, it shall be manually initiated.

3.2 Manually initiate Safety Injection.

3.2.1 Verify that the emergency busses (H and J) are energized and both emergency diesel generators are running.

3.2.2 Verify Phase A isolation.

3.2.3 Verify Feedwater isolation.

3.2.4 Verify that the Auxiliary Feedwater pumps (2-FW-P-2, 2-FW-P-3A and 3B) have started and are flowing (FI-FW-200A, B & C).

3.2.5 Verify high head and low head Safety Injection pumps are running and cold leg Injection flow is indicated on FI-2961, 2962 and 2963.

3.3 Verify Main Steam Isolation if:

3.3.1 Containment pressure exceeds the intermediate high high setpoint of 17.8 psia. or,

3.3.2 Safety Injection was initiated by high steam flow-low Tave (543°) or high steam flow-low steam pressure. (600#)

3.4 Verify containment high-high initiation if containment pressure exceeds 25 psia.

3.4.1 Verify Quench Spray pumps start.

3.4.2 Verify Phase "B" isolation.

3.5 Emergency Director to initiate EPIP-1.

Initials

4.0 Long Term Operator Actions

NOTE: DO NOT UNDER ANY CIRCUMSTANCES CLOSE THE COOLANT LOOP ISOLATION VALVES.

NOTE: The pressurizer water level indication should always be used in conjunction with other specified reactor coolant system indications to evaluate system conditions and to initiate manual operator actions.

NOTE: If the Reactor Coolant System pressure decreases in an uncontrolled manner to < 1485 PSIG, secure all reactor coolant pumps.

NOTE: Initiate Attachment 2 to verify natural circulation upon tripping reactor coolant pumps.

NOTE: Complete step 4.5 when the criteria for securing safety injection has been met.

CAUTION: Do not secure seal injection.

CAUTION: If component cooling water to the reactor coolant pumps is isolated on a containment pressure signal, all reactor coolant pumps should be stopped within 5 minutes because of loss of motor bearing cooling.

CAUTION: During a safety injection when a emergency bus is being carried by its emergency diesel generator, the loading must be ≦ 3000kw. The emergency bus powered pressurizer heaters shall not be re-energized until the load is < 2730 kw and actual pressurizer level is greater than 10%. Equipment which may be secured to meet this requirement are:

1. Containment Air Recirc Fan(s)
2. Rod Drive Cooling Fan(s)
3. Service Water Screen Wash Pump
4. Standby Primary Grade Water Pump

Initials

4.0 Long Term Operator Actions (cont.)

_____ 4.1 Verify SI (ΦA) and/or (ΦB) isolation by initiating Attachment 3.

_____ 4.2 Verify that RWST level is decreasing and containment recirculation sump level is increasing. If proper level changes are not evident, re-evaluation of the incident is required.

_____ 4.3 Verify three (3) auxiliary feedwater pumps, 2-FW-P-2, 2-FW-P-3A and 3B are running and that feedwater flow is indicated to the appropriate steam generators.

NOTE: If any of the above pumps are not running or it is determined that proper flow is not being maintained, attempt to manually start the pump and/or refer to 2-AP-22.

Throttle flow to each Steam Generator to maintain no-load level (33%). Monitor auxiliary feedwater pump suction pressures to verify > 4 psig. Maintain 2-CN-TK-1 (emergency condensate storage tank) level above the lo-lo level alarm point (> 9%) by filling from 2-CN-TK-2 (condensate storage tank) per 2-OP-31.2

_____ 4.4 Close pressurizer power operated relief valves. Close the power operated relief valve isolation valves only if a power operated relief valve cannot be closed.

4.5 Safety Injection may be terminated if all of the following criteria are satisfied.

_____ _____
Yes No

1. Reactor Coolant pressure is > 2000 psig and increasing.

Initials

4.0 Long Term Operator Actions (cont.)

____ Yes ____ No

2. Pressurizer water level is > 50% span.

____ Yes ____ No

3. At least one steam generator is operable with level in the narrow range or at least 690 gpm is being injected into the non faulted steam generators.

____ Yes ____ No

4. All Th and Tc are at least 50°F below the saturation temperature for the existing RCS pressure.

____ Yes ____ No

5. SRO/STA are in agreement with the incident diagnosis.

NOTE: If the reactor coolant pressure drops below the pressurizer pressure setpoint for Safety Injection or pressurizer level drops below 20% of span or

If 50°F indicated subcooling cannot be established or maintained, then manually reinitiate safety injection and request that the SRO/STA re-evaluate the incident.

6. Secure Safety Injection and establish normal charging and letdown as per Attachment 1.

NOTE: If all of the listed criteria cannot be satisfied, proceed to Step 4.6 and continue to cooldown the RCS. If all of the listed criteria is satisfied, continue with this step.

NOTE: After resetting the Safety Injection signal, automatic reinitiation will not occur since the reactor trip breakers are not reset.

____ 4.6 Line up the Post Accident Thermal Hydrogen Recombiner in preparation for utilization as per 1-OP-63.1.

4.7 Secure waste gas release from the site:

____ 4.7.1 Close WGDT release valve FCV-GW-101.

____ 4.7.2 Inform the other units to secure containment purge and hogging operations.

Initials

4.0 Long Term Operator Actions (cont.)

_____ 4.8 If the reactor coolant pumps have been secured due to an uncontrolled depressurization (< 1485 psig), it is NOT permissible to restart a reactor coolant pump until the criteria for securing safety injection has been met and plant conditions have been evaluated for starting a reactor coolant pump.

_____ 4.9 If the reactor coolant pumps have been secured, verify natural circulation as per Attachment 2.

_____ 4.10 When the containment reaches a sub-atmospheric condition:

CAUTION: Place the rad monitoring pumps 2-SW-P-5, 6, 7 and 8 to the on position and rod drive cooling fans 2-HV-37 A B C D E and F to the off position. This will prevent the pumps from stopping and fans starting when the CDA Signal is reset.

4.8.1 Reset containment spray actuation with the "RESET" switches.

NOTE: Resetting of the "CONTAINMENT SPRAY ACTUATION" does not automatically stop safeguards equipment except the equipment in the caution above after stop safeguards equipment. Stopping of the safeguards equipment is controlled by the subsequent steps of this procedure or as emergency conditions dictate.

NOTE: Subsequent to resetting the spray actuation signal should a loss of offsite power occur, manual restart of spray, and casing cooling pumps will be required.

_____ 4.11 If RCS pressure has decreased to < 600 psig, verify accumulator injection. (LI-2920, 2924, 2928)

_____ 4.12 If RCS pressure has decreased to <175 psig, verify LHSI flow (FI-2945, 2946).

_____ 4.13 If there is high activity in the service water discharge from a recirc. spray heat exchanger, close the affected heat exchanger service water inlet and outlet valves (keylock switches in the

Initials

4.0 Long Term Operator Actions (cont.)

service water logic panel must be in defeat), secure the associated radiation monitoring sample pump, and secure the associated recirc. spray pump as indicated below:

HEAT EXCHANGER	RS PUMP	RAD. PUMP	SW VALVES	SW CABINET
2-RS-E-1A	2-RS-P-1A	2-SW-P-5	MOV-SW-203A	2-EP-CB-28H
			MOV-SW-204A	Train A-H Bus
2-RS-E-1B	2-RS-P-1B	2-SW-P-6	MOV-SW-203B	2-EP-CB-28J
			MOV-SW-204B	Train B-J Bus
2-RS-E-1C	2-RS-P-2B	2-SW-P-7	MOV-SW-203C	2-EP-CB-28J
			MOV-SW-204C	Train B-J Bus
2-RS-E-1D	2-RS-P-2A	2-SW-P-8	MOV-SW-203D	2-EP-CB-28H
			MOV-SW-204D	Train A-H Bus

NOTE: Two heat exchangers are needed intially and one heat exchanger is required for long-term cooling after the first 24 hrs.

_____ 4.14 Continue to monitor auxiliary feedwater flow and make-up to 2-CN-TK-1 (emergency condensate storage tank) as per 2-OP-31.2.

4.15 The emergency diesel generators should not be operated at idle speed or minimum load for extended periods of time. Verify with the System Operator that the VEPCO power system is stable, then return the station service electrical systems to normal as per 2-AP-10 and return the emergency busses and emergency diesel generators to normal as per 2-OP-6.

NOTE: In the event of a simultaneous Loss of Coolant Accident and a Loss of Station Power while only one (1) Emergency Diesel is supply power to its respective emergency bus (other emergency diesel being inoperable), DO NOT shut down the last running diesel under any circumstances until ordered by administrative authority after accident has been terminated.

Initials

4.0 Long Term Operator Actions (cont.)

4.16 Terminate the cold leg injection mode and initiate the cold leg recirculation mode when the RWST level decreases to 28.1% as follows:

_____ 4.16.1 Verify that two charging pumps are running.

_____ 4.16.2 Close MOV-2370, RCP seal water injection.

_____ 4.16.3 Open the low head safety injection pump discharge valves to the charging pump suctions (MOV-2863A, MOV-2863B).

_____ 4.16.4 Close the low head safety injection pump miniflow recirc. valves to the RWST (MOV-2885A, MOV-2885C, MOV-2885B, MOV-2885D).

_____ 4.16.5 Open the LHSI suction valves to the containment sump MOV-2860A, 2860B.

_____ 4.16.6 Close the LHSI suction valves from the RWST MOV-2862A, 2862B.

NOTE: Upon receipt of the "RWST in bypass mode" alarm at 25.5%, the above actions in 4.16.3 through 4.16.6 will occur automatically.

_____ 4.16.7 Close the charging pump suction valves from the RWST MOV-2115B, MOV-2115D.

_____ 4.17 Periodically monitor the auxiliary building area radiation monitors for detection of leakage from the ECCS during recirculation. If significant leakage is identified; attempt to isolate the leakage. Recirculation flow must be maintained to the RCS at all times.

Initials

4.0 Long Term Operator Actions (cont.)

4.18 Establish high head flow-path redundancy for long term passive failure protection as follows:

_____ 4.18.1 Open the alternate cold leg recirculation path valve MOV-2836.

_____ 4.18.2 Align one charging pump to discharge only through the boron injection tank by closing its associated valve indicated below:

2-CH-P-1A	MOV-2287A
2-CH-P-1B	MOV-2287B
2-CH-P-1C	MOV-2287C

_____ 4.18.3 Align the other operating charging pump to discharge only through the alternate path by closing its associated valve indicated below:

2-CH-P-1A	MOV-2286A
2-CH-P-1B	MOV-2286B
2-CH-P-1C	MOV-2286C

_____ 4.18.4 Isolate the flow path around the discharge of the third (non-operating) charging pump by closing its associated discharge valves indicated below:

2-CH-P-1A	MOV-2286A, 2287A
2-CH-P-1B	MOV-2286B, 2287B
2-CH-P-1C	MOV-2286C, 2287C

_____ 4.19 Secure the Quench Spray pumps when it is proven that the pumps are not pumping anymore water by completing the following actions.

Initials

4.0 Long Term Operator Actions (cont.)

4.19.1 Stop the Quench Spray Pumps:

_____ 2-QS-P-1A

_____ 2-QS-P-1B

4.19.2 Close the Quench Spray Pumps Suction and Discharge Valves:

_____ MOV-QS-200A

_____ MOV-QS-201A

_____ MOV-QS-200B

_____ MOV-QS-201B

_____ 4.20 Monitor performance of the LHSI and the Outside Recirc. Spray pumps by initiating the POST LOCA LOG (Attachment 4). Record data at approximately 2 hour intervals or as directed by the Shift Supervisor/Emergency Director. Pay particular attention to trends developing which would indicate LHSI pumps performance degradation.

_____ 4.21 Place the Control Room Emergency Vent System in service approximately 1 hour after safety injection initiation as per 1-OP-21.7.

4.22 When casing cooling tank level decreases to 2.5%:

_____ 4.22.1 Verify MOV-RS-200A and B closes.

_____ 4.22.2 Stop casing cooling pumps 2-RS-P-3A and 3B.

4.23 Approximately 18 hrs. after the LOCA, terminate the cold leg recirculation mode and initiate the hot leg recirculation mode as follows:

_____ 4.23.1 Close the LHSI discharge valves to the cold legs, MOV-2864A, 2864C, 2890B, 2890D.

_____ 4.23.2 Open the LHSI discharge valves to the hot legs, MOV-2890A, 2890B.

Initials

4.0 Long Term Operator Actions (cont.)

_____ 4.23.3 Stop the charging pump that is operating through the boron injection tank.

_____ 4.23v4 Close the boron injection tank isolation valves, MOV-2867A, 2867C, 2867B, 2867D.

_____ 4.23.5 Open MOV-2869B.

_____ 4.23.6 Restart the charging pump stopped above. Flow rate will be indicated on FI-2943, FI-2960, FI-2933, and FI-2932.

_____ 4.23.7 Stop the charging pump that is discharging through the alternate path.

_____ 4.23.8 Close the alternate cold leg S.I. valve, MOV-2836.

_____ 4.23.9 Open the charging pump discharge header S.I. stop valve, MOV-2869A.

_____ 4.23.10 Restart the charging pump stopped in step 4.23.7.

4.24 Between 24 and 48 hours after the LOCA has occurred, verify that redundant operating equipment is operable and then:

_____ 4.24.1 Stop one inside recirc spray pump (2-RS-P-1A or 1B)

_____ 4.24.2 Stop one outside recirc spray pump (2-RS-P-2A, or 2B)

_____ 4.24.3 Stop all but one charging pump (2-CH-P-1A, or 1B, or 1C)

_____ 4.24.4 Stop the low head safety injection pump that is powered by the same bus as the charging pump stopped above (step 4.23.3)

CHARGING PUMP STOPPED	LHSI PUMP STOPPED
2-CH-P-1A or 2-CH-P-1C (H BUS)	2-SI-P-1A
2-CH-P-1B or 2-CH-P-1C (J BUS)	2-SI-P-1B

Initials

4.0 Long Term Operator Actions (cont.)

If after going to single train operation following the LOCA one LHSI cannot supply sufficient flow per Attachment 5, restart the other LHSI pump secured above.

_____ 4.24.5 Close redundant charging pump suction valves:

Pump	Verify Open	Then Close
2-CH-P-1A	MOV-2267B	MOV-2267A
2-CH-P-1B	MOV-2269A	MOV-2269B
2-CH-P-1C (H Bus)	MOV-2270B	MOV-2270A
2-CH-P-1C (J Bus)	MOV-2270A	MOV-2270B

4.25 Approximately 27 hrs. after the initiation of hot leg recirculation mode, switch over to cold leg recirculation mode as follows:

_____ 4.25.1 Close the LHSI discharge valves to the hot legs, MOV-2890A, 2890B.

_____ 4.25.2 Open the LHSI discharge valves to the cold legs, MOV-2864A, 2864C, 2890B, 2890D.

_____ 4.25.3 Stop the operating charging pump.

_____ 4.25.4 Close MOV-2869B.

_____ 4.25.5 Open the boron injection tank isolation valves, MOV-2867A, 2867C, 2867B, 2867D.

_____ 4.25.6 Close MOV-2869A.

_____ 4.25.7 Open MOV-2836.

_____ 4.25.8 Restart the charging pump stopped in step 4.25.3. Flow rate will be indicated on FI-2943, FI-2961, FI-2962 and FI-2963.

Initials

4.0 Long Term Operator Actions (cont.)

4.26 Approximately 27½ hours after initiation of cold leg recirculation, switch over to the hot leg recirculation modes as follows:

_____ 4.26.1 Close the LHSI discharge valves to the cold legs, MOV-2864A, 2890C, 2864B, 2890D.

_____ 4.26.2 Open the LHSI discharge valves to the hot legs, MOV-2890A, 2890B.

_____ 4.26.3 Stop the operating charging pump.

_____ 4.26.4 Close the boron injection tank isolation valves, MOV-2867A, 2867C, 2867B, 2867D.

_____ 4.26.5 Open MOV-2869B.

_____ 4.26.6 Close the alternate cold leg S.I. valve, MOV-2836.

_____ 4.26.7 Open MOV-2869A.

_____ 4.26.8 Restart the charging pump stopped in step 4.26.3. Flow rate will be indicated on FI-2943, 2960, 2933, and 2932.

_____ 4.27 At intervals not to exceed 27½ hours alternate between hot and cold leg recirculation flow by repeating section 4.25 and 4.26 as applicable.

4.28 Continue RCS cooldown and depressurization as per 1-OP-3 and/or based on further administrative decisions.

NOTE: If the cooldown is by natural circulation, continue to monitor and verify natural circulation as per attachment 2.

CAUTION: All parameter changes shall be performed slowly with extreme caution during cooldown on natural circulation.

Completed By: _____

Date: _____

Initials

Securing Safety Injection

_____ 1. Verify or reset safety injection train A and B by use of the control board reset pushbuttons.

_____ 2. Secure lowhead safety injection pumps (2-SI-P-1A and 1B) and Place the Control Switches to "Auto After Stop".

_____ 3. Open MOV-2289A charging line isol. on FCV-2122.

_____ 4. Secure the second operating charging pump and place its control switch to "Auto After Stop".

_____ 5. Shift FCV-2122 (charging flow controller) to manual and run it closed.

_____ 6. Shift PCV-2145 low press letdown pressure controller to manual and set to ~ 50% open

_____ 7. Open TV-2204 letdown line isolation trip valve.

_____ 8. Open MOV-2380 and MOV-2381 seal water return isolations.

_____ 9. Open LCV-2460A and 2460B letdown isolation valves from "A" loop.

_____ 10. Verify blender set for cold shutdown concentration and in auto make up mode.

_____ 11. Verify HCV-2310 open.

_____ 12. Verify HCV-2311 (aux. spray) closed.

_____ 13. Open 2289B (charging line isolation on FCV-2122).

14. Open charging pump recirc. valves.

_____ MOV-2275A 2-CH-P-1A

_____ MOV-2275B 2-CH-P-1B

_____ MOV-2275C 2-CH-P-1C

_____ MOV-2373 Common Recirc

15. Shift charging pumps suction from RWST to VCT as follows:

_____ 15.1 Verify VCT level > 20%.

_____ 15.2 Open MOV-2115C and 2115E.

_____ 15.3 When MOV-2115C and 2115E are full open verify MOV-2115B and 2115D go closed.

Initials

Securing Safety Injection (cont.)

_____ 16. Open FCV-2122 to ~ 20% open slowly.

17. Isolate flow thru Unit 1 boron injection tank by closing the following:

_____	MOV-2867A	BIT inlet
_____	MOV-2867C	BIT inlet
_____	MOV-2867B	BIT outlet
_____	MOV-2867D	BIT outlet

_____ 18. Open HCV-2200A (45 gpm orifice isolation).

_____ 19. Control PCV-2145 in manual to maintain 450-550 psig letdown line pressure until letdown line temperature decreases to normal.

_____ 20. Slowly adjust letdown line pressure to ~ 300 psig then shift PCV-2145 to auto.

NOTE: Monitor letdown radiation readings, reisolate letdown if reading exceeds 1000 times original. (could indicate excessive fuel failure)

_____ 21. Control FCV-2122 to maintain ~ 50% pressurizer level. 60 GPM orifice isolation valves 2200B and or 2200C may be required to be open to maintain level.

Natural Circulation Verification

Initials

CAUTION: During the conduct of this instruction, the RWST level should be monitored for switchover to cold leg recirculation, if required.

CAUTION: If the high range readings from the core exit thermocouples are not available, a condition of inadequate core cooling exists when: the hot leg RTD's are pegged high or five or more incore thermocouples are off-scale above 700°F and SI flow is not being delivered to the RCS and AFW is not being delivered to the intact steam generators.

CAUTION: If during the verification of natural circulation it is determined that the core is not being adequately cooled, proceed to Step 10.0.

CAUTION: Trip the pressurizer heaters, containment Air Recirc. Fan(s) and the Rod Drive Cooling Fan(s) to prevent overloading the Emergency Diesel Generators in the event that a SI occurs anytime during a balckout.

NOTE: Only one bank of backup heaters maybe required to maintain pressurizer pressure during natural circulation; there-fore load reduction will only be required on the diesel which will supply the heaters to be utilized.

NOTE: The pressurizer heaters are required to be in service within 1 hr. of entry into natural circulation.

1.0 All operable steam generators shall be maintained in the narrow range level indication range (tubes covered) by manual control of auxiliary feed flows (prefered ~ 33% level).

_____ 1.1 Verify steam generators operable by (√) check.

_____ "A" S/G _____ "B" S/G _____ "C" S/G

2.0 The ΔT (wide range Th - wide range Tc) for reactor coolant loops with operable steam generators should be between 25% and 80% of full power values (15°F to 50°F) as determined from TR-2413 (W.R. Th) and TR-2410 (W.R. Tc).

_____ 2.1 "A" Loop

W.R. Th (T-2413) - W.R. Tc (T-2410) = ΔT
_____°F - _____°F = °F

_____ 2.2 "B" Loop

W.R. Th (T-2423) - W.R. Tc (T-2420) = ΔT
_____°F - _____°F = °F

Natural Circulation Verification (cont.)

Initials

_____ 2.3 "C" Loop
W.R. Th (T-2433) - W.R. Tc (T-2430) = ΔT
_____°F - _____°F = °F

_____ 3.0 Verify that the wide range Th indications as observed on TR-2413 are stable or decreasing.

_____ 4.0 Pressurizer pressure shall be maintained high enough to assure ≧ 50°F subcooling from the highest wide range operable Th indication from TR-2413, verification shall be made from the posted saturation graph.

5.0 Pressurizer level shall be maintained in manual level control.

CAUTION: high energy break in containment can cause up to 40% indication error in pressurizer level. To secure safety injection under this condition pressurizer level must be ≧ 50% and maintained there.

_____ 5.1 LI-2459 A _____%

_____ 5.2 LI-2460 _____%

_____ 5.3 LI-2461 _____%

6.0 Record the incore thermocouple temperatures as required below

	SWITCH POSITION #	CORE LOCATION	TEMP. °F
_____	10	J10	_____
_____	17	E10	_____
_____	18	F9	_____
_____	20	D5	_____
_____	24	E4	_____
_____	33	K5	_____
_____	36	L6	_____
_____	45	M9	_____

_____ 7.0 Print out A incore thermocouple map (short form-most recent) on utility typewriter (refer to page A-45 of computer codebook if utility typewriter is inoperable).

_____ 7.1 Press "Incore T/C Map" pushbutton

Natural Circulation Verification (cont.)

Initials

_____ 7.2 25 value 1

_____ 7.3 10 value 2

_____ 7.4 1 value 3

_____ 7.5 Press "Start" pushbutton

NOTE: Verify that the incore temperatures all show ≧ 50°F subcooling from saturation, as they are the most reliable temperature indication.

NOTE: The incore thermocouple maps should be run every ∿ 30 min for continued verification of cooldown.

8.0 Verify that the operable steam generator pressures are following the saturation curve for the wide range Tc using the following.

_____ 8.1 "A" Steam Generator

PI-2474 _____ psig PI-2475 _____ psig

PI 2476 _____ psig

_____ 8.2 "B" Steam Generator

PI-2484 _____ psig PI-2485 _____ psig

PI 2486 _____ psig

_____ 8.3 "C" Steam Generator

PI-2494 _____ psig PI-2495 _____ psig

PI 2496 _____ psig

_____ 9.0 Make all changes in auxiliary feed water flow, and steam flow slowly to prevent upset to the thermal driving head of natural circulation during plant subsequent cooldown.

_____ 10.0 If it has been determined that the core is not being adequately cooled in natural circulation, as verified by increasing core exit thermocouple readings. Commence the following actions as required to restore adequate core cooling.

NOTE: If any of the below actions correct the malfunction refer back to Step 1.0 to verify proper cooling.

Natural Circulation Verification (cont.)

Initials

_____ 10.1 Increase the steaming rate from the operable steam generators by:

_____ 10.1.1 Dumping steam to the main condenser via steam dumps.

_____ 10.1.2 Operation of power operated relief valves.

_____ 10.2 Open the pressurizer power operated relief valves as required.

NOTE: Open the pressurizer PORV's only if:

1. SIS or charging is available to deliver to the RCS.

2. RCS depressurization cannot be accomplished by steam relief from the steam generators.

3. Feedwater is not available to maintain the steam generator secondary water level at an effective level.

_____ 10.3 If no means for RCS depressurization are available, or if the depressurization did not result in decreasing core exit thermocouple temperatures, then start a reactor coolant pump, if possible.

Initials

VERIFICATION OF ΦA AND/OR ΦB CONTAINMENT ISOLATION FROM SI AND/OR CDA

1. SI (ΦA) Verification

1.1 Verify Automatic Valve Operation on "H" Safeguards Panel.

(√) OPEN (RED)

_____ MOV-2867A BIT inlet

_____ MOV-2867C BIT outlet

_____ MOV-SW-200A SW to Spray header

_____ MOV-SW-200B SW to Spray header

(√) CLOSED (GREEN)

_____ TV-2884A BIT recirc.

_____ TV-2884C BIT recirc.

_____ MOV-2380 Seal water return

(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)
BD 200A __	CV 250A __	DA 200A __	LM 200C __	LM 201A&C __	RM 200A __	SI 200A __	SS 200A __	SS 203 __	SS 212A __
BD 200C __	CV 250C __	DG 200A __	LM 200E __	VG 200A __	RM 200B __	MS 209A __	SS 201A __	SS 204A __	IA 201A __
BD 200E __	SI 201 __	LM 200A __	LM 200G __	TV 2519A __	MS 210A __	TV 2859 __	SS 202A __	SS 206A __	IA 202A
							SV 202-1__	SV 202-2 __	

_____ Valve Monitor #3 light off

Initials

1.0 SI (ΦA) Verification (cont.)

_____ 1.2 Verify Automatic Valve Operation on "J" Safeguards Panel.

(√) OPEN (RED)

_____ MOV-2867B BIT inlet

_____ MOV-2867D BIT outlet

(√) CLOSED (GREEN)

_____ TV-2884B BIT recirc.

_____ MOV-2381 Seal water return

(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)	(√)
BD 200B __	CV 250B __	DA 200B __	LM 200D __	LM 201B&D __	RM 200C __	SI 200B __	SS 200B __	SS 203B __	SS 212B __
BD 200D __	CV 250D __	DG 200B __	LM 200F __	VG 200B __	RM 200D __	MS 209B __	SS 201B __	SS 204B __	IA 201B __
BD 200F __	SI 2936 __	LM 200B __	LM 200H __	MS 210B __	TV 2204 __	TV 2842 __	SS 202B __	SS 206B __	IA 202B __
							SV 203 __		

Initials

1.0 SI (ΦA) Verification (cont.)

_____ 1.3 Verify Automatic Valve Operation on "Benchboard".

(√) OPEN (RED)

_____ MOV-2115D RWST to Chg. pumps

_____ MOV-2115B RWST to Chg. pumps

(√) CLOSED (GREEN)

_____ MOV-2115C VCT to Chg. pumps

_____ MOV-2115E VCT to Chg. pumps

_____ MOV-2289A Normal charging header

_____ MOV-2289B Normal charging header

_____ MOV-2373 Common recirc.

_____ HCV-2200A Letdown orifice

_____ HCV-2200B Letdown orifice

_____ HCV-2200C Letdown orifice

(√) CLOSED ON LOW PZR LEVEL (GREEN) (< 15% Level)

_____ LCV-2460A Letdown isolation

_____ LCV-2460B Letdown isolation

1.4 Verify Automatic Valve Operation on "Backboard".

(√) CLOSED (GREEN)

_____ MOV-2275A 2-CH-P-1A Recirc.

_____ MOV-2275B 2-CH-P-1B Recirc.

_____ MOV-2275C 2-CH-P-1C Recirc.

Initials

1.0 SI (ΦA) Verification (cont.)

_____ 1.5 Verify the following Automatic Actions:

#2 Ventilation Panel:

(√) CLOSED (GREEN)

_____	AOD-HV-160-2	Control room vent
_____	AOD-HV-161-2	Control room vent

#1 Ventilation Panel:

(√) CLOSED (GREEN)

_____	AOD-HV-160-1	Control room vent
_____	AOD-HV-161-1	Control room vent
_____	1-HV-F-15 (Tripped)	Control room exhaust fan

_____ 1.6 Verify auto initiation of the bottled fresh air supply to the control room (PI-HV-1311, PI-HV-2311), and positive pressure in the control room (PDI-HV-100, PDI-HV-200).

_____ 1.7 Verify that the containment vacuum pumps trip (2-CV-P-3A, 2-CV-P-3B).

_____ 1.8 Verify 1-SW-P-1B and 2-SW-P-1B started and that 1-SW-P-1A or 1-SW-P-4 and that 2-SW-P-1A or 2-SW-P-4 started.

Initials

2.0 CDA (ΦB) Verification (This section is to be completed only if required)

_____ 2.1 Verify the following Automatic Operations on "H" Safeguards Panel.

(√) CLOSED (GREEN)

(√)	(√)	(√)	(√)
CC 205A __	CC 202A __	CC 204A __	CC 201A __
CC 205B __	CC 202C __	CC 204B __	CC 203A __
CC 205C __	CC 202E __	CC 204C __	

_____	MOV-SW-210A	Air recirc. cooler
_____	MOV-SW-214A	Air recirc. cooler
_____	MOV-SW-208A	Component cooling

(√) OPEN (RED)

_____	MOV-SW-203A	RS HX A supply
_____	MOV-SW-203D	RS HX D supply
_____	MOV-SW-204A	RS HX A return
_____	MOV-SW-204D	RS HX D return
_____	MOV-SW-201A	RS HX header supply
_____	MOV-SW-201C	RS HX header supply
_____	MOV-SW-205A	RS HX header return
_____	MOV-SW-205C	RS HX header return
_____	MOV-QS-200A	QS pump suction
_____	MOV-QS-201A	QS pump discharge
_____	MOV-QS-202A	From chem. add. tank (5 min. T.D.)
_____	MOV-RS-256A	RS pump discharge
_____	MOV-RS-255A	RS pump suction
_____	2-QS-P-1A	Quench spray pump starts
_____	2-RS-P-1A	Inside recirc. spray pump starts after 3 ½ min. T.D. (Verify rotation by blue light lit)
_____	2-RS-P-2A	Outside recirc. spray pump starts after 3 ½ min. T.D.

Initials

2.0 CDA (Φ) Verification (cont.)

_____ 2.2 Verify the following Automatic Operations on "J" Safeguards panel.

(√) CLOSED (GREEN)

(√)	(√)	(√)	(√)
CC 200A __	CC 202B __	CC 204A __	CC 201B __
CC 200B __	CC 202D __	CC 204B __	CC 203B __
CC 200C __	CC 202F __	CC 204C __	

_____	MOV-SW-210B	Air recirc. cooler
_____	MOV-SW-214B	Air recirc. cooler
_____	MOV-SW-208B	Component cooling

(√) OPEN (RED)

_____	MOV-SW-203B	RS HX A supply
_____	MOV-SW-203C	RS HX D supply
_____	MOV-SW-204B	RS HX A return
_____	MOV-SW-204C	RS HX D return
_____	MOV-SW-201B	RS HX header supply
_____	MOV-SW-201D	RS HX header supply
_____	MOV-SW-205B	RS HX header return
_____	MOV-SW-205D	RS HX header return
_____	MOV-QS-200B	QS pump suction
_____	MOV-QS-201B	QS pump discharge
_____	MOV-QS-202B	From chem. add. tank (5 min. T.D.)
_____	MOV-RS-256B	RS pump discharge
_____	MOV-RS-255B	RS pump suction
_____	2-QS-P-1B	Quench spray pump starts
_____	2-RS-P-1B	Inside recirc. spray pump starts after 3 ½ min. T.D. (Verify rotation by blue light lit)
_____	2-RS-P-2B	Outside recirc. spray pump starts after 3 ½ min. T.D.

Initials

2.0 CDA (Φ) Verification (cont.)

2.3 Verify the following Automatic Operations on the bottled air/ casing cooling panel.

(√)

_____ 2-RS-P-3A casing cooling pump starts

_____ 2-RS-P-3B casing cooling pump starts

_____ MOV-RS-200B casing cooling supply open

_____ MOV-RS-201A casing cooling supply open

_____ MOV-RS-200A casing cooling supply open

_____ MOV-RS-201B casing cooling supply open

2.4 Verify the following Automatic Operations on Ventilation Panel.

_____ 2.4.1 "H" Bus Powered Section

(√) TRIPPED

_____ 2-HV-F-1A Air recirc. fan

_____ 2-HV-F-1C Air recirc. fan

_____ 2-HV-F-37A CRDM cooling fan

_____ 2-HV-F-37B CRDM cooling fan

_____ 2-HV-F-37C CRDM cooling fan

(√) CLOSED (GREEN)

_____ TV-SW-201A Air recirc. cooler supply

_____ TV-SW-201B Air recirc. cooler return

_____ MOV-SW-210A Air recirc. cooler return

_____ MOV-SW-214A Air recirc. cooler return

DIVERT TO IODINE FILTER

_____ AOD-HV-107B Aux. Bldg.

_____ AOD-HV-228 Sfgd. Bldg.

Initials

2.0 CDA (ΦB) Verification (cont.)

_____ 2.4.2 "J" Bus Powered Section

(√) TRIPPED

_____	2-HV-F-1B	Air recirc. fan
_____	2-HV-F-1C	Air recirc. fan
_____	2-HV-F-37D	CRDM cooling fan
_____	2-HV-F-37E	CRDM cooling fan
_____	2-HV-F-37F	CRDM cooling fan

(√) CLOSED (GREEN)

_____	TV-SW-201A	Air recirc. cooler supply
_____	TV-SW-201B	Air recirc. cooler return
_____	MOV-SW-210B	Air recirc. cooler return
_____	MOV-SW-214B	Air recirc. cooler return

DIVERT TO IODINE FILTER

_____	AOD-HV-107A	Aux. Bldg.
_____	AOD-HV-228	Sfgd. Bldg.

_____ 2.5 Verify Automatic starts on radiation monitoring panel.

(√) SAMPLE PUMPS RUNNING (After 2 min. T.D.)
(Verify red "low flow" lights not "ON".)

_____	2-SW-P-5	for RS HX	2-RS-E-1A
_____	2-SW-P-6	for RS HX	2-RS-E-1B
_____	2-SW-P-7	for RS HX	2-RS-E-1C
_____	2-SW-P-8	for RS HX	2-RS-E-1D

2.6 On the Main Control Board verify that the component cooling water pumps trip (√).

_____ 2-CC-P-1A

_____ 2-CC-P-1B

POST LOCA LOG

DATE/TIME	LHSI PUMPS				OUTSIDE RECIRC SPRAY PUMPS				CONTAINMENT SUMP TEMP.	
	2-SI-P-1A		2-SI-P-1B		2-RS-P-2A		2-RS-P-2B			
	FLOW (FI-2945)	MOTOR AMPS	FLOW (FI-2946)	MOTOR AMPS	DISCH. PRESS PI-RS256A	MOTOR AMPS	DISCH. PRESS PI-RS256B	MOTOR AMPS	TI-RS-250A	TI-RS250B