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ACCESSION NBR:8202180136 DOC.DATE: 82/02/12 NOTARIZED: NO DOCKET #
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CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Advises that util meets regulatory criteria for operator action, based on review of NRC 811231 safety evaluation of SEP Topic VI-7.B for ESF switchover & recalculation of Emergency Procedure E-1.2, "Loss of Reactor Coolant."

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JOHN E. MAIER
Vice President

TELEPHONE
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February 12, 1982

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: SEP Topic VI-7.B, ESF Switchover
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

Rochester Gas and Electric has reviewed the NRC draft safety evaluation report for the systems review of SEP Topic VI-7.B, "ESF Switchover", transmitted by letter dated 12/31/81 for Dennis M. Crutchfield to John E. Maier. We have also reviewed our Emergency Procedure E-1.2, "Loss of Reactor Coolant", to verify the accuracy of the NRC evaluation. One difference noted is that, at 31% RWST level, the operator is to stop only one SI and one CS pump, but not to stop any RHR pumps.

Based on these reviews, RG&E has recalculated the time available for the operator to perform critical ESF Switchover actions, and concluded that the "one-minute-per-action" criterion can be met with the present procedure. This analysis is presented in the attachment. The fact that the RG&E system meets this criterion does not, however, imply that we believe this time interval to be proper. Given the simple nature of the procedural actions, and the placement of control switches on the control board, we believe that the entire switchover can be completed in less than five minutes (as specified in the procedure). We suggest that, during the Integrated Assessment meeting to be scheduled at Ginna Station, the Integrated Assessment Review Team verify the timing of the ESF Switchover procedure by observing a walkthrough of the procedure by the operators, if deemed necessary.

It is thus concluded that the Ginna plant meets the regulatory criteria for operator action provided in the draft SER for this topic.

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Rochester Gas and Electric is also at the present time conducting a review of expected post-accident flow rates and available pump NPSH. Based on preliminary results, it appears that runout flow rates for the Safety Injection, Residual Heat Removal, and Containment Spray pumps are less than those used in the analysis (yet substantially higher than the minimum requirements used in the ECCS analysis). These reduced flow rates would result in longer time periods available to the operator to take critical switchover actions.

Rochester Gas & Electric has also reviewed the October 26, 1981 NRC evaluation of the electrical portion of this topic review. In that review, the NRC concluded that redundant RWST level indication should be provided. RG&E concurs with that conclusion, and will install a second qualified RWST level transmitter. Thus, there will exist redundant level transmitters, level indication, and level alarms. It is expected that this modification can be completed by September, 30, 1982.

Very truly yours,

John E. Maier

Enclosures

Attachment: Evaluation of Operator Action Times Available to Perform Critical Post-LOCA ESF Switchover Functions

1. Shut Off Operating Pumps at 10% RWST Level Indication

Assuming that two SI, two RHR, and one CS pump is operating at 10% level, flow rate is 550 x 2 + 2000 x 2 + 1615 = 6715 gpm

Volume at 10% is 34250 gallons

OPERATOR ACTIONS:

Time	Action	Remaining RWST Volume	Remaining Flow
1 minute	Shut off 1 SI pump	27535 gal.	6165 gpm
2 minutes	Shut off 2nd SI pump	21370 gal.	5615 gpm
3 minutes	Shut off CS pump	15755 gal.	4000 gpm
4 minutes	Shut off 1 RHR pump	11755 gal.	2000 gpm
5 minutes	Shut off 2nd RHR pump	9755 gal.	0

Thus, 9755 - 6165 = 3590 gallons would remain in the RWST above the RWST outlet nozzles.

2. Re-establish ECCS Flow

2A. Calculate available water inventory available for boil off, without fuel assembly uncovering (see Enclosure 1).

From Ginna reactor vessel drawing, it is estimated that 235 ft^3 of water is available above the core. This corresponds to an energy total of

$$235\ ft^3 \left[\rho_{f\ 212}\right]\left[h_{g\ 212} - h_{f\ 100}\right]$$

$$= 235\ ft^3 \left[59.8\ \frac{lbm}{ft^3}\right]\left[1150 - 68\right]\ \frac{Btu}{lbm}$$

$$= 1.52 \times 10^7\ Btu$$

2B. Decay heat at 30 minutes, based on the ANS decay heat curve (without the additional 20% margin).

$$(1.67\%)\ (1520\ Mwt)\ (3413 \times 10^3\ Btu/hr/Mwt) = 8.66 \times 10^7\ \frac{Btu}{hr}$$

Enclosure 1, Sheet 1

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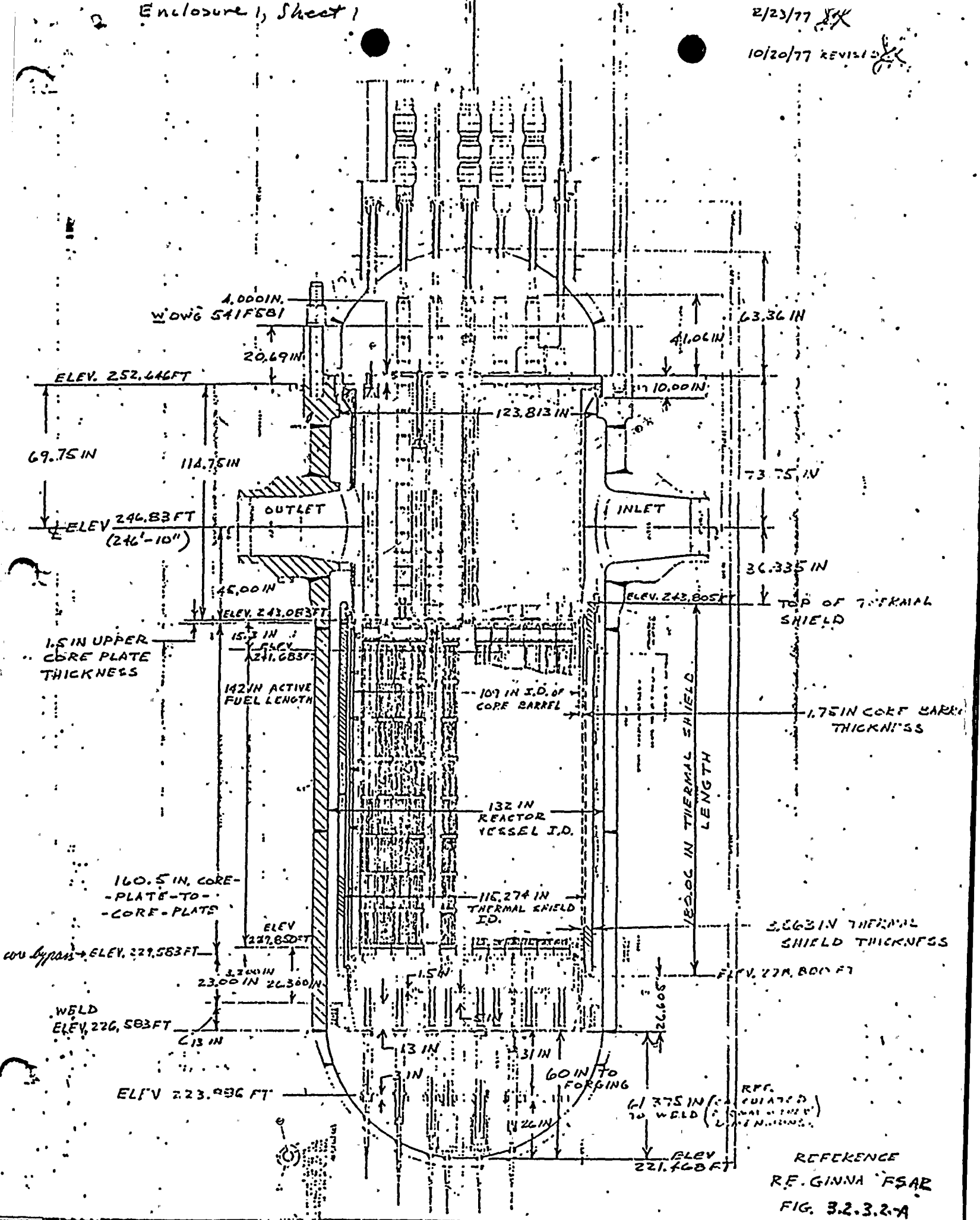
10/20/77 REVISED



REFERENCE
R.E. GINNA FSAR
FIG. 3.2.3.2-A

Enclosure 1, Sheet 2

Primary and Secondary Volumes

Reactor Vessel	Volume - cu. ft.
Upper Head (Dome)	294.1
Upper Plenum	634.7
Core (142 in.)	317.1
Lower Plenum	533.2
Downcommer	654.4
Loops	
Hot Leg	77.6
Cross Over Leg	139.4
Cold Leg	46.9
Reactor Coolant Pump	192
Pressurizer	800
HZP	217.0 liquid
HFP	393.3 liquid
Surge line	12.8
Steam Generator	
Inlet Plenum	141.6
Outlet Plenum	141.6
Tubes	644.9
Steam Side	4,579
HZP	2,821 water 1,758 steam
HFP	1,681 water 2,898 steam
"A" S.G. to MSIV	776
"B" S.G. to MSIV	1,055
MSIVs plus 36 in. header	223.9
36 in. header to stop valve	389.9
36 in. header to stop valve	288.5

Enclosure 2: Excerpt from E1.2, Loss of Reactor Coolant

3.8.4 When the refueling water storage tank low level alarm is actuated at 31%, stop one safety injection pump and one containment spray pump.

3.8.5 Stop auxiliary feedwater flow to the steam generators when the level has increased to 40%.

3.8.6 If a charcoal filter high temperature alarm is actuated, open the charcoal filter dousing valves 875A, B or 876A, B.

3.8.7 Restore Service Water Flow to both component cooling water heat exchangers, if lost, by opening MOV 4616 and 4735 for "A" Hx, and MOV 4615 and 4734 for "B" Hx, and start both component cooling water pumps.

3.8.7.1 Ensure that the component cooling system's supply and return lines associated with containment users are isolated from the outside portion of the system by closing or ensuring closed the following remote operated C.I. valves.

3.8.7.2 Close supply lines
MOV 817 (Common CC supply to Containment)
MOV 749A (CC supply to "A" RCP)
MOV 749B (CC supply to "B" RCP)
MOV 813 (CC supply to Reactor Support Coolers).

3.8.7.3 Close return lines
MOV 759A (CC return from "A" RCP)
MOV 759B (CC return from "B" RCP)
AOV 745 (CC return from Excess Letdown Heat Exchanger)
MOV 814 (CC return from Reactor Support Cooler)
NOTE: Valves 813 and 814 isolate automatically

3.8.8 Ensure that component cooling flow is established to the residual heat exchangers by opening MOV-738A and MOV 738B CCW from RHR Heat Exchanger.

3.8.9 Verify that component cooling low flow alarms to the residual heat removal, containment spray and safety injection pumps are not actuated.

3.8.9.1 Alarm A-9 RHR Pump Cooling Water Outlet low flow.

3.8.9.2 Alarm A-14 Safety Injection Pumps Cooling Water Outlet low flow.

3.8.9.3 Alarm A-6 Containment Spray Pumps Water Outlet low flow.

3.8.10 Determine by PR-420 if reactor coolant system pressure will permit recirculation without the use of a high head injection pump (system pressure below 140 psig).

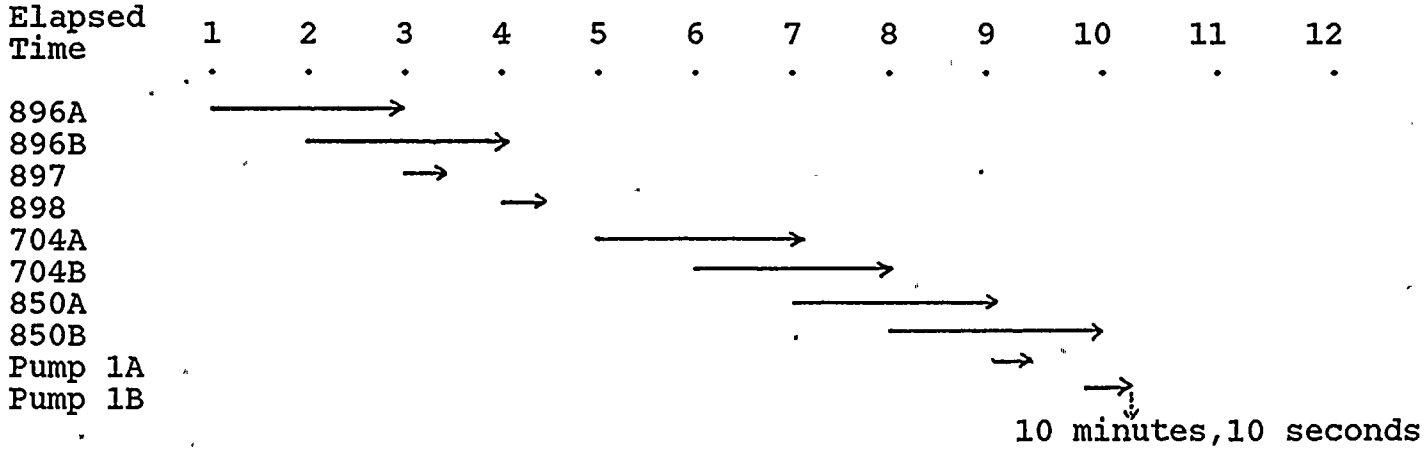
2C. Time available to re-establish ECCS flow

$$(1.52 \times 10^7 \text{ Btu}) / 8.66 \times 10^7 \frac{\text{Btu}}{\text{hr}} = .175 \text{ hr} = 10.5 \text{ minutes}$$

2D. Operator Actions Required to Perform ECCS Alignment per E1.2 (see Enclosure 2).

Close Valve 896A
Close Valve 896B
Close Valve 897
Close Valve 898
Close Valve 704A
Close Valve 704B
Open Valve 850A
Open Valve 850B
Start RHR Pump 1A
Start RHR Pump 1B

At 1 minute per action, including valve travel times and pump start times, the above sequence would require 10 minutes and 10 seconds to get both trains in service.



Enclosure 2, Sht 2 – EXCERPT FROM E-1.2, LOSS OF REACTOR COOLANT

3.8.11 If spray additive has been actuated during the injection phase and spray additive tank level is higher than 40% or if containment pressure is > 30 psig, prepare to initiate recirculation with containment spray.

3.8.12 At 10% in RWST, stop the operating safety injection, containment spray and residual heat removal pumps, proceed to the recirculation phase.

3.8.13 Recirculation Phase

Important: THE SWITCHOVER SHOULD BE COMPLETED AS RAPIDLY AS POSSIBLE (WITHIN 5 MINUTES), SINCE DURING THIS TIME THE CORE IS NOT RECEIVING ANY ADDITIONAL EMERGENCY COOLING WATAER.

PRECAUTION: If at any time during the Recirculation Phase of the accident offsite power is lost, start at the beginning of the Recirculation Phase of this procedure and reverify and start equipment as necessary after Emergency Diesel Generators tie into their respective buses.

3.8.13.1 In the event that failure(s) of ECCS equipment or other conditions lead to inadequate fuel cooling notify authorities per SC-1.4 General Radiation Emergency, using telephone numbers in SC-1.3A.

3.8.13.2 In the event of inadequate fuel cooling refer to E-1.5 Void Formation in the RCS for appropriate additional operations.

3.8.14 Verify the valve status and align valves as follows for recirculation using the RHR pumps.

VERIFY THAT THE FOLLOWING MOV VALVES ARE CLOSED:

826A	Boric Acid Storage Tank to Safety Injection Pumps
826B	Boric Acid Storage Tank to Safety Injection Pumps
826C	Boric Acid Storage Tank to Safety Injection Pumps
826D	Boric Acid Storage Tank to Safety Injection Pumps
857A	RHR Pumps to Safety Injection Pumps & Containment Spray Pumps
857B	RHR Pumps to Safety Injection Pumps & Containment Spray Pumps
857C	RHR Pumps to Safety Injection Pumps & Containment Spray Pumps
1813A	RCDT Pump Suction from Sump B
1813B	RCDT Pump Suction from Sump B
700	RCS to RHR pump suction
701	RCS to RHR pump suction
720	RHR Discharge to RCS
721	RHR Discharge to RCS

CLOSE THE FOLLOWING MOV'S AND AOV'S

*896A, RWST to SI Pumps

896B, RWST to SI Pumps

Enclosure 2, Sheet 3, EXCERPT
FROM E1.2, LOSS OF REACTOR COOLANT

NOTE: To close 896 A or B the D.C. power hold switch labeled 896A or B "KEY SWITCH" must be placed in the "ON" position. After placing valve in proper position return key switch to "OFF".

*897	SI Pumps Recirculation to RWST
*898	SI Pumps Recirculation to RWST
*704A	RHR Pump "A" Suction Cross-Tie
*704B	RHR Pump "B" Suction Cross-Tie

VERIFY THAT THE FOLLOWING MOV VALVES ARE OPEN:

852A	RHR Discharge to Reactor Vessel
852B	RHR Discharge to Reactor Discharge
878B	Safety Injection Pump Discharge Loop B Cold Leg
878D	Safety Injection Pump Discharge Loop A Cold Leg
851A	RHR Pump Suction from Sump B Inside Containment
851B	RHR Pump Suction from Sump B Inside Containment
1815A	1C Safety Injection Pump Suction Valve
1815B	1C Safety Injection Pump Suction Valve
825A	Safety Injection Pumps Suction from RWST
825B	Safety Injection Pumps Suction from RWST

3.8.15 *OPEN THE FOLLOWING MOV:

3.8.15.1 850A and 850B RHR Pump Suction From Sump B Outside Containment

3.8.16 Low Head Recirculation

3.8.16.1 Start 1A and 1B residual heat removal pumps.

3.8.16.2 Check flow meter FI-626 to ensure that low head recirculation is adequate. If FI reading is not at least 400 gpm, switch to high head recirculation. Refer to Step 3.8.18.

3.8.16.3 Close MOV 856, RWST to RHR Suction. To operate MOV 856, AC power must be restored at the motor control center (breaker 10C MCC 1C).

3.8.16.4 The following could be indications of passive failure in the low head recirculation path:
Abnormal flow on FI-626.
Flow on FI-931A or FI-931B.
High water level alarm in auxiliary building sump.
High radiation level alarms in the auxiliary building.

NOTE: By exercising HCV-624, and HCV-625, and by watching the corresponding indications on FI-626, FI-931A and FI-931B, the operator should detect the failure location, isolate it, and use an alternate path for recirculation.