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CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Forwards responses to Questions 1,2,3,5 & 6 of SEP Topic VI-7.B re ESF switchover, per 810227 ltr.

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	SEP BR	12	3	3				
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AUG 27 1981

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August 18, 1981

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U.S. NUCLEAR REGULATORY COMMISSION

Director of Nuclear Reactor Regulation
Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
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:

Attached is a response to your letter of February 27, 1981 regarding this SEP topic. Based on subsequent correspondence between Dennis M. Crutchfield and James A. Kay of Yankee Atomic Electric Company, dated June 4, 1981, it has been determined that the major NRC staff focus for this review concerns the instrumentation and controls used to indicate Refueling Water Storage Tank level and to terminate the injection phase of Emergency Core Cooling. The bases for this re-focus are provided in Section V of this referenced letter.

Rochester Gas and Electric will thus respond only to questions 1, 2, 3, 5, and 6 of the February 27, 1981 letter. The information requested in question 4 can only be obtained via a detailed hydraulic set of calculations, which are not available at this time. If required to complete this topic assessment, a schedule for this analysis can be provided. It appears, however, that the particular concerns of this SEP topic assessment are addressed in our responses submitted in the attachment.

Very truly yours,

John E. Maier

Attachment

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PDR ADOCK 05000244
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Attachment: Additional Information Requested
By February 27, 1981 Letter Regarding
SEP Topic VI7.B, "ESF Switchover"

(1) Describe the procedures used to switchover from the injection to the recirculation mode of emergency core cooling (ECC).

Response 1: Ginna Emergency Procedure E-1.2, "Loss of Reactor Coolant", describes the procedure used to switch over from the injection to the recirculation mode of emergency core cooling. A condensed description is presented here.

1) At the 31% low RWST level alarm LIA-921, stop one safety injection (SI) and one containment spray (CS) pump, if more than one are running.

2) At 10% on LT-920 in the RWST, stop the operating safety injection, containment spray, and residual heat removal pumps.

3) Close the following valves:
896A, RWST to SI Pumps
896B, RWST to SI Pumps
897, SI Pump Recirculation to RWST
898, SI Pump Recirculation to RWST
704A, RHR Pump 1A Suction Cross-Tie
704B, RHR Pump 1B Suction Cross-Tie

4) Open the following valves:
850A, RHR Pump 1A Suction from Sump B
850B, RHR Pump 1B Suction from Sump B

5) Start 1A and 1B RHR Pumps

6) Check RHR flow on FI-626

This set of actions will initiate low head recirculation. If high head recirculation, or low head recirculation with spray is required, the following additional actions must be performed:

<u>High Head Recirculation</u>

1) Check RC wide range pressure PR-420

2) Open valves MOV-857A, B, C - RHR to SI and CS pump suction

3) Start Safety Injection pumps 1A and 1B

4) Check SI flow in FI-924 and FI-925

Low Head Recirculation with Spray

1) Check spray additive (NaOH) tank level LT-931 and LIA-932

2) Check containment pressure PT-944-950

3) Open valves MOV 857A, B, C - RHR to SI and CS pump suctions

4) Start Containment Spray Pump(s) 1A and/or 1B

5) Check NaOH flow FI-930

6) Check RHR and CS flows FI-931A, 931B, 626

(2) For each instrument, indicator, logic device and alarm that is used by the operator to perform a manual function or that is used to initiate an automatic function in the switchover sequence; describe how that device is qualified and installed (e.g. independence and separation of circuits) as Class 1E equipment.

Response 2: All indications required by the operator to perform a safety-related function have redundant or diverse components. The instrument bus electrical one-line diagram, RG&E drawing #21489-269 showing power supply arrangements, is attached.

1) RWST level, LT-920, on instrument bus 1C (IB1C), is backed up by level indicating alarm LIA-921 on the annunciator power transformer (normally fed from battery 1A).

2) RHR flow FI-626, on IB1C is backed up by RC wide range pressure PR-420 on IB1D. Instrument bus 1D, although fed from non-safeguards bus 15, is procedurally connected to safeguards bus 16 if offsite power is lost prior to the time that RWST-to-sump switchover would be required.

3) SI flow FI-924, on IB1A and FI-925, on IB1B, are redundant

4) NaOH tank level LT-931, on IB1C is backed up by LIA-932 on IB1B.

5) There are seven containment pressure indications PT-944 to PT-950 on redundant power sources.

6) NaOH flow FT-930 on IB1C is backed up by tank level LIA-932 on IB1B.

7) RHR flow to suction of CS and SI pumps FI-931A on IB1C and FI-931B on IB1B are redundant.

All of the instrumentation which might experience an adverse post-accident environment has been included in the RG&E environmental qualification program, as stated in letter dated October 31, 1980 from John E. Maier to Darrell G. Eisenhut.

(3) Describe the level sensing system that is used to indicate or detect the level in the tank that supplies injection coolant. This description should include sensor and data column location, freeze protection, freeze protection power supply and those items specified in (2) above.

Response 3: Level transmitter LT-920 and level indicating alarm LIA-921, whose sensors are located at the base of the RWST, provide the operator with redundant indication of RWST level. Since at Ginna the RWST is located in the auxiliary building, which is maintained above freezing temperatures, no freeze protection is provided.

(5) Describe the paths of the minimum flow lines from each ECCS pump discharge to the line end. This description should identify all valves in these lines, the signals that control each valve, the power sources for each valve, and the qualification of each valve.

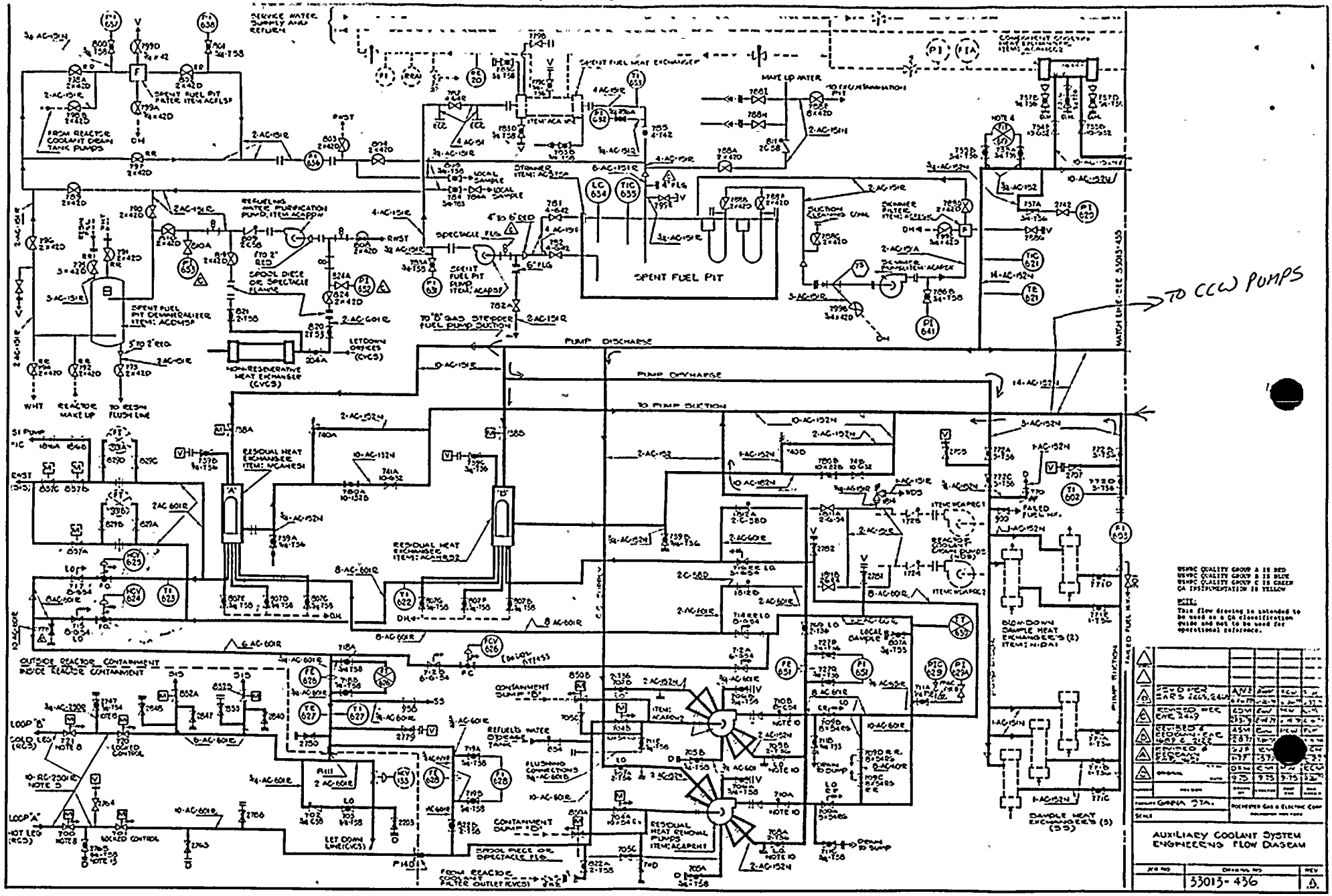
Response 5: The flow paths for these pumps are shown on RG&E drawings 33013-425, Safety Injection System, and 33013-436, Auxiliary Coolant System (attached).

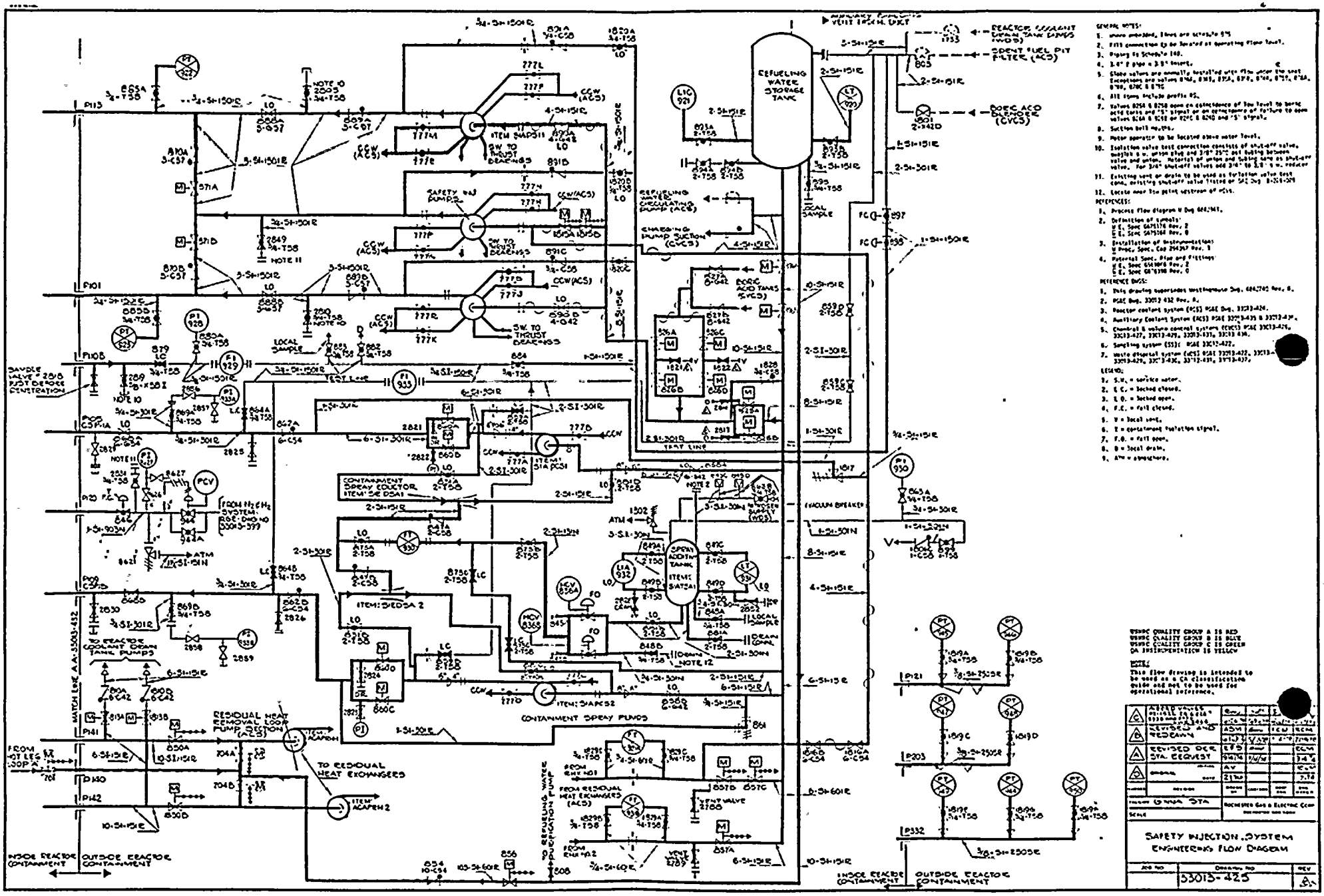
The safety injection pumps each have a minimum flow line returning to the RWST. The three lines join upstream of two series air-operated valves, AOV 897 and AOV 898. These valves do not receive an actuation signal; however, they are interlocked with motor-operated valves 857A, B, and C such that the discharge of the RHR pumps cannot be connected with the suction of the SI pumps until AOV 897 and 898 are closed. The solenoid AOV 897 is powered from instrument bus 1B; AOV 898 from instrument bus 1D. These valves fail-closed on loss of power or air.

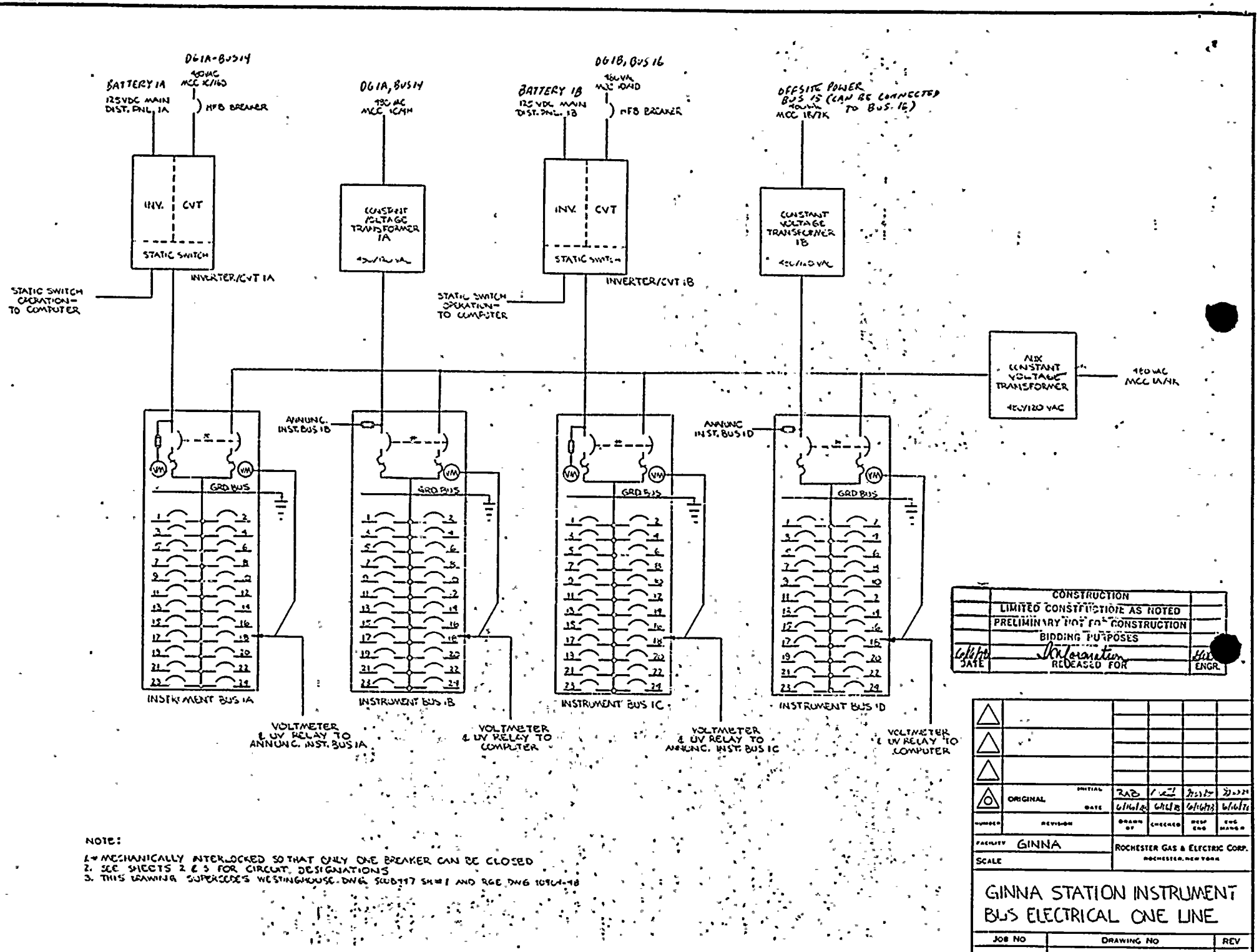
The Containment Spray pumps have a recirculation line from the discharge to the suction of the pumps, with manual locked-open valves. The RHR pumps recirculate from the discharge of the pumps through the RHR heat exchangers, and through a common line via recirculation orifice FE 628 to the suction of the pumps. These are no valves in the recirculation path.

(6) For each minimum flow line that returns to a point other than the pump intake point, provide a single failure analysis and quantify the offsite dose rate, dose, and dose assumptions obtaining from all single failures that do not isolate these lines during the recirculation phase at ECC.

Response 6: As noted in response 5 above, only the SI pumps recirculate back to the RWST. Redundant air-operated valves, which fail-closed, are interlocked with the 857A, B and C valves in the line leading from the discharge of the RHR to the SI pumps. No single failure would thus prevent failure to close this minimum flow line.


SPENT FUEL PIT
TO CCW PUMPS
PUMP DISCHARGE
TO PUMP SUCTION
AUXILIARY COOLANT SYSTEM
ENGINEERING FLOW DIAGRAM
33013-436


REFUELING WATER STORAGE TANK
CONTAINMENT SPRAY PUMPS
RESIDUAL HEAT REMOVAL LOOP PUMP SECTION (ACS)
TO RESIDUAL HEAT EXCHANGERS
TO REFUELING WATER RECIRCULATION PUMP
INSIDE REACTOR CONTAINMENT
OUTSIDE REACTOR CONTAINMENT
SAFETY INJECTION SYSTEM ENGINEERING FLOW DIAGRAM
53013-425



CONSTRUCTION
LIMITED CONSTRUCTION AS NOTED
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NOTE:
1. = MECHANICALLY INTERLOCKED SO THAT ONLY ONE BREAKER CAN BE CLOSED
2. SEE SHEETS 2 & 3 FOR CIRCUIT DESIGNATIONS
3. THIS DRAWING SUPERSEDES WESTINGHOUSE DWG. SCUD917 SH#1 AND RGE DWG 10904-48

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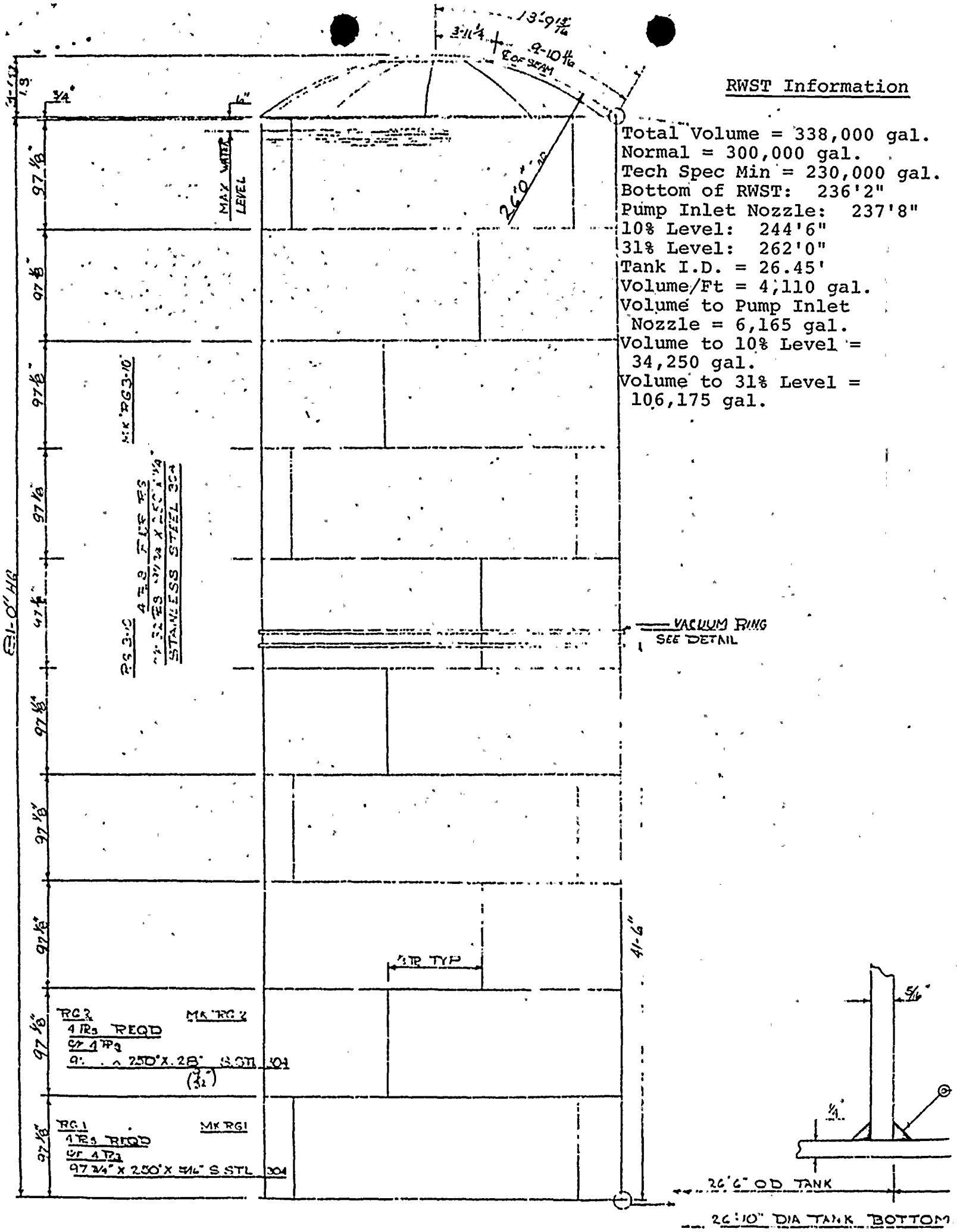
FACILITY GINNA
SCALE
ROCHESTER GAS & ELECTRIC CORP.
ROCHESTER, NEW YORK

GINNA STATION INSTRUMENT BUS ELECTRICAL ONE LINE

JOB NO	DRAWING NO	REV
	21489-269	A



RWST Information

Total Volume = 338,000 gal.
Normal = 300,000 gal.
Tech Spec Min = 230,000 gal.
Bottom of RWST: 236'2"
Pump Inlet Nozzle: 237'8"
10% Level: 244'6"
31% Level: 262'0"
Tank I.D. = 26.45'
Volume/Ft = 4,110 gal.
Volume to Pump Inlet Nozzle = 6,165 gal.
Volume to 10% Level = 34,250 gal.
Volume to 31% Level = 106,175 gal.