4.2.6.7 During operation in the nuclear instrument power range, at least three of nuclear channels 5, 6, 7, and 8 shall be in operation. Whenever a channel is deliberately made inoperative, its scram contacts shall be placed in the trip position.

4.2.6.8 Safety channels directly backed up by an identical channel or channels, performing the same safety function may be bypassed for maintenance. Safety channels in the partial scram circuit may be bypassed for maintenance provided that the reactor shall be brought to a condition under which the channel protection is not required if the bypass cannot be removed within 24 hours.

4.2.6.9 Both reactor forced circulation pumps shall be automatically shut down by a high reactor pressure signal or by a low reactor water level signal.

Bases - The RPTS is a diverse and independent backup except for common current sensing loops to the normal scram system for rapid shutdown of the reactor. To protect the primary system from an ATWS event in which either MSIV closes at power, thus eliminating the main condenser as a heat sink, the recirculation pumps must be shut down to prevent damage to the primary system. A rapid shut down of the recirculation pumps has the effect of causing an increase in the moderator voids in the reactor core. A substantial negative reactivity results and the power and pressure surges that might otherwise occur in the most limiting transient (MSIV closure) are substantially reduced. With the recirculation pumps shut down, the reactor power will be reduced to a steady state power level of less than 20% (based on natural circulation through the core).

4.2.7 Waste Disposal

4.2.7.1 All liquid waste system radioactive effluents shall be batch-sampled and analyzed prior to release.

4.2.7.2 Disposal of the radioactive gaseous waste shall be through the stack, with at least one stack blower in operation. The discharge rates shall not exceed the limits in the following chart. The maximum permissible concentrations (MPC in micro-curies per ml) shown in this chart are for individual isotopes and mixtures listed in Column 1, Table II, Appendix B of 10 CFR 20.

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I. TWO-BLOWER OPERATION

Column 1	Column 2	Column 3
Type of Activity	Maximum curies per second to be released	Curies per second to be released, avg. ove. 1 yr.
Particulate matter and halogens with half lives longer than 8 days	$5.1 \times 10^3 \times$ MPC	$5.1 \times 10^2 \times$ MPC
All other radioactive isotopes	$3.4 \times 10^6 \times$ MPC	$3.4 \times 10^5 \times$ MPC

II. ONE-BLOWER OPERATION

Particulate matter and halogens with half lives longer than 8 days	$2.4 \times 10^3 \times$ MPC	$2.4 \times 10^2 \times$ MPC
All other radioactive isotopes	$1.6 \times 10^6 \times$ MPC	$1.6 \times 10^5 \times$ MPC

	Channels	Action	Minimum Frequency
22.	CRD accumulators low gas pressure scram relay	Test	Prior to each plant startup if test has not been performed within 30 days.
		Check pressure indication	Weekly
23.	Turbine stop valve	Test	Prior to each plant startup if test has not been performed within 30 days.
24.	Reactor Pressure (RPTS)	Calibration	At each refueling shutdown
25.	Reactor Water Level (RPTS)	Calibration	At each refueling shutdown

*Test shall include tripping of the scam relays K-114.

5.2.16 Corrosion est coupons shall be inserted in the forced circulation loop to evaluate tne corrosion deterioration of chromium-molybdenum piping; and that piping shall be replaced if the reduction in pipe wall thickness, as indicated by weight loss and metallographic evaluation of the test coupons, is greater than 0.190 inches. The replacement piping shall be stainless steel or shall be clad internally with stainless steel and shall meet the design requirements of Section 2.3.2.

TABLE 1 - OPERATING LIMITS - (Cont'd)

ITEM NO.	CONDITION	CHANNEL OR SENSOR	SET POINT	ACTION	KEYSWITCH BYPASS PROVISIONS
18	reactor building ventilation exhaust	radiation monitors	≤ radiation levels which correspond to Column 2 of the limitations given in Sec. 4.2.7.2	closure of ventilation dampers	none
19	simultaneous low reactor pressure and low water level	pressure transmitter and water level safety channel 1 or 2	25-30 psig and ≤ 12" below nominal indicated level	opening of diaphragm valve allowing water to flow directly from overhead storage tank to core spray nozzles	
20	simultaneous high reactor building pressure and reactor low water level	reactor building pressure transmitter 1 or 2 and reactor water level safety channel 1 or 2	≤ 5 psig and ≤ 12" below nominal indicated level	opening of motor operating valves and start of engine driven pumps of alternate core spray system	
21	steam safety valves not fully closed	position switches on each of the three inservice safety valves	open-close	none - post accident indication only	none
22	high reactor pressure or low reactor water level	3 reactor pressure or 3 reactor level transmitters	≤ 1350 psig or ≤ 30 inches below nominal indicated level	trip of both recirculation pump breakers	the protective function can be bypassed whenever the reactor is shutdown or recirculation pump operation is required for safety reasons.

6. SCHEDULE

Procurement of necessary components and detailed final design has commenced.

With timely receipt of necessary hardware, installation is scheduled during the next refueling outage (September-October 1980).

7. REFERENCES

(1) LAC-2788: J. P. Madgett to A. Giambusso, Dairyland Power Cooperative, LACBWR, Provisional Operating License No. DPR-45, Full-Term License Application, dated October 9, 1974.

(2) NRC Letter: V. Stello to J. P. Madgett, re: LACBWR, dated August 31, 1976.

(3) LAC-4270: J. P. Madgett to V. Stello, Jr., Dairyland Power Cooperative, LACBWR Provisional Operating License No. DPR-45, Recirculation Pump Trip Modification, dated October 13, 1976.

(4) NRC Letter: D. L. Ziemann to J. P. Madgett, re: LACBWR, dated May 15, 1978.

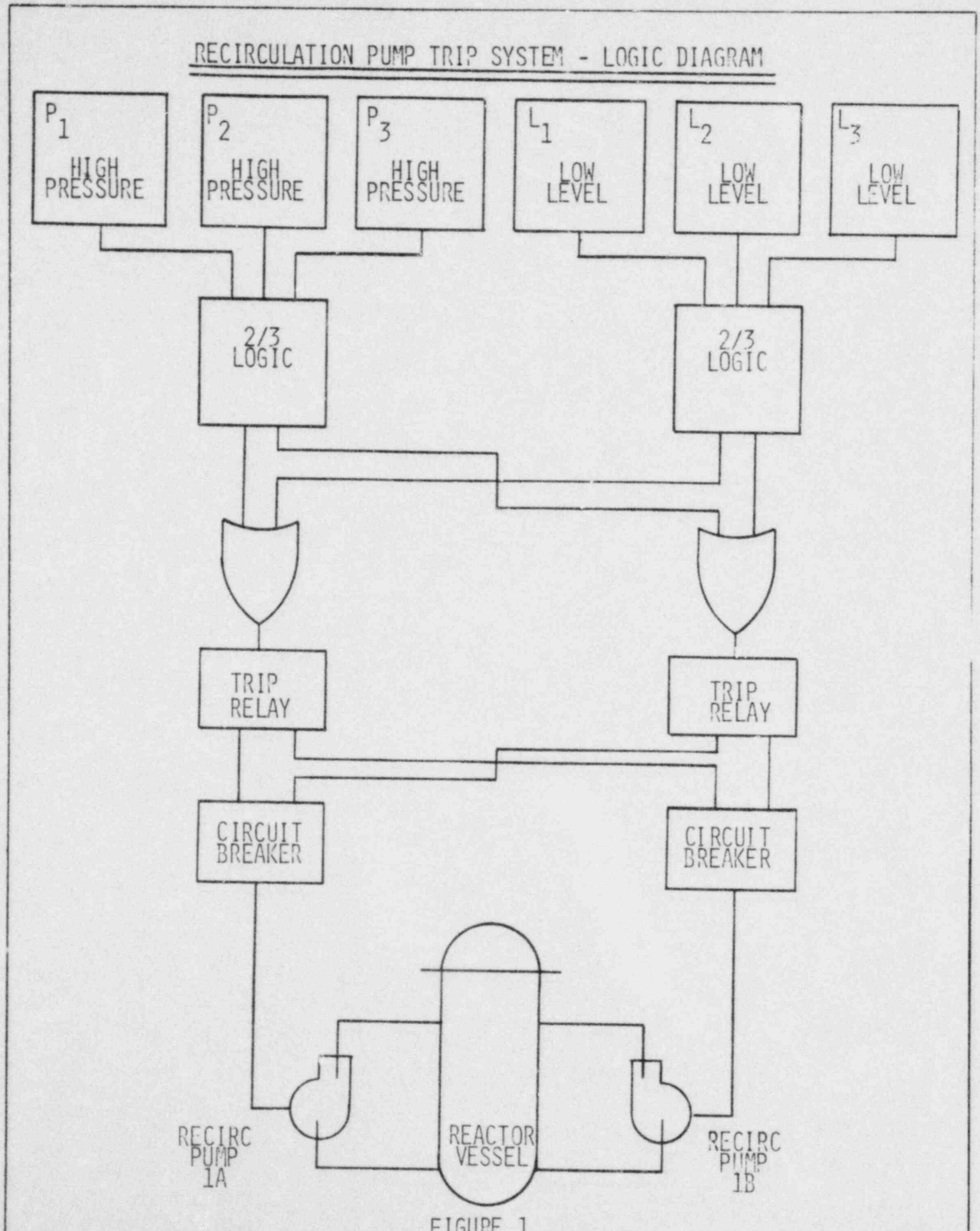

RECIRCULATION PUMP TRIP SYSTEM - LOGIC DIAGRAM
P1 HIGH PRESSURE
P2 HIGH PRESSURE
P3 HIGH PRESSURE
L1 LOW LEVEL
L2 LOW LEVEL
L3 LOW LEVEL
2/3 LOGIC
2/3 LOGIC
TRIP RELAY
TRIP RELAY
CIRCUIT BREAKER
CIRCUIT BREAKER
RECIRC PUMP 1A
REACTOR VESSEL
RECIRC PUMP 1B

FIGURE 1

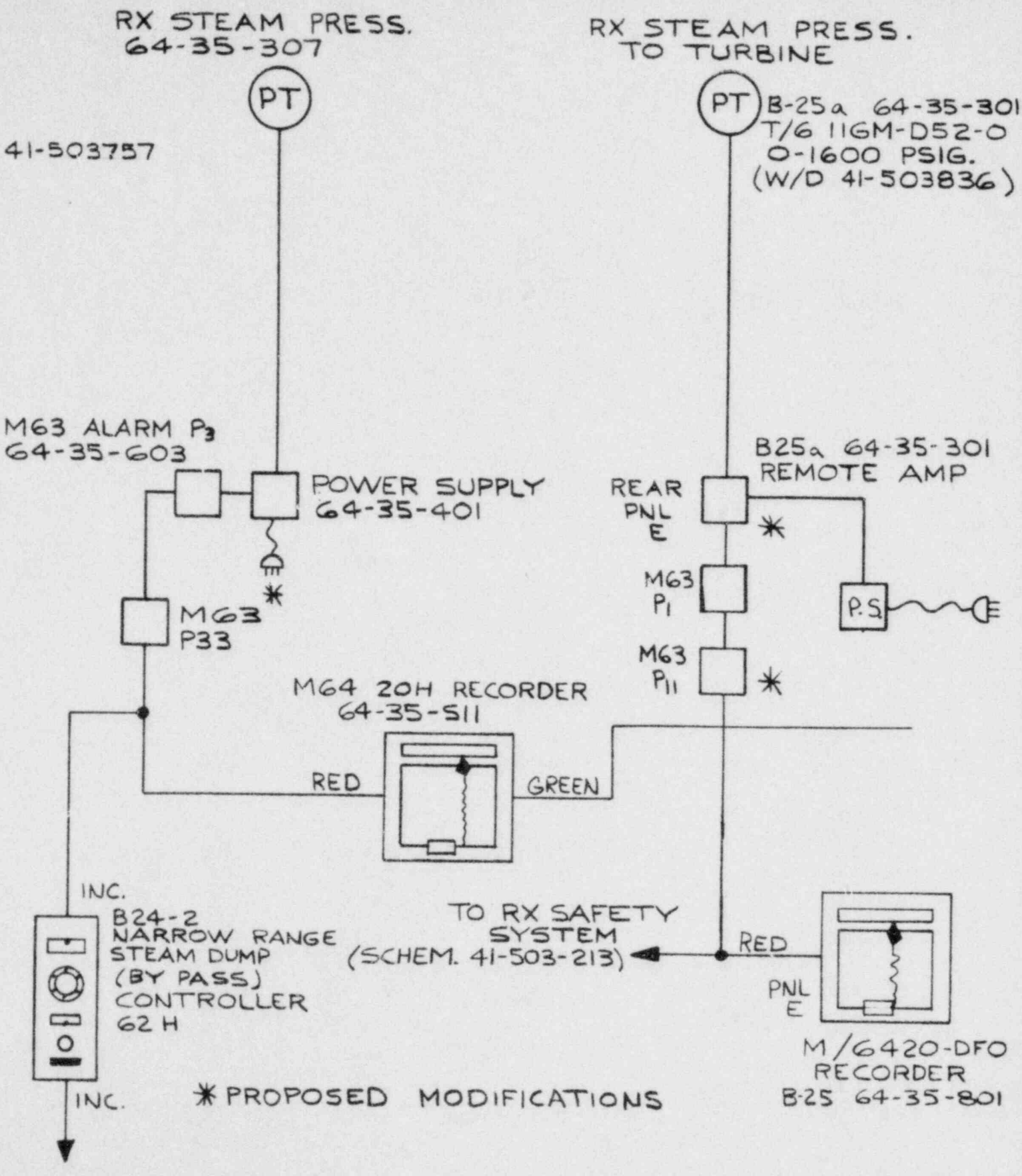

RX STEAM PRESS.
64-35-307
RX STEAM PRESS.
TO TURBINE
PT
PT
B-25a 64-35-301
T/G 11GM-D52-0
0-1600 PSIG.
(W/D 41-503836)
41-503757
M63 ALARM P3
64-35-603
POWER SUPPLY
64-35-401
B25a 64-35-301
REMOTE AMP
REAR
PNL
E
M63
P1
P.S.
M63
P33
M63
P11
M64 20H RECORDER
64-35-511
RED
GREEN
INC.
B24-2
NARROW RANGE
STEAM DUMP
(BY PASS)
CONTROLLER
62 H
TO RX SAFETY
SYSTEM
(SCHEM. 41-503-213)
RED
PNL
E
M/6420-DFO
RECORDER
B-25 64-35-801
INC.
* PROPOSED MODIFICATIONS

FIGURE 2

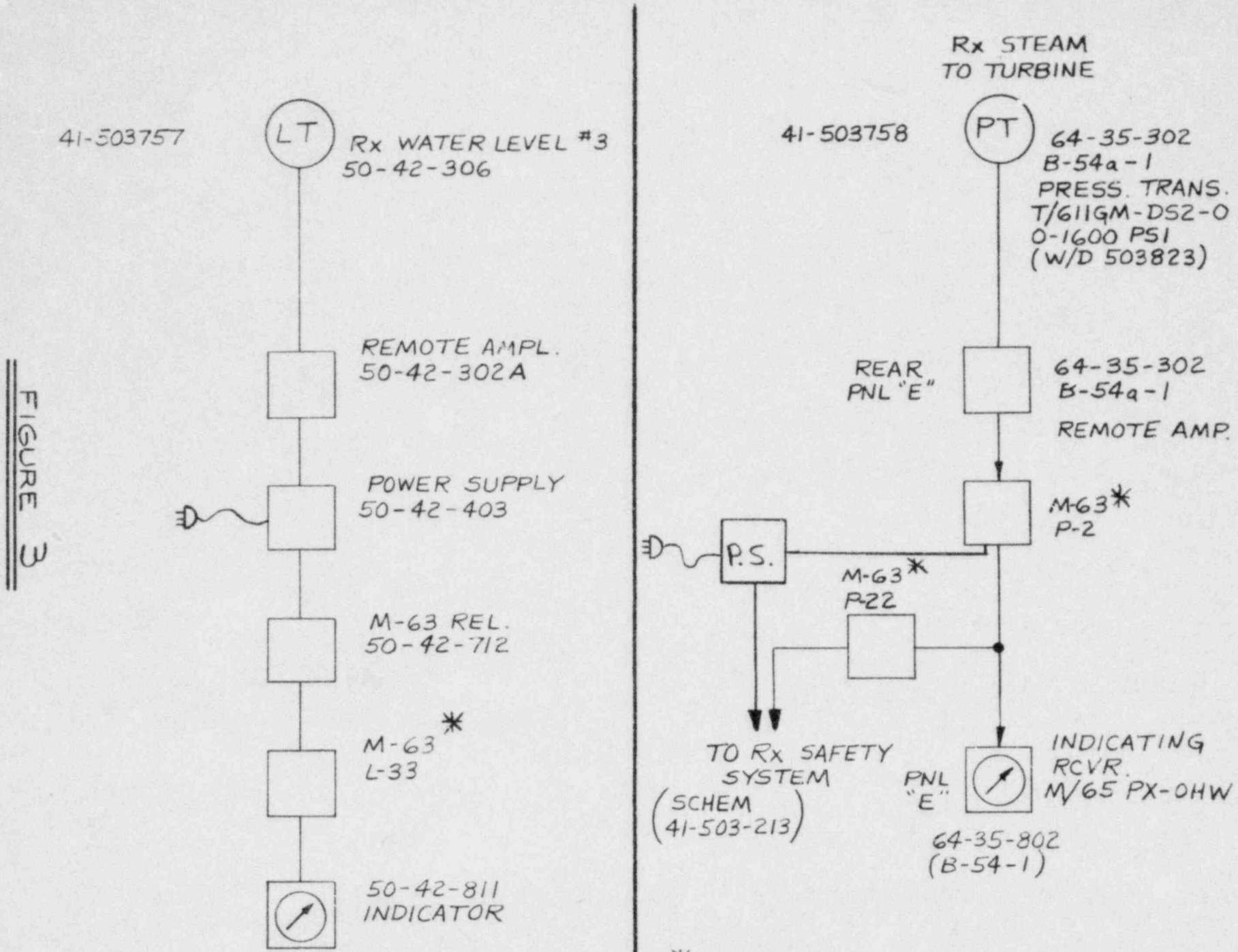
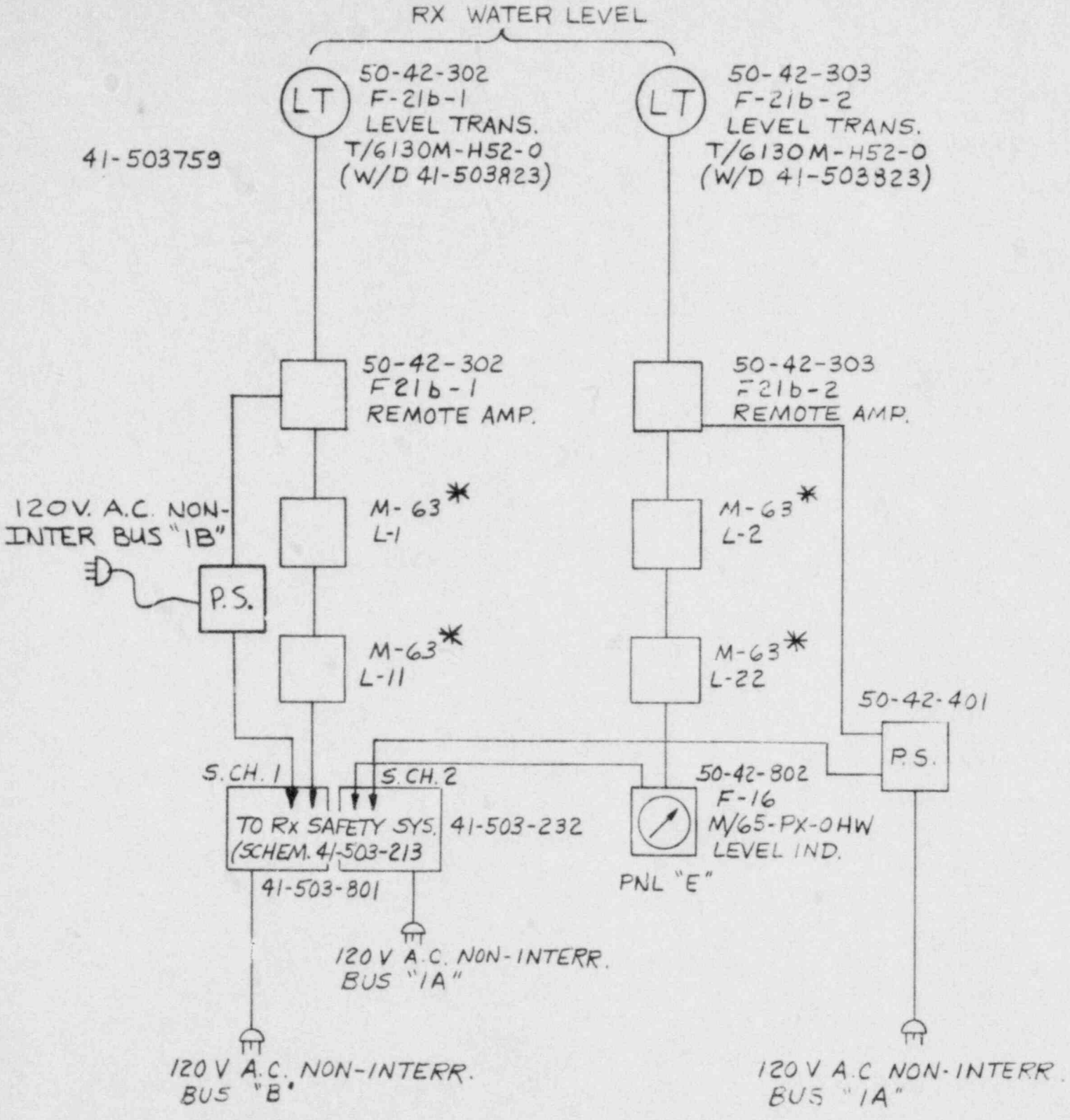

41-503757
LT
Rx WATER LEVEL #3
50-42-306
REMOTE AMPL.
50-42-302A
POWER SUPPLY
50-42-403
M-63 REL.
50-42-712
M-63 *
L-33
50-42-811
INDICATOR
Rx STEAM
TO TURBINE
41-503758
PT
64-35-302
B-54a-1
PRESS. TRANS.
T/611GM-DS2-0
0-1600 PSI
(W/D 503823)
REAR
PNL "E"
64-35-302
B-54a-1
REMOTE AMP.
M-63 *
P-2
P.S.
M-63 *
P-22
TO Rx SAFETY
SYSTEM
(SCHEM
41-503-213)
PNL
"E"
INDICATING
RCVR.
M/65 PX-0HW
64-35-802
(B-54-1)
*PROPOSED MODIFICATION

FIGURE 3



* PROPOSED MODIFICATION

FIGURE 4

M63 RELAYS		CIRCUIT 1	CIRCUIT 2
Reactor Water Level	#1	L_1	L_{11}
	#2	L_2	L_{22}
	#3	L_3	L_{33}
Reactor Pressure	#1	P_1	P_{11}
	#2	P_2	P_{22}
	#3	P_3	P_{33}

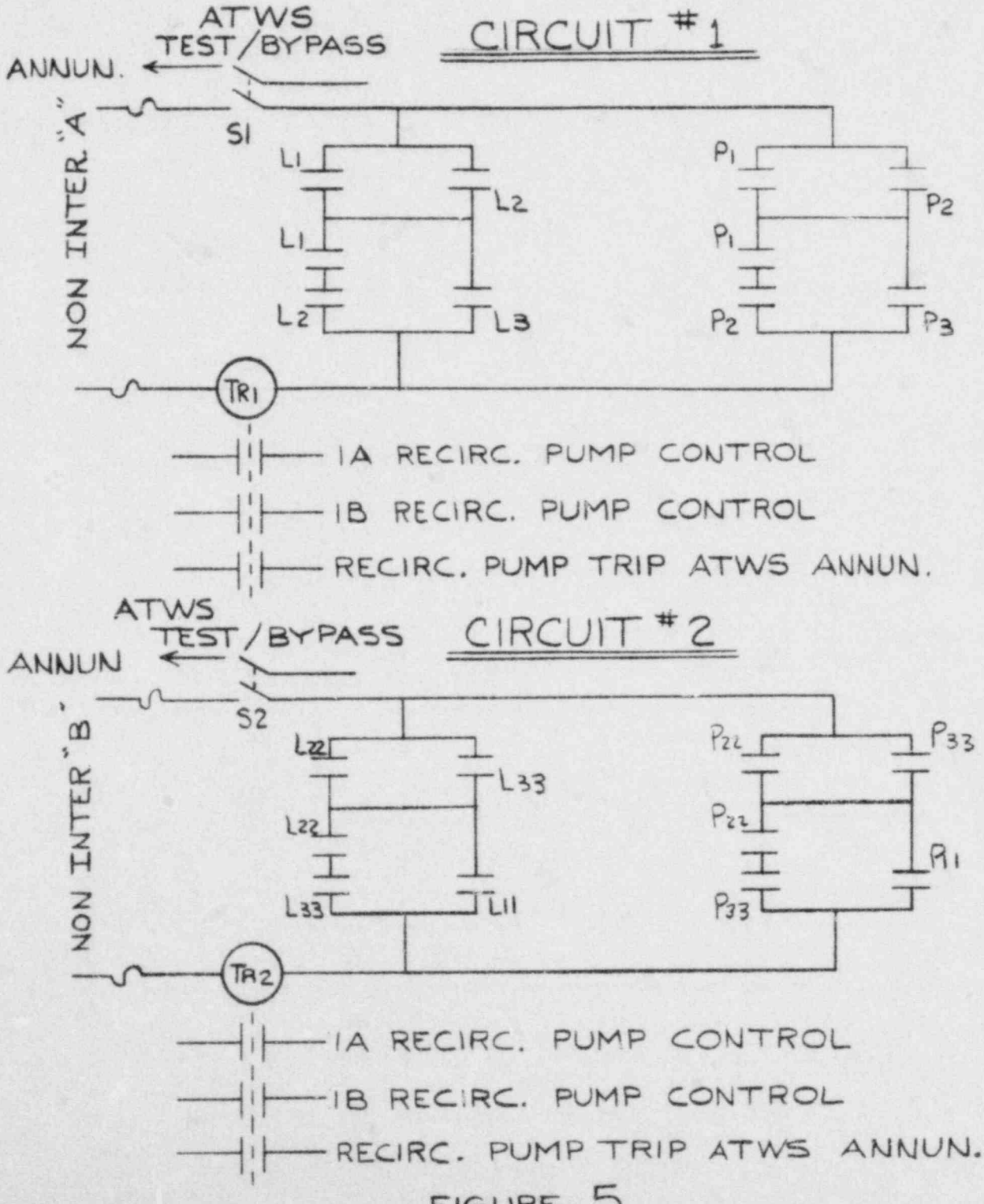
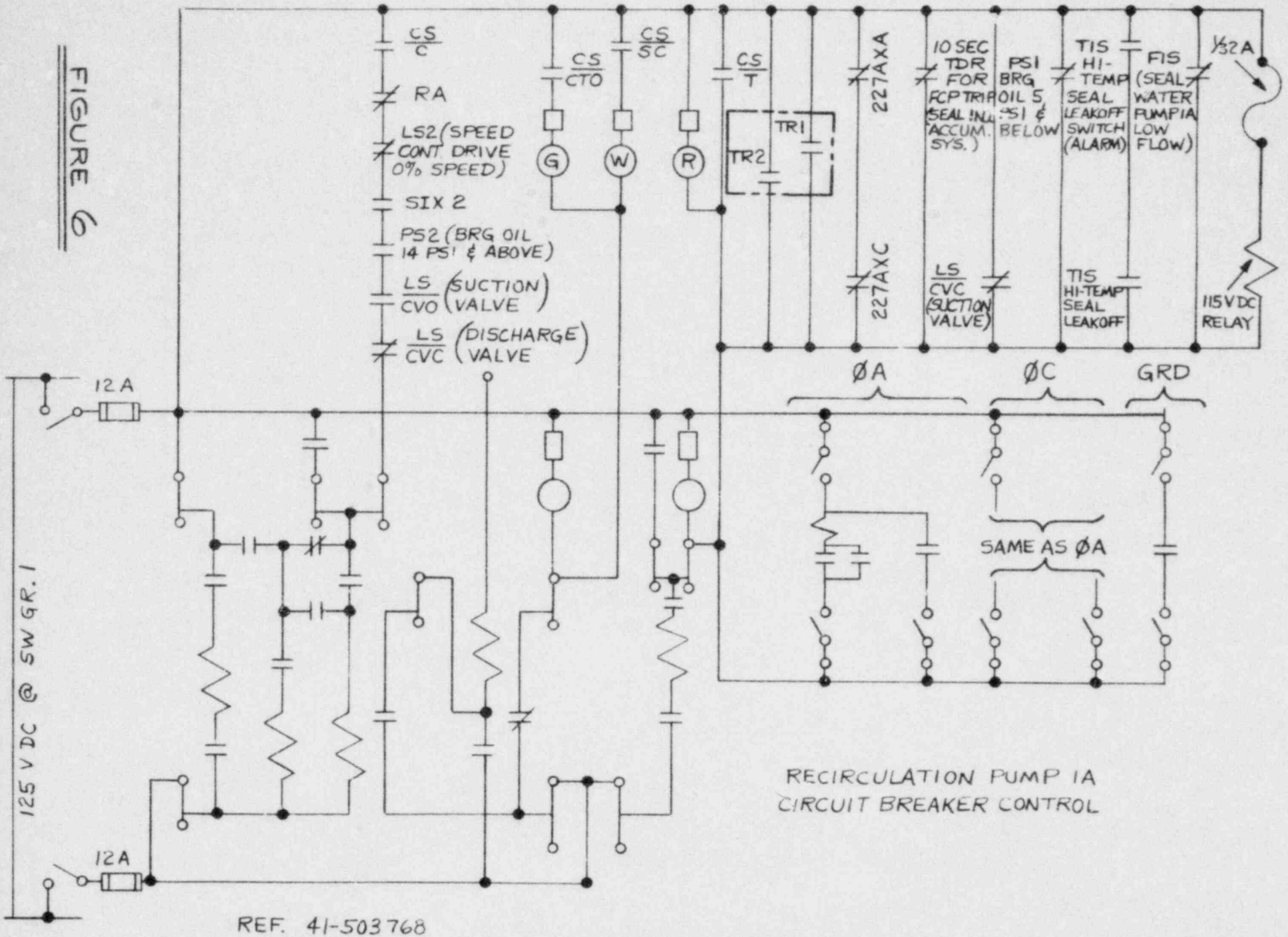


FIGURE 5

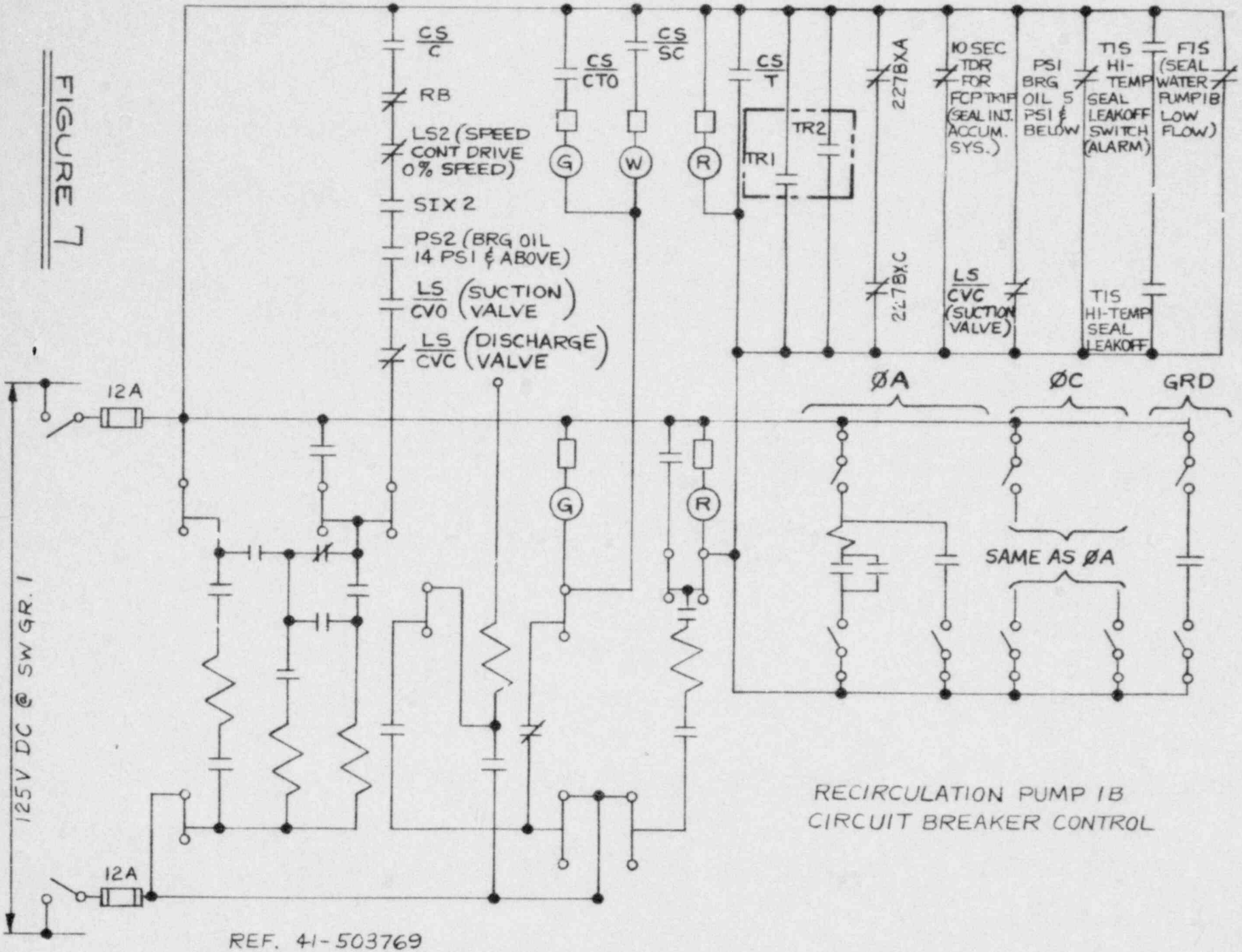
FIGURE 6



RECIRCULATION PUMP 1A
CIRCUIT BREAKER CONTROL

REF. 41-503768

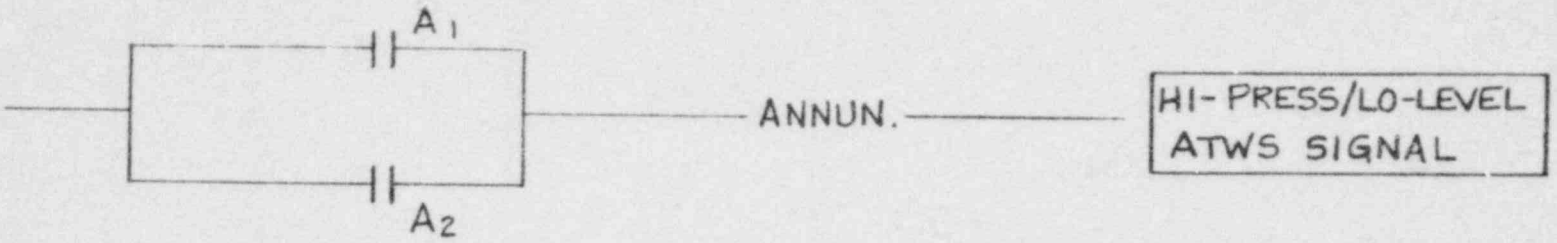
FIGURE 7



REF. 41-503769

RECIRCULATION PUMP 1B
CIRCUIT BREAKER CONTROL

ANNUNCIATOR FOR HI-PRESS/LO-LEVEL ATWS SIGNAL



SWITCH DEVELOPMENT

SW1	BYPASS 1	BYPASS 2	OPERATION
2			X
4	X	X	
5		X	
6		X	X
7	X		

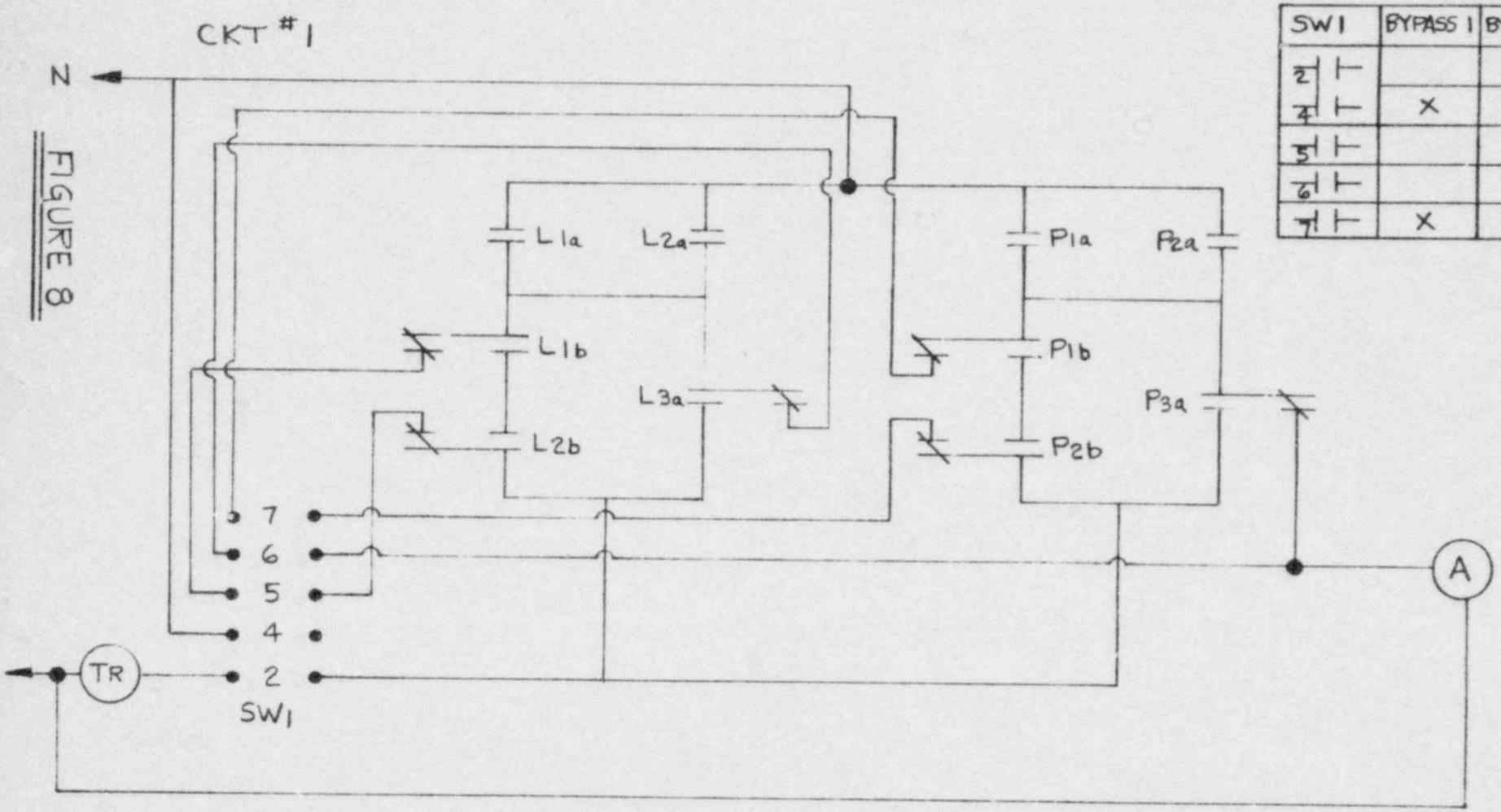


FIGURE 8

TYPICAL ANNUNCIATOR CIRCUIT