TOLEDO EDISON

RICHARD P. CROUSE
Vice President
Nuclear
(419) 259-5221

Docket No. 50-346

License No. NPF-3

Serial No. 856

December 10, 1982

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch #4
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Stolz:

As committed to in our letter to you (Serial No. 760) dated November 24, 1981, this letter serves to provide the conceptual design and the installation schedule for the Hot Leg Level Monitoring System (HLLMS) for the Davis-Besse Nuclear Power Station Unit ' ner NUREG-0737 item II.F.2.3. The attachment to this letter provides the conceptual design (consisting of the design criteria and functional description) for this system. Our present schedule calls for installation of this system during a refueling outage of sufficient duration one year following your approval of the attached conceptual design.

Very truly yours,

RPC:LCS:SCJ
Attachment

pk d/4
cc: DB-1 Resident NRC Inspector

A046

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ATTACHMENT TO TOLEDO EDISON LETTER

ON HOT LEG LEVEL MONITORING SYSTEM CONCEPTUAL DESIGN

To comply with NUREG-0737 Item II.F.2.3, Toledo Edison has completed the conceptual design of a hot leg level monitoring system (HLLMS). This system uses a differential pressure measurement across each hot leg. A detailed schematic of the system is enclosed herewith.

Design Criteria

As shown in the schematic, the HLLMS has one differential pressure transmitter per reactor coolant hot leg. The transmitters are spatially separated and the sensing lines for each hot leg pipe are routed within the respective steam generator compartment and, as such, physically separated. The lower tap for each transmitter is common.

The HLLMS will be designed to meet the separation requirements for Class IE equipment for the electrical portion up to and including the isolation device interfacing with the station computer. Power for the IE portion will be provided for each channel of this system via the Class IE essential instrument power sources. The HLLMS will be designed to ASME Section III Class 2 requirements for the sensing line portion up to and including the last shut off valve of the instrument.

The IE portion of the HLLMS will be designed to meet the separation requirements of IEEE-279-1971. The Class IE components of the system will be designed to meet the environmental qualification requirements of IEEE-323-1974. Seismic qualifications requirements of IEEE-344-1975 will also apply to the IE portions of this system.

Functional Description

The water level in each hot leg is determined by measuring the differential pressure between the top and bottom of the hot leg and compensating for the density of water in the hot leg and reference leg. The density is calculated by the station computer utilizing the RCS pressure, RCS temperature and the reference leg temperature.

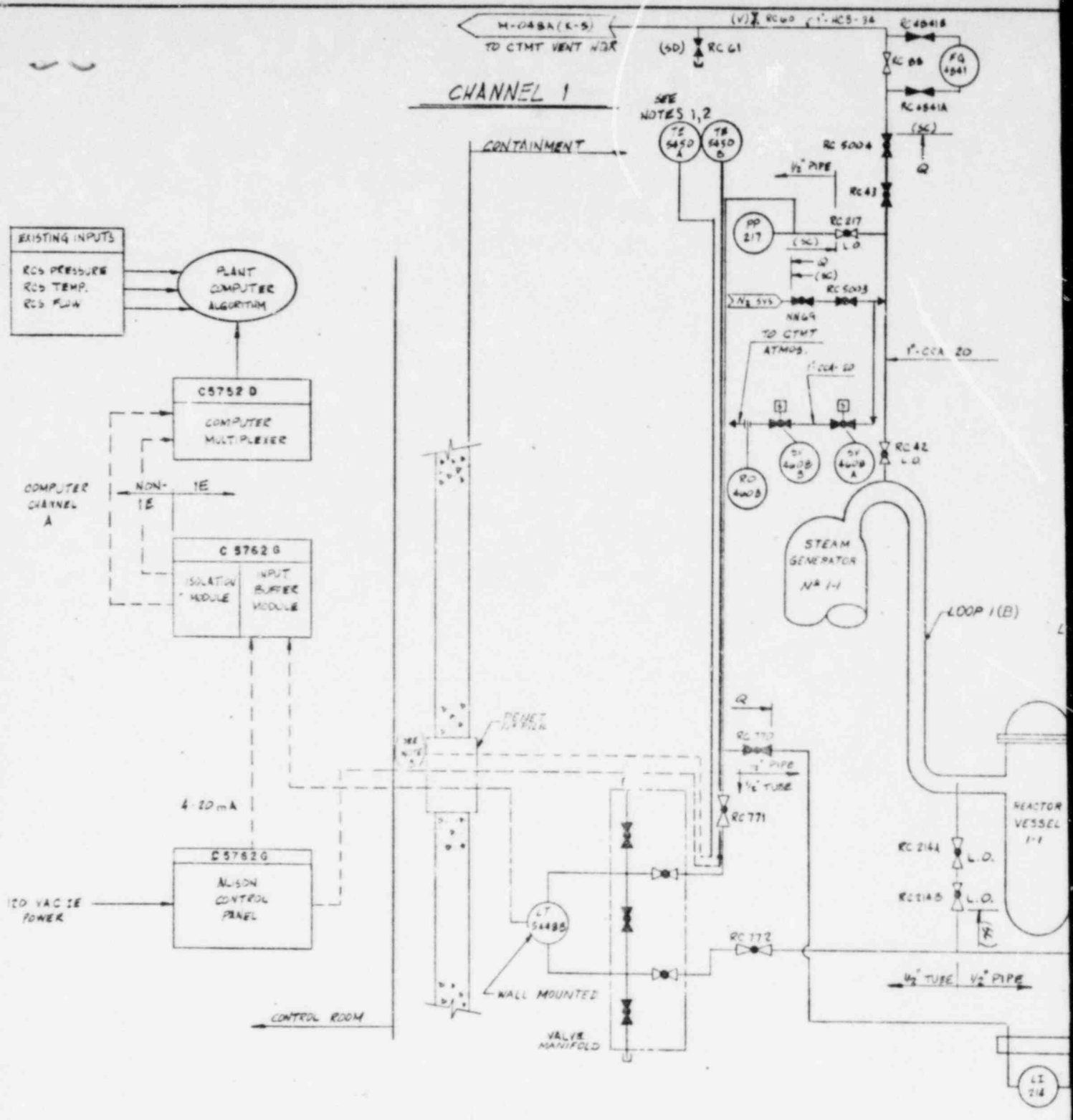
Rosemount 1153 HD6 transmitters (pressure range of 0-100 psid with 4-20 mA output) will be utilized to measure the differential pressure between the upper tap reference leg (at Steam Generator Inlet) and the lower tap (Hot Leg at Reactor Outlet). The reference leg impulse line will be connected

to an existing 1.0 inch RCS high point vent line (1" CCA-20; 1" CCA-21). The lower tap impulse line (variable leg) will be connected to an existing 3/4 inch sensing line. This lower tap will be common to both hot leg level monitoring transmitters.

Temperature compensation will be provided to allow for changes in the instrument reference leg fluid density resulting from variations in containment ambient temperature. This will be accomplished by utilizing a thermister attached to each reference leg.

The thermister wire tracks the entire vertical length of the instrument reference leg. This sensor will provide an average temperature signal which is converted to 4-20 mA within the thermister control panel located outside containment. Subsequently, the signal will be transmitted directly to the multiplexer cabinet for A/D conversion prior to transmitting it to the plant computer. A class IE power source (120 VAC) for the thermister will be provided. This configuration will exist for each channel.

The HLLMS will monitor hot leg water level during natural circulation or during periods when natural circulation is interrupted. No output display will be available when one or more reactor coolant pumps are running.



NOTES:

(1) TE-5449A TE-5449B, TE-5450A & TE-5450B, ARE THERMISTOR WIRES WHICH TRACK THE ENTIRE VERTICAL LENGTH OF INSTRUMENT REFERENCE LEG FOR TEMPERATURE COMPENSATION

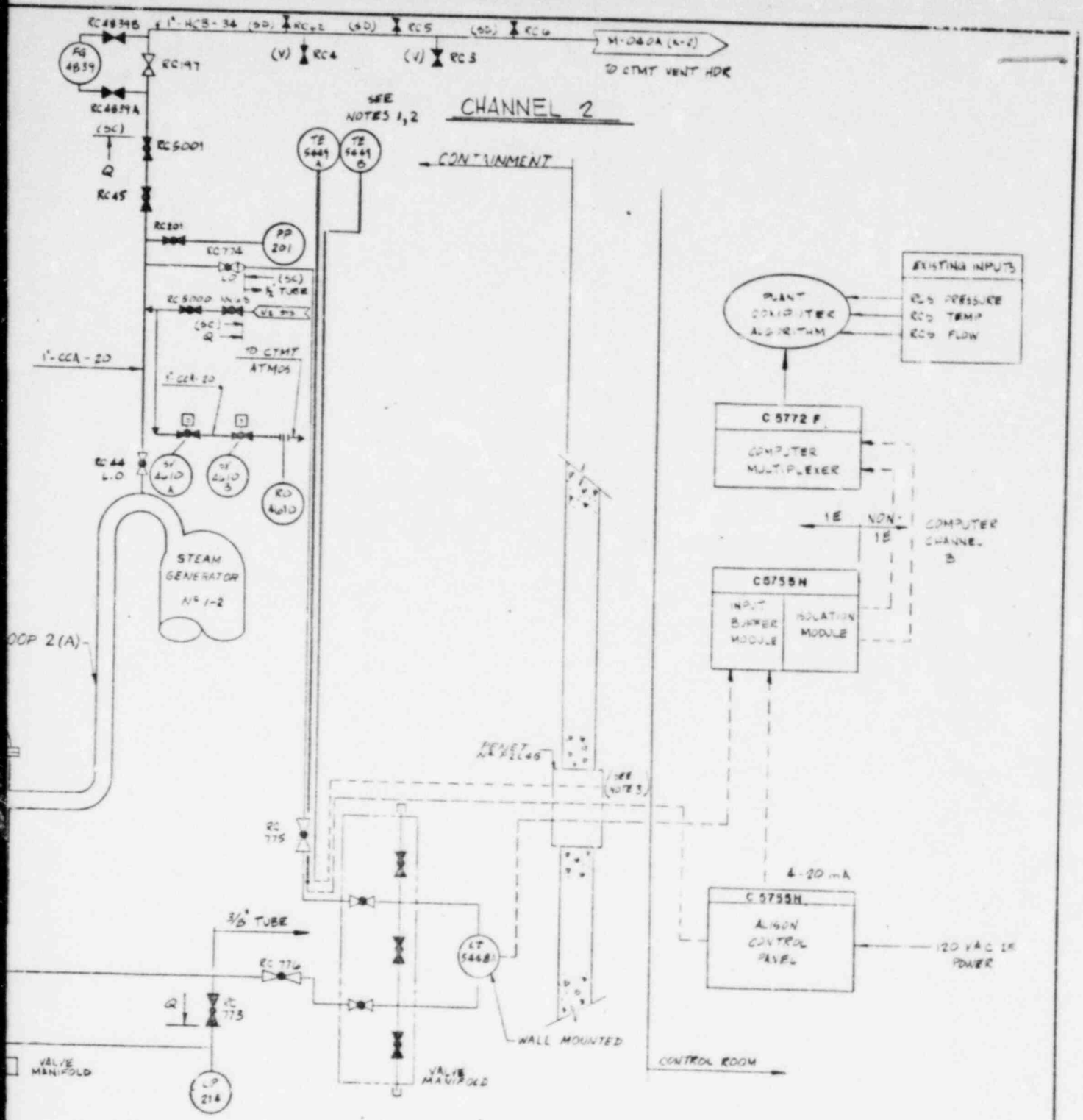
(2) TE-5449B & TE 5450B ARE SPARE THERMISTORS

(3) THE SPARE THERMISTOR WIRES ARE TERMINATED AT OUTSIDE OF PENETRATION TO ENABLE CONNECTION IN THE EVENT OF MAIN THERMISTOR FAILURE.

REFERENCES DRAWINGS:

DCN NO MD30-20

P&ID NO. MD30 REV. 28



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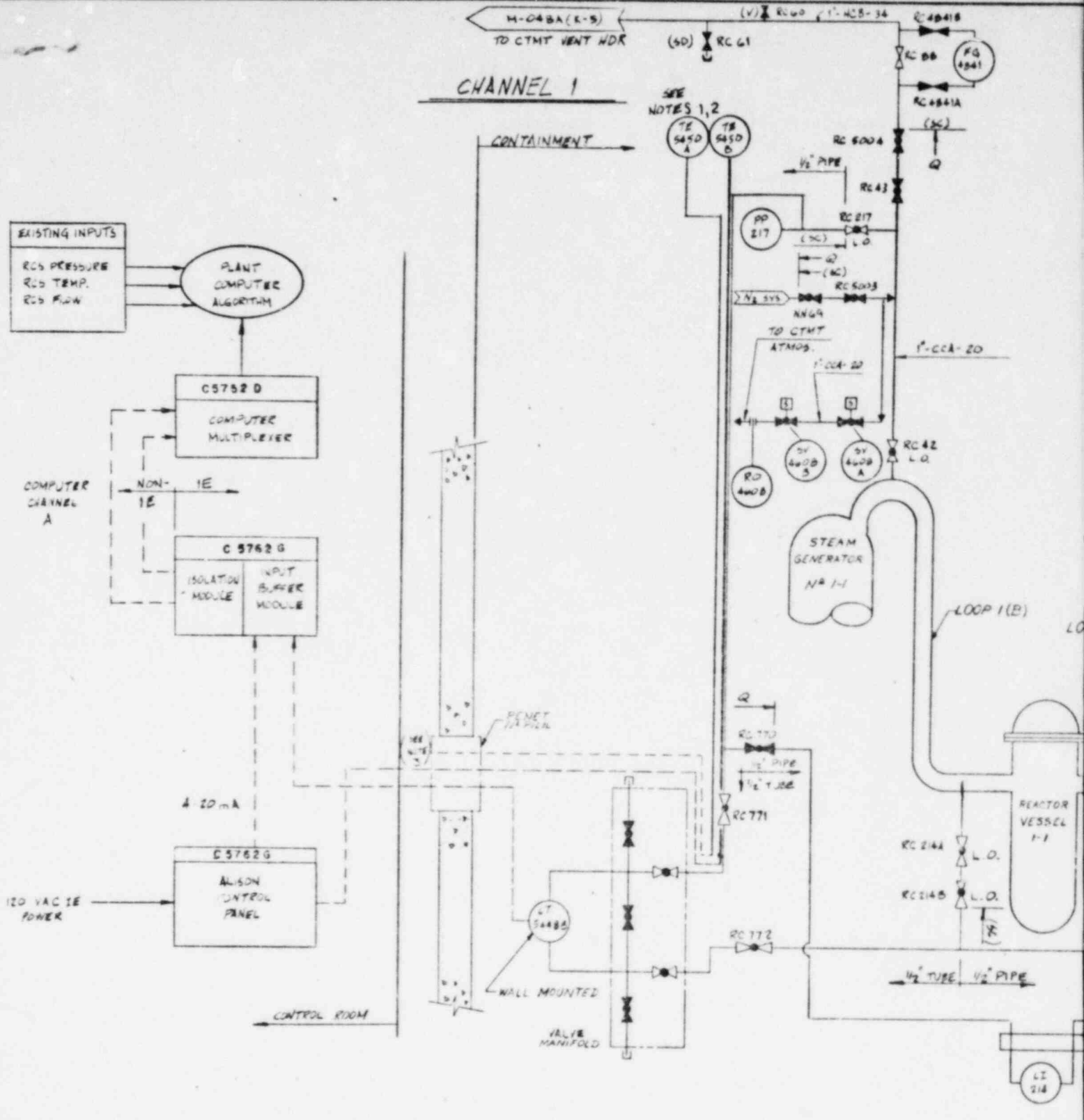
THE TOLEDO EDISON COMPANY
DAVIS BESSE NUCLEAR POWER STATION UNIT-1
SCHEMATIC DIAGRAM
HOT LEG LEVEL MONITORING SYSTEM

eds nuclear	DRAWN	CHECKED	APPROVED	DATE
	BA	JAD	JWC	9/19/80
JOB NO. 1040-006-671	DRAWING NO. 1040-006-002			REV. NO. 1

SHEET 1 OF 1



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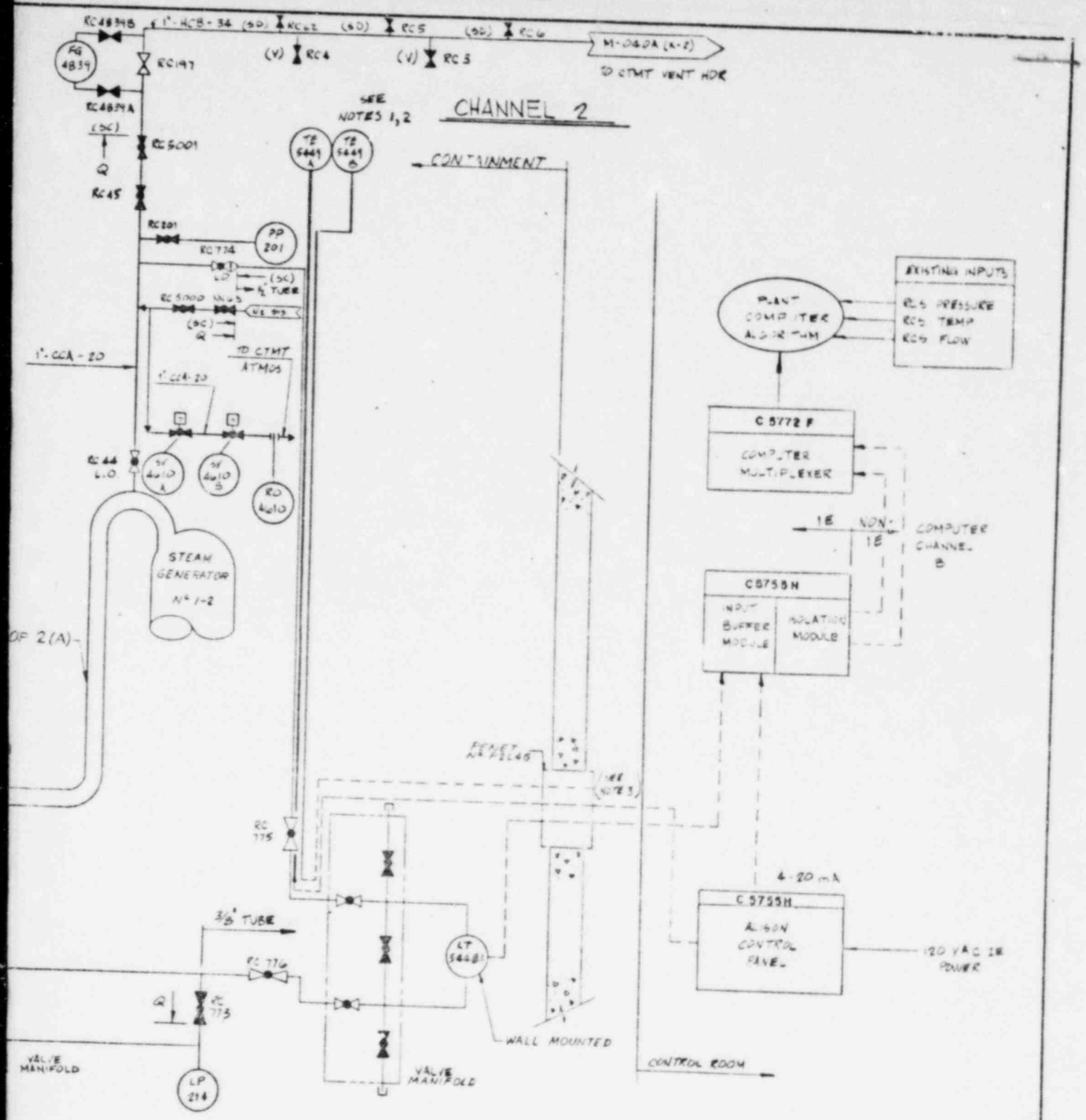

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SCHEMATIC DIAGRAM
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SCALE	DRAWN	CHECKED	APPROVED	DATE
—	BA			9/22/82

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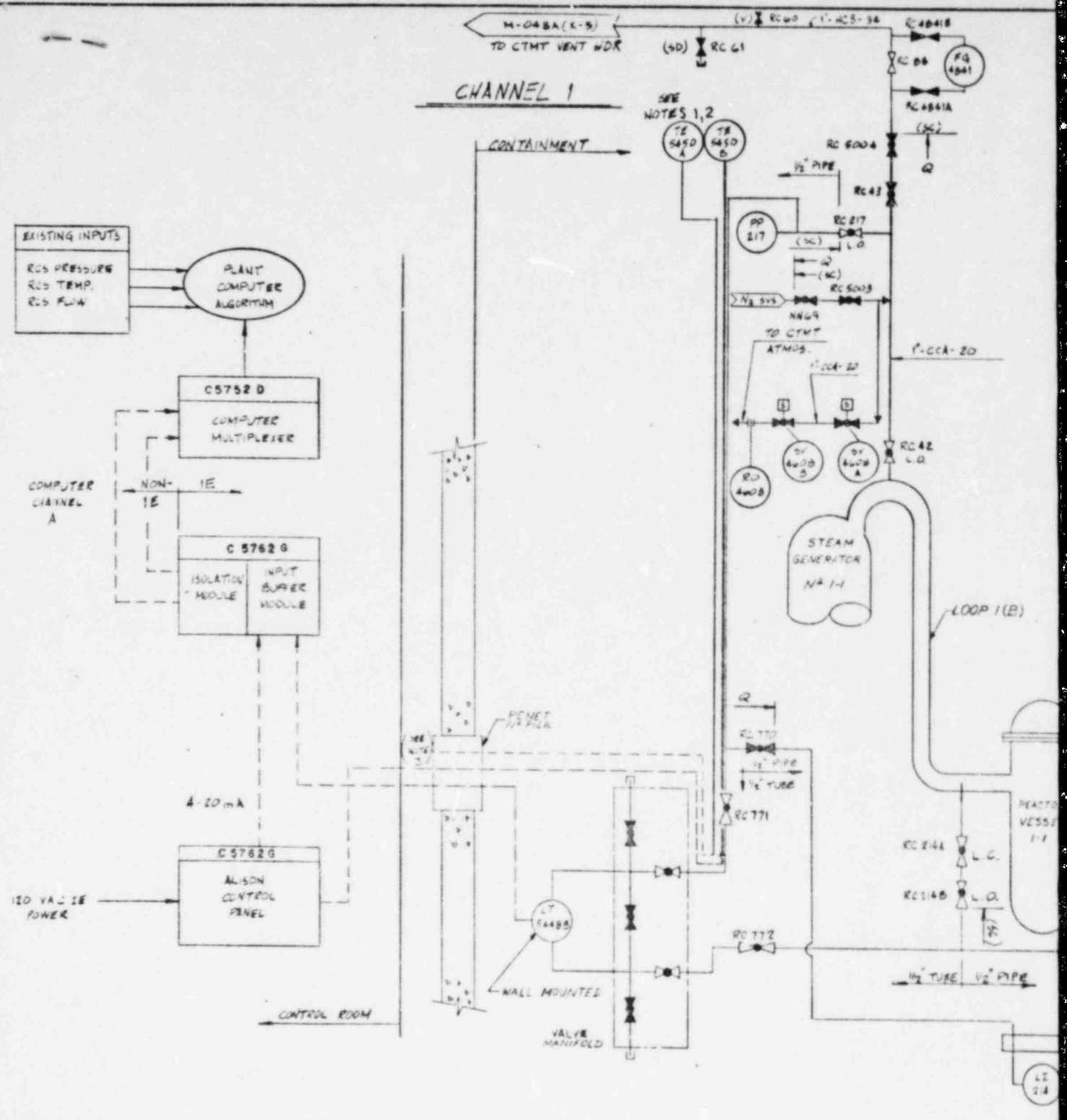
1040-006-671	1040-006-002	1



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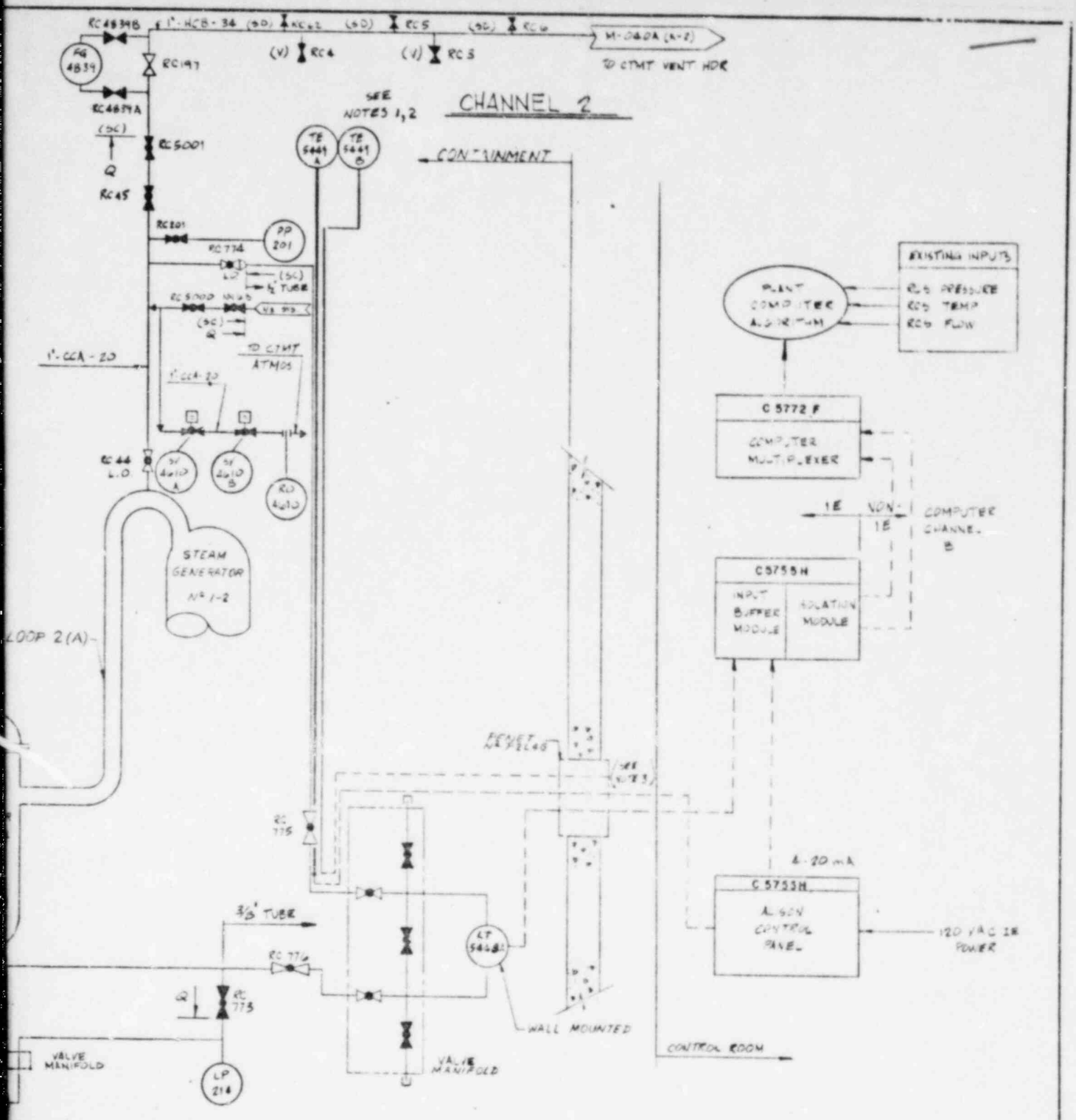

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THE TOLEDO EDISON COMPANY
DAVIS BESSE NUCLEAR POWER STATION UNIT-1

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HOT LEG LEVEL MONITORING SYSTEM

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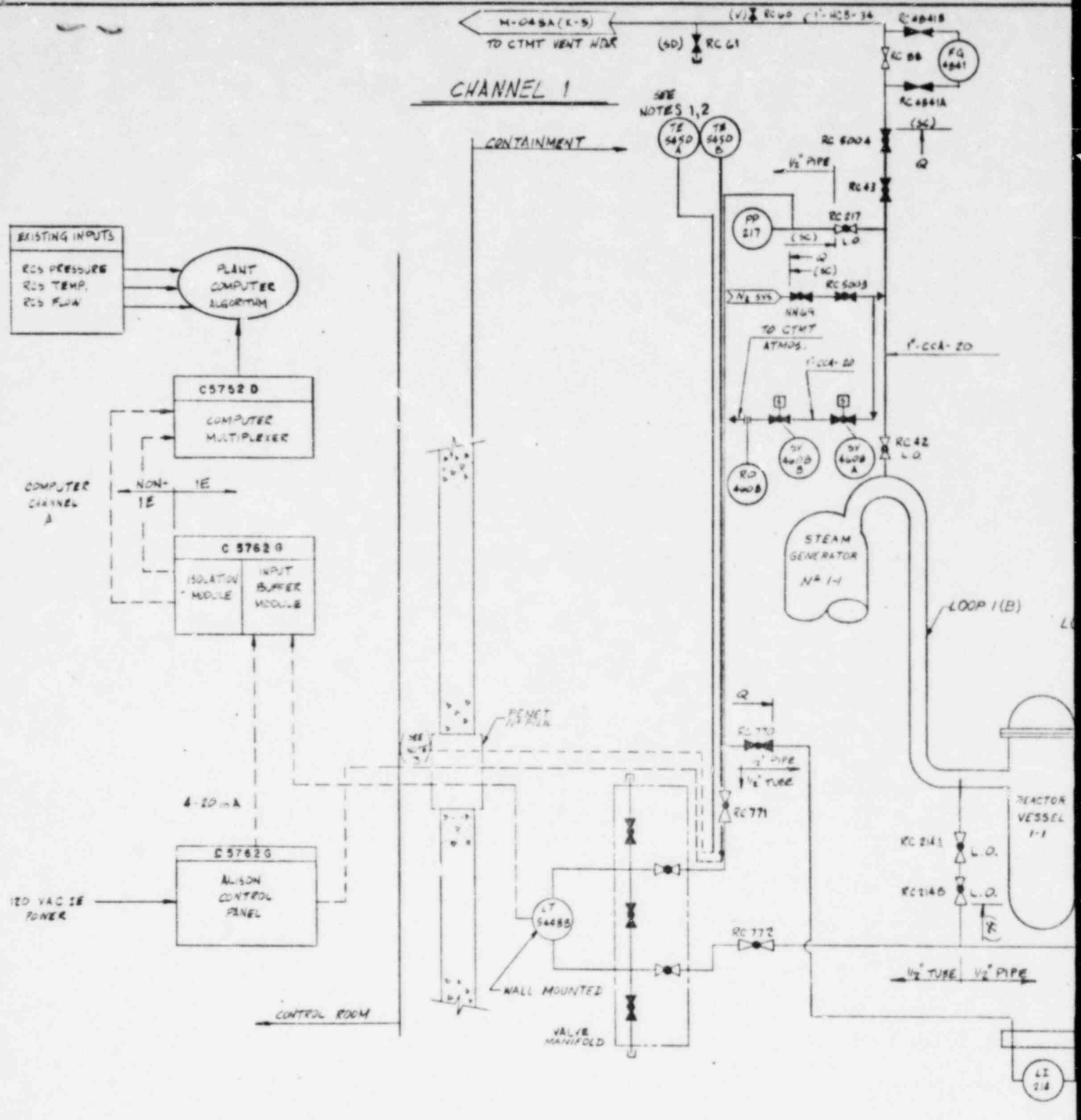

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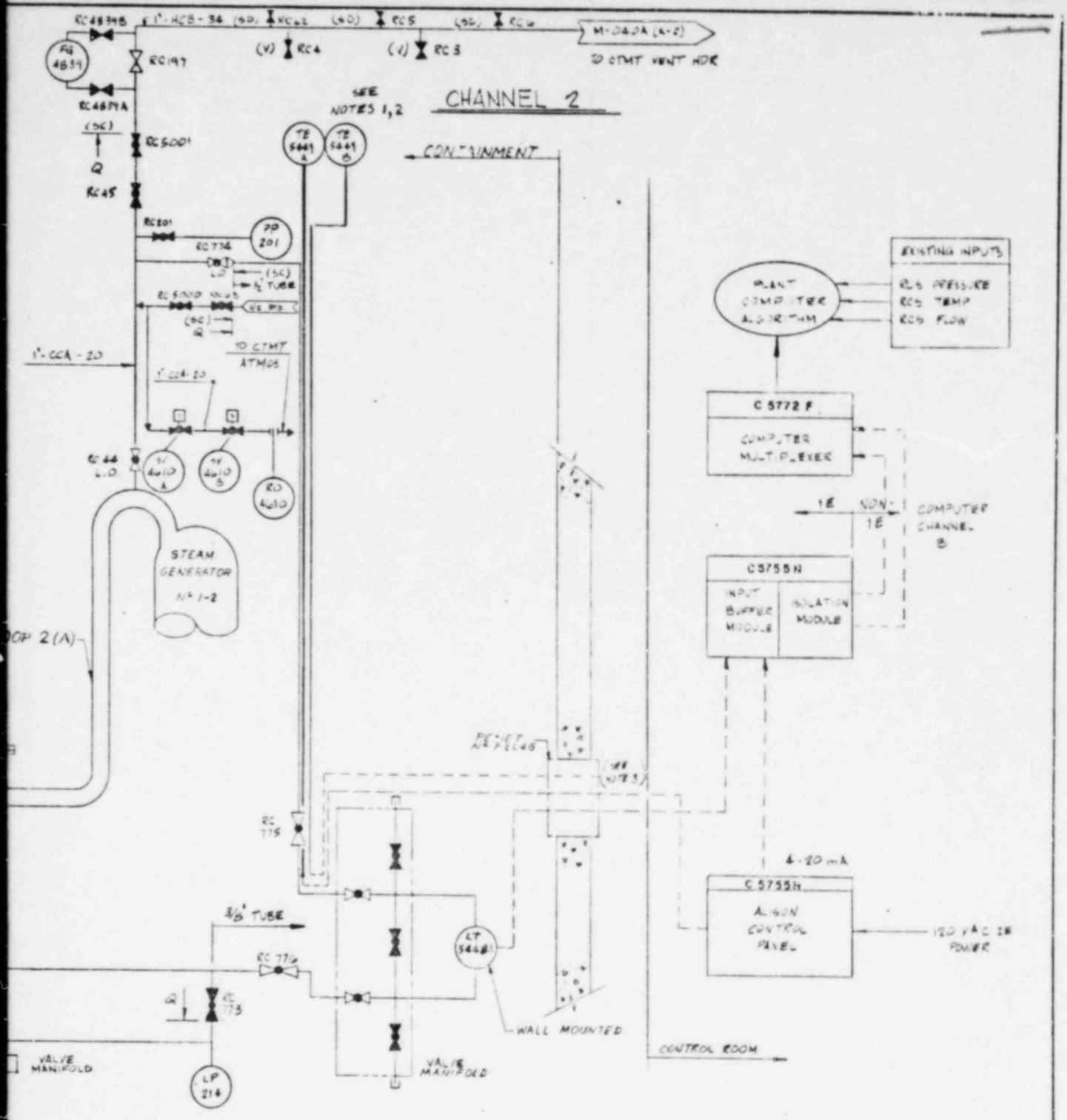

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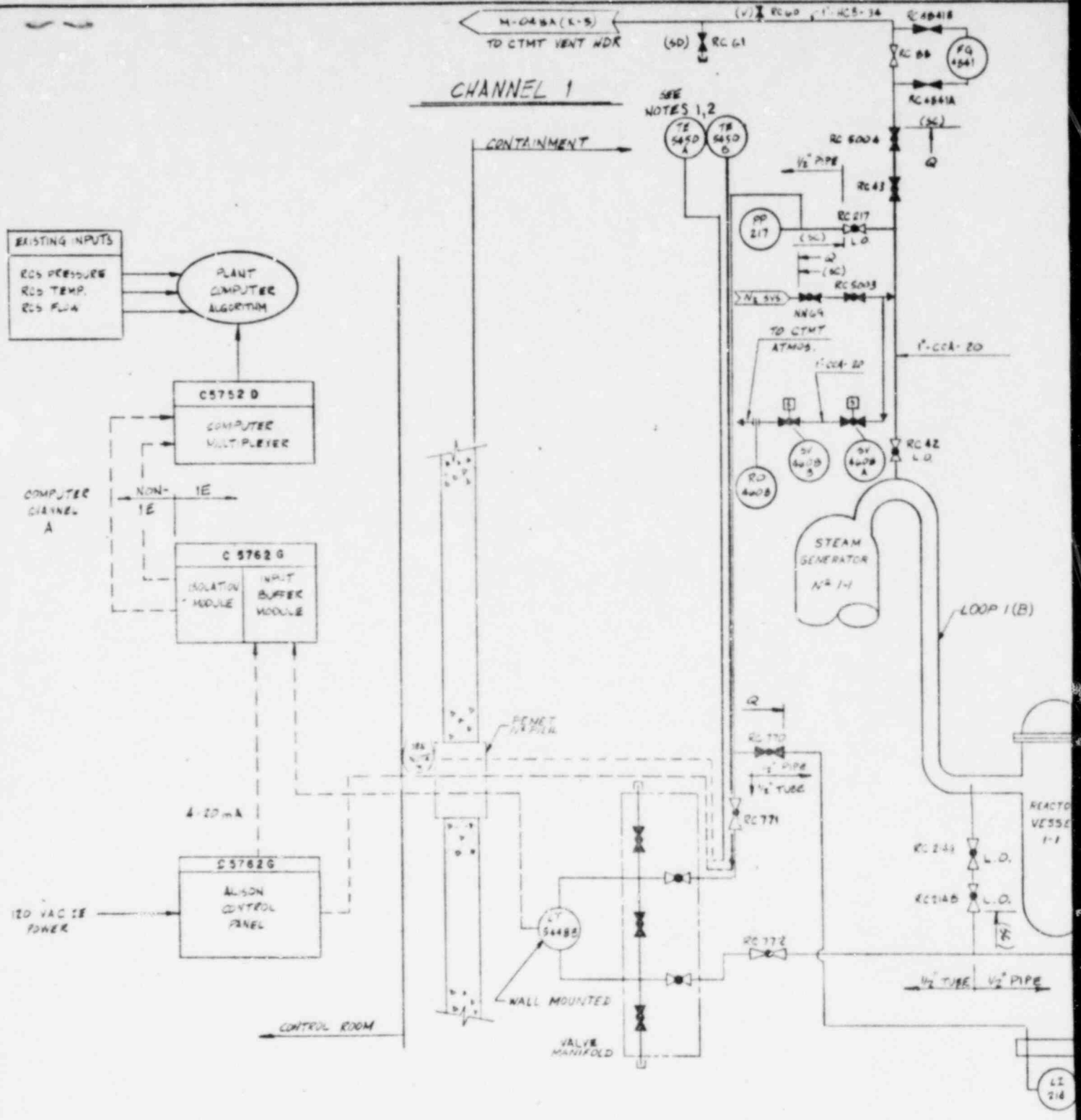

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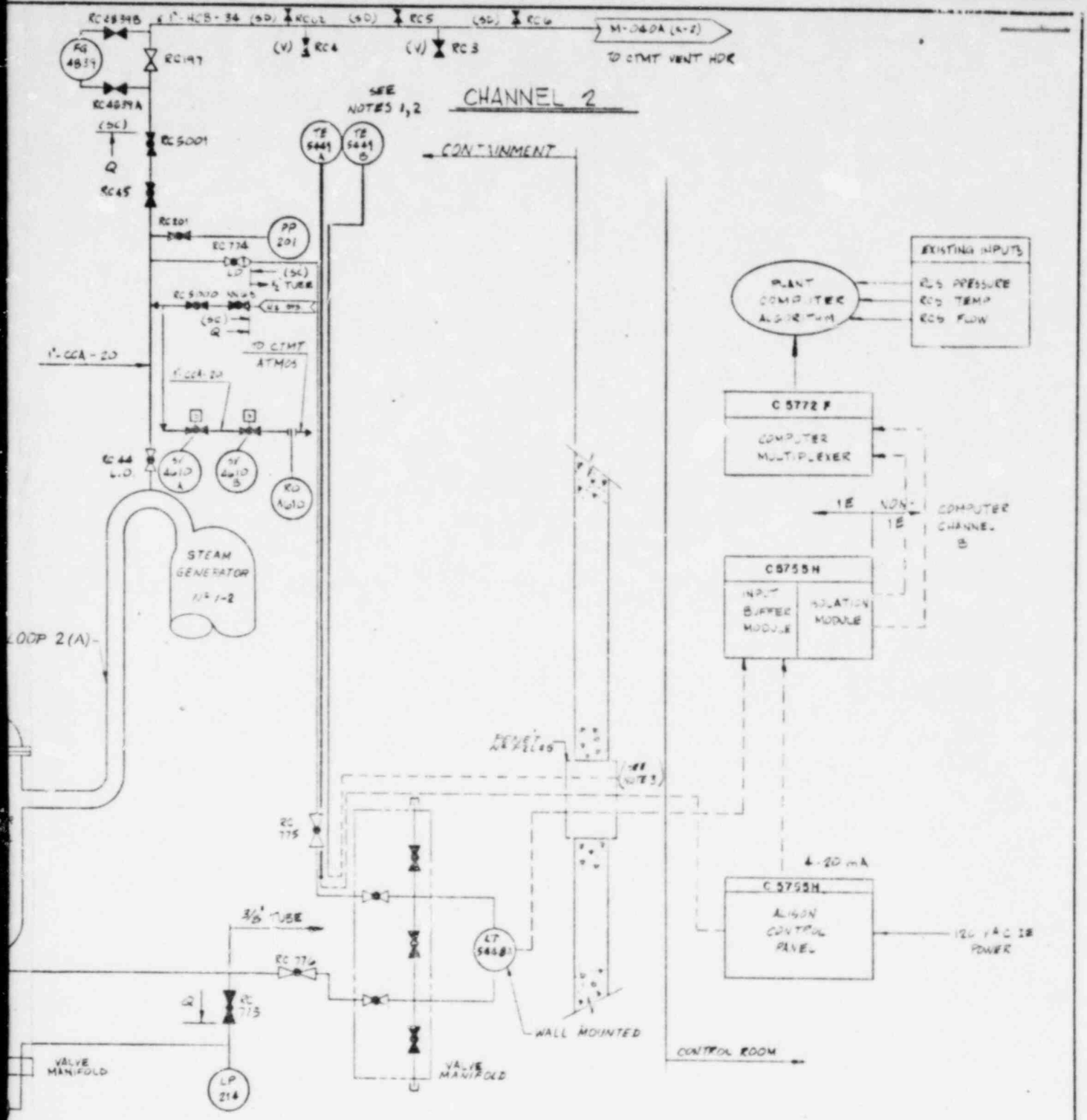

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