

50-289

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REACTOR VESSEL OVERPRESSURIZATION
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METROPOLITAN EDISON COMPANY

SUBSIDIARY OF GENERAL PUBLIC UTILITIES CORPORATION

POST OFFICE BOX 542 READING, PENNSYLVANIA 19603

TELEPHONE 215 - 929-3601

January 13, 1978
GQL 0049

Director of Nuclear Reactor Regulation
Attn: R. W. Reid, Chief
Operating Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Dear Sir:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Docket No. 50-289
Operating License No. DPR-50
Overpressure Protection System

Your letter of November 11, 1977, stated that the overpressure protection system for TMI-1 currently installed in combination with the proposed changes does not meet all the criteria established by the NRC, and that additional information and proposed Technical Specifications should be submitted by December 29, 1977.

In an attempt to understand your concerns and to clarify portions of our March 22, 1977, submittal, members of my staff met with members of your staff via telecon on December 15 and 22, 1977. As a result of these telecons, Met-Ed agreed to submit the various options considered with an evaluation of each option where appropriate, as well as the additional information requested, by January 15, 1978. The following responses are hereby submitted:

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I. OPTIONS EVALUATED FOR OVERPRESSURE PROTECTION*

A. Decay Heat Removal System (Re: GAI Dwg. C-302-640/TMI-1 FSAR Fig. 9-10)

The decay heat removal system as presently installed has no capability to protect the RCS from an overpressurization transient. Of the system piping available the 10" discharge lines are checked against backflow by DH-V22A/B, and the 12" suction line is blocked by DH-V1 and DH-V2 which trip closed at a RCS pressure of 400 psig. Since the decay heat removal system was not designed for an RCS overpressurization, this option is not acceptable.

B. Makeup and Purification System (Re: GAI Dwg. C-302-661/ TMI-1 FSAR Fig. 9-3)

1. Install 4" manual block valves on each of the two (2) 4" discharge lines upstream of the motor operated HPI valves MU-V16A/B/C/D. This option would cost on the order of \$100,000 and could be scheduled for the 1980 refueling outage.
2. Install a 2 1/2" manual block valve with a relief valve on each of the four (4) 2 1/2" HPI lines, downstream of the motor operated HPI valves MU-V16A/B/C/D. This option would cost on the order of \$200,000 and could be scheduled for the 1980 refueling outage.
3. Lock closed MU-V77A/B such that with MU-PIB running (normal mode of operation), no HPI flow is available. This option is undesirable since it restricts operating flexibility in that MU-PIA cannot be placed in operation.
4. Install relief valves between the MU pumps and HPI valves. This option is not acceptable since the overpressure protection relief valve set points would necessarily be less than the normal system discharge head.
5. Limit the level in the Makeup Tank to 66". This option restricts flexibility in operations during normal plant cooldown, and is therefore undesirable.

*Assuming the following:

Initial Conditions - Normal charging flow via MU-V17

Normal letdown established

Occurrence - MU-V16 (A/B/C/D) opens

Failure - EM Relief Valve (RCR-V2) fails to open

- C. Pressurizer Modifications - Install an additional block and EM relief valve on top of the pressurizer. This option, if physically possible in the space limitations, would be expensive (approximately \$400,000), and would take on the order of 2 to 2 1/2 years to accomplish. Installation could probably be accomplished during an extended 1981 refueling outage.
- D. Performance of the following actions:
1. Assure the MU-V16A/B/C/D in closed position
 2. Open the MU-V16A/B/C/D breakers at $\leq 300^\circ\text{F}$ and ≤ 1500 psig
 3. Lock the breakers in the open position - Key controlled by shift supervisor.
 4. Lock the MU-V16A/B/C/D handwheels - Key controlled by shift supervisor.
 5. Limit the pressurizer level to $\leq 220"$

This option is the most desirable of the options discussed in that limited administrative and hardware changes are required. These changes could be implemented within a reasonably short period of time.

Met-Ed proposes to use option "D" above. The incredible scenerio which would have to occur to decrease the overpressure protection provided is as follows:

Assuming the initial conditions previously stated, an operator would have to procure the valve handwheel keys from the shift supervisor, unlock a handwheel and open the valve, or obtain the breaker keys from the shift supervisor, close a breaker, and start the motor operator to open the valve. These actions would be in violation of several procedures and would be carried out with the shift supervisor's knowledge.

II. Electrical Circuit and Logic Diagrams

The following electrical circuit and logic diagrams requested in your letter of November 11, 1977, are attached in order to facilitate your review:

<u>Dwg. No.</u>	<u>Description</u>
Bailey D556139D	- Aux. System, Digital Logic, Temp. Loop
Bailey D554568	- Aux. System, Analog Logic, Press. Loop Part 1
Bailey D554566G	- Aux. System, Analog Logic, Coolant Temp. Loop Part 2
Bailey D8032702K	- Aux. System, Det. Schematic, R.C. Part 2
Bailey D8032703G	- Aux. System, Det. Schematic, R.C. Part 3
Bailey D8032704J	- Aux. System, Det. Schematic, R.C. Part 4
GAI SS-209-069	- R.C. Pressurizer Pressure Switch RC3-PS8, Aux. Relay 63X/RC30PS8
GAI SS-209-034	- Pressurizer Electromatic Relief Vv. RC-RV2
GAI SS-208-426	- Pressurizer Relief Block Vv. RCV-2

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Also attached are the electrical elementary diagrams for the HPI equipment. These are,

<u>Dwg. No.</u>	<u>Description</u>
GAI SS-208-213	- Make-up Pump MU-PIA
GAI SS-208-214	- Make-up Pump MU-PIC
GAI SS-208-215	- Make-up Pump MU-PIB
GAI SS-208-216	- Make-up Pump MU-PIB
GAI SS-208-217	- Make-up Pump Scheme
GAI SS-208-442	- Emer. Make-up Valves MU-V16A/B/C/D

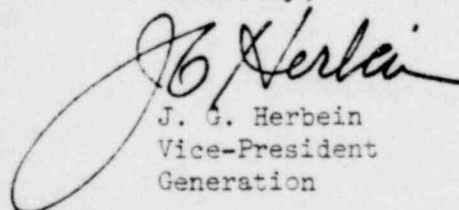
To assure proper alignment of the overpressure protection system during plant cooldown, your November 11, 1977, letter requires an enabling alarm which monitors the system enabling switch and the position of the isolation valve upstream of the PORV. Presently, the TMI-1 overpressure protection system enabling switch, NDTT switch, shown on GAI SS-209-069, has two positions, OFF or AUTO. In the OFF position, the overpressure protection system would be disabled (Re: Bailey Dwg. No. D556139D). The installation of an additional contact to the NDTT switch which will alarm whenever this switch is in the OFF position is being engineered. This alarm will be identified by "Pressurizer Electromatic Relief Valve Disabled". This modification will be completed by the end of the 1979 refueling outage.

The pressurizer relief block valve, RC-V2, presently has indicating lights (OPEN or CLOSED) on the Control Room panel for valve status. However, there is no alarm monitoring the status of this valve. The installation of an alarm for whenever RC-V2 is closed is being engineered. This alarm will annunciate as above, "Pressurizer Electromatic Relief Valve Disabled". This modification will be accomplished concurrent with the NDTT switch-alarm modification above.

III. Proposed Technical Specifications

Proposed Technical Specifications are under review by Met-Ed Technical Staff and Safety Committees, and should be submitted as formal Technical Specification Change Requests prior to the 1978 refueling outage. These proposed specifications include the conditions for removal of the Electromatic Relief Valve from service for testing and maintenance, and system enabling temperatures and Electromatic Relief Valve setpoints.

Sincerely,

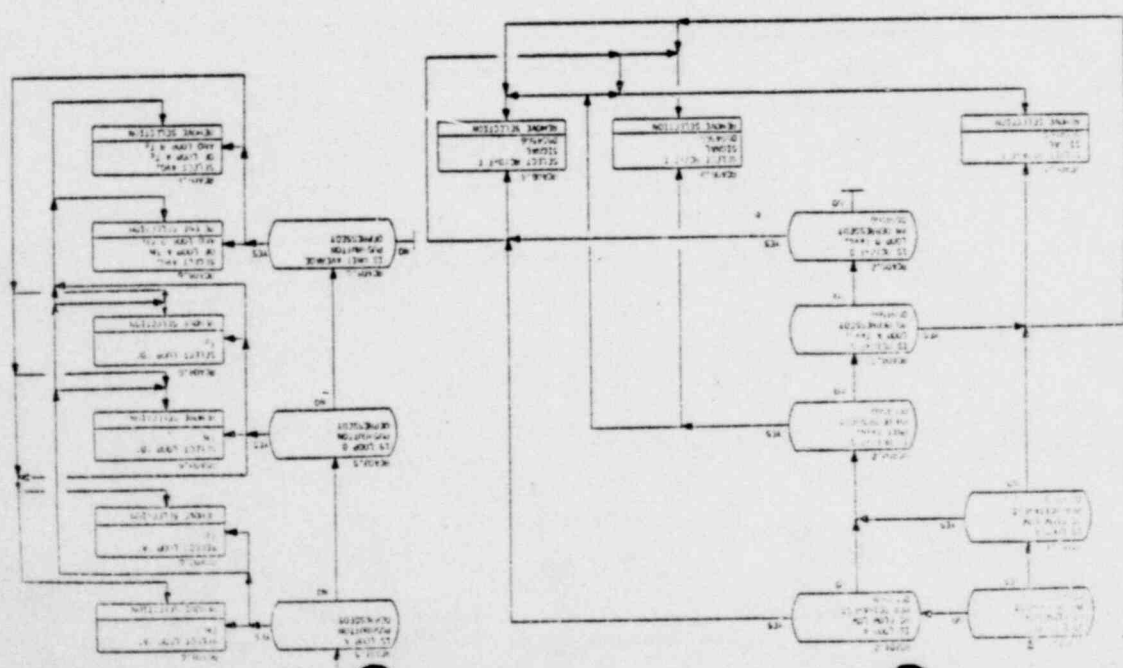
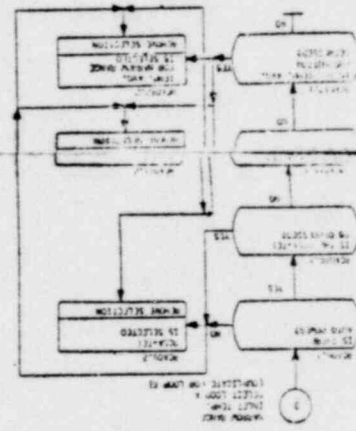
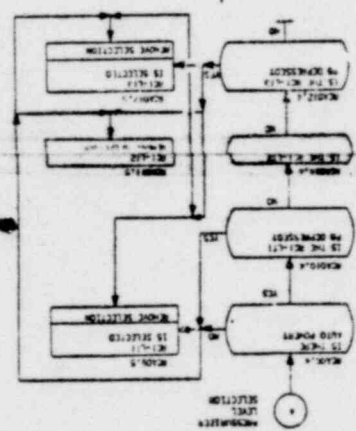
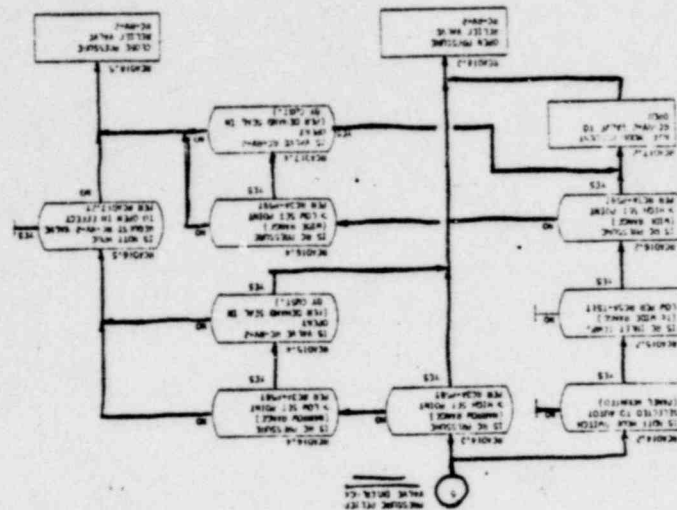

J. G. Herbein
Vice-President
Generation

JGH:RJS:jdp

Attachments

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