MAINE YANKEE ATOMIC POWER COMPANY

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B.3.2.1

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Office of Nuclear Reactor Regulation
Robert A. Clark, Branch Chief
Operating Reactor Branch No. 3

Reference: (a) License No. DPR 36 (Docket No. 50-309)
(b) USNRC Letter, D. G. Eisenhunt to all Licensee of Operating Plants, dated October 31, 1980
(c) NUREG 0737

Subject: Report on Overall Safety Effect of Power-Operated Relief Valve Isolation System

Dear Sir:

Reference (b) transmitted Reference (c) which includes all TMI-2 related items approved for implementation by the Commission as of October 31, 1980. Item II.K.3.2 of Reference (b) requested a report on the overall Safety Effect of Power-Operated Relief Valve Systems.

Maine Yankee has participated in CE Owners Group activities conducted since the Three Mile Island accident to address various aspects of PORV design and operation. The requirements of Item II.K.3.2 have been included in this activity.

Maine Yankee has concluded based on the CE Owners Group activities that the addition of an automatic PORV isolation system on the Maine Yankee plant to further decrease the probability of a small-break loss-of-coolant accident caused by a stuck-open PORV is not necessary. This conclusion is based on the following considerations. First, the design of the PORV actuation logic on the Maine Yankee plant is such that the valves are only actuated coincident with the high pressurizer pressure trip of the reactor. The PORVs are not used prior to the Reactor Protection System actuation in an attempt to avoid the reactor trip. Thus, challenges to the PORVs are reduced because the margin between the normal operating pressure and the high pressure reactor trip is maximized. The success of this design approach is evident based on the operating experience compiled to date which has only nineteen challenges to the PORVs in 29 reactor-years of operation on CE plants (data from a recent survey of the CE Owners Group). Note that eleven of these nineteen challenges were caused by a turbine runback feature which has been removed from the Maine Yankee Plant. The PORVs successfully reclosed in each case where they were challenged

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The second consideration for not needing an automatic PORV isolation system is that various actions already have been taken which significantly improve the reliability of the PORV's and associated block valves. The elimination of the turbine runback feature mentioned previously, and the provision of a reliable means for indicating PORV flow to the operator reduce the recurrence frequency of a small break LOCA due to PORV failure by an estimated factor of 15. Improved operator training programs, improved emergency procedures, and the provision of emergency power to the PORVs and block valves reduce the small break LOCA recurrence frequency further.

The third consideration for not needing an automatic PORV isolation system is that the recurrence frequency of a small break LOCA due to PORV failure has been substantially reduced by the actions mentioned previously to an estimated value which falls well within the uncertainty band of the recurrence frequencies for a LOCA due to a small pipe rupture estimated in WASH-1400. Thus, the recurrence frequency is now at an acceptably low value.

The final consideration which was not addressed by the owner's group were the disincentives for an automatic isolation system. Maine Yankee considers two potential problems with automatic isolation. First is that any failure of this system which would render the PORV's inoperable could provide an unnecessary challenge to the primary safety valves which do not have upsteam isolation. The second is that in the event of an underpressure/overpressure transient PORV isolation could degrade plant response and increase the likelihood of challenging the safety valves.

Maine Yankee has also reviewed the primary safety valve operating history and has found no openings of these valves for the Maine Yankee plant. A survey done as a CE Owners Group activity found no openings of the primary safety valves on other CE plants. As a CE Owners Group activity, the failure of the primary safety valves to close if they are challenged was estimated to be 1.24 X 10-3 per demand. This estimate is based on industry experience with main steam safety valves which are similar to the primary safety valves.

Based upon the above rationale, it is the judgement of Maine Yankee that an automatic isolation of the PORV's is not necessary or desirable and may not be in the interest of improved safety.

We trust the information provided herein is satisfactory. Should you have any further questions, please feel free to contact us.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

John B. Randazza

J. B. Randazza
Vice President, Operations

JBR/bjp