NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

May 23, 1988

Docket No. 50-423
A07138
Re: IEB 85-03

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Additional Information
IE Bulletin 85-03
MOV Common Mode Failures

In a letter dated June 11, 1986,(1) as supplemented by a letter dated October 28, 1986,(2) Northeast Nuclear Energy Company (NNECO) submitted to the NRC Staff a response to IE Bulletin 85-03,(3) providing certain information and detailing NNECO's program for addressing the NRC Staff concerns outlined in the Bulletin for Millstone Unit No. 3.

In a letter dated March 24, 1988,(4) the NRC Staff requested that NNECO provide auditional information to support the Staff review of NNECO's June 11, 1986 submittal. Accordingly, NNECO hereby provides the attached additional information.

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(1) J. F. Opeka letter to Dr. Thomas E. Murley, "IE Bulletin 85-03, MOV Common Mode Failures," dated June 11, 1986.

(2) J. F. Opeka letter to Dr. Thomas E. Murley, "IE Bulletin 85-03, MOV Common Mode Failures," dated October 28, 1986.

(3) IE Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings," dated November 15, 1985.

(4) L. H. Bettenhausen letter to E. J. Mroczka, "Additional Information on IEB 85-03," dated March 24, 1988.

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If you have any questions, please contact us.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

Attachment
cc: W. T. Russell, Region I Administrator
R. L. Ferguson, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3
Division of Operational Events Assessment, NRR
L. H. Bettenhausen, Chief, Projects Branch No. 3, Region I

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Attachment

Millstone Nuclear Power Station, Unit No. 3

Additional Information
IE Bulletin 85-03
MOV Common Mode Failures

May 1988

Millstone Unit No. 3
Additional Information
IEB 85-03 "MOV Common Mode Failures"

Question 1:

Has water hammer due to valve closure been considered in the determination of pressure differentials? If not, please explain.

Response:

Water hammer due to valve closure was not considered in the determination of pressure differentials. Valve opening and closing times for the MOVs evaluated range from 5-30 seconds. Water hammer is not of concern unless valve stroke times are much less than one second.

Question 2:

Unlisted MOVs 17A, 17B, and 17D are shown normally open in zones F-2, H-2, and C-2, respectively, of Figure 10.3-1, Sheet 1 of 5, Amendment 18, March 1986. They are located in the steam lines from the steam generators to the AFW Turbine, in series with normally closed pneumatic valves. As required by Action Item a of the bulletin, assume inadvertent equipment operations. How would steam flow to the AFW turbine be ensured if these MOVs were to be left closed inadvertently? Revise Attachment 4 of the response of 10/28/86 to include these MOVs, or justify their exclusion.

Response:

It is NNECO's position that IE Bulletin 85-03 does not apply to MOVs 17A, 17B, and 17D. IE Bulletin 85-03 identifies concerns regarding gate-type MOVs. MOVs 17A, B, and D are stop check valves (Walworth Drawing No. A-12279-M-3C) and are considered self-actuating in the Millstone Unit No. 3 In-Service Test Program. Motor operator thrust requirements for these valves are significantly less severe than for typical gate-type MOVs. Specifically, reverse flow in MOVs 17A, B, and D results in valve closure without any thrust required from the operator. Any differential pressure in the forward direction (i.e., valves inadvertently left closed) directly assists in valve opening. In fact, increased differential pressure in the forward direction provides increased assistance in opening these valves.

In summary, NNECO has excluded MOVs 17A, B, and D from our response to IEB 85-03 since characteristics of these stop check valves means that they are not subject to the type of failures identified in the bulletin.

Question 3:

The proposed program for Action Items b, c, and d of the bulletin is incomplete. Please provide the following details.

a. Commitment to a training program for setting switches and maintaining valve operators.

b. Commitment to justify continued operation if a valve is determined to be inoperable.

c. Description of a method for extrapolating valve stem thrust determined by testing at less than maximum differential pressure.

d. Justification of a possible alternative to testing at maximum differential pressure at the plant.

e. Consideration of applicable industry recommendations in the preparation of procedures to ensure maintenance of correct switch settings.

Response:

3a. NNECO currently has a training program for personnel who perform the maintenance of valve operators.

Personnel performing MOVATS data acquisition and valve analysis have completed training programs given by MOVATS. These programs cover switch setting and interpretation of test results.

3b. NNECO presently has procedures in place to deal with equipment declared inoperable. Justification for continued operation will be based upon an evaluation of the valve's effect on Technical Specifications or Design Basis requirements for system function.

3c. The conventional formula, as follows, will be used to extrapolate valve stem thrusts when measured at less than maximum differential pressures:

Valve Thrust (open) = K x DP [(Seat Area x Seat Coefficient) - Stem Area] + Stuffing Box Load

Valve Thrust (closed) = K x DP [(Seat Area x Seat Coefficient) + Stem Area] + Stuffing Box Load

This formula is based on obvious physical principles and is used in a similar form by Limitorque, MOVATS, and the valve manufacturers. The constants and the stuffing box load can only be determined

experimentally. These values can be determined from the static tests and tests at lower differential pressures. The formula can then be used to determine the stem thrusts required at the higher differential pressures.

3d. Signature testing (MOVATS or similar) is an acceptable alternative to full DP testing at the plant, especially for MOVs where DP testing is impractical. In the absence of full DP testing, original design thrust and running load requirements (verified by analysis or partial flow DP signature testing) can be ensured through static signature testing.

Many critical operational parameters can be measured through static signature testing, such as control switch trip thrust, running load, and bypass switch actuation. Adequate control of these parameters through signature testing can maintain proper MOV operation without the need for full DP testing.

3e. NNECO presently considers applicable industry recommendations in the preparation of procedures to ensure maintenance of correct switch settings.