NORTHEAST UTILITIES

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

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September 4, 1987
Docket No. 50-336
A06698
Re: IEB 85-03

Mr. Edward C. Wenzinger
Chief, Projects Branch No. 3
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Gentlemen:

Millstone Nuclear Power Station Unit No. 2
Additional Information
IE Bulletin 85-03
MOV Common Mode Failures

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

In a letter dated July 29, 1987 (3), the NRC Staff requested that NNECO provide additional information to support the Staff review of Reference (2). Accordingly, NNECO hereby provides the attached additional information.

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
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 2
T. Rebelowski, Resident Inspector, Millstone Unit Nos. 1 and 2
Document Control Desk, USNRC, Washington, D.C., 20555

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

(3) E. C. Wenzinger letter to E. J. Mroczka, "Request for Additional Information, IE Bulletin 85-03", dated July 29, 1987.

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ATTACHMENT
Millstone Nuclear Power Station, Unit No. 2

Additional Information
IE Bulletin 85-03
MOV Common Mode Failures

September, 1987

RESPONSE
REQUEST FOR ADDITIONAL INFORMATION
IEB 85-03 "MOV COMMON MODE FAILURES"

Question 1

Unlisted MOVs 2-SI-614, 624, 634 and 644 in discharge lines of the safety injection tank system are shown normally open (FL) on Drawing 25203-26015, Revision 18. The possible problem that the system would be inoperable if the MOVs were left closed inadvertently should be addressed. Based on the assumption of inadvertent equipment operations as required by Action Item "a" of the Bulletin, revise the table of the response of 06-11-86 to include these valves.

NNECO Response

It is NNECO's position that IE Bulletin 85-03 does not apply to MOVs 2-SI-614, 624, 634 and 644. These valves are part of the Safety Injection Tank (SIT) System and, thus, are considered low pressure valves.

The Bulletin applies to short term, high pressure safety systems. For Millstone Unit No. 2, this includes Auxiliary Feedwater, High Pressure Safety Injection and Chemical and Volume Control systems. The NRC Staff concurred with this position during a phone conversation on March 12, 1986 (with Mr. R. J. Kiessel of NRR).

Thus, it is NNECO's position that MOVs 2-SI-614, 624, 634 and 644 are not to be included in the scope of IE bulletin 85-03.

However, NNECO is providing the requested information for informational purposes only:

1. Valve - 2-SI-614, 624, 634 and 644
2. Valve Function - SIT outlet valves
3. Normal Event, Maximum Differential Pressure Open/Close - 250 psi/0 psi
4. Abnormal Event, Maximum Differential Pressure Open/Close - 185 psi/0 psi
5. Specified Differential Pressure -350 psi

The Normal Events considered included 1) closure of the MOVs during normal plant cooldown evolutions and 2) opening the MOVs during normal plant startup evolutions.

The Abnormal Events considered included 1) failure of the injection loop check valves (2-SI-217, 227, 237 and 247) and 2) inadvertent operation of the MOVs during plant operation and plant shutdown.

In all cases, single failures were assumed as described in NNECO's original response to IE Bulletin 85-03 (June 11, 1986).

The above question raised a specific concern regarding the MOVs being left closed during plant startup. NNECO evaluated this case and has determined the

scenario to yield acceptable results based on the following: The injection loop check valves provide a barrier to the RCS, thus, maximum delta-P on the SIT outlet MOVs would be 250 psi (maximum SIT pressure) which is below the specified delta-P of 350 psi. If the injection loop check valves are assumed to leak, the header downstream of the SIT MOVs could be pressurized to RCS conditions which could exceed the specified Delta-P of the MOVs (350 psig). However, in this case, the operator could relieve the pressure in the injection header via the safety injection pump test line (2"-GCB-14). This would depressurize the injection header to allow for the SIT outlet MOVs to be opened, returning them to their normal position.

To summarize, IE Bulletin 85-03 does not apply to MOVs 2-SI-614, 624, 634 and 644. However, to expedite the resolution of Action Item "a", maximum expected differential pressures are hereby provided and compared to the Specified Differential pressure for the MOVs. Based on the above discussion, it is concluded that MOVs 2-SI-614, 624, 634 and 644 have been adequately specified to accommodate their respective design basis.

Question 2

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

NNECO 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 10 to 30 seconds. Water hammer is not of concern unless stroke times are much less than 1 second.

Question 3

Please expand the proposed program for action items b, c, and d of the Bulletin to include the following details as a minimum:

(a) Commitment to a training program for setting switches, maintaining valve operators, using test equipment and interpreting test results,

(b) Commitment to justify continued operation of a valve determined to be inoperable, and

(c) Description of a method possibly needed to extrapolate valve stem thrust measured at less than maximum differential pressure.

NNECO Response

3a Millstone Unit No. 2 currently has a training program for personnel who perform the maintenance of valve operators. Personnel performing MOVATS data acquisition do not attend this training since they will set switches (including torque switch spring preload adjustments) only. It is our opinion that switch setting training is not required for these people since the signature analysis will determine if the switches are properly set or broken.

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

3b Millstone Unit No. 2 presently has procedures in place to deal with equipment declared to be inoperable. Justification to continue or return to operation will be based upon an evaluation of the valve's effect on the 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 Delta-P [(Seat Area x Seat Coefficient) -Stem Area] + Stuffing Box Load
- Valve Thrust (closed) = K x Delta-P [(Seat Area x Seat Coefficient) + Steam 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 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.

Question 4

Please submit and justify a date for planned completion of action item f of the Bulletin. As indicated by the response of 06-11-86, the specified due date of January 15, 1988 for action item f will not be met.

NNECO Response

NNECO's response to IE Bulletin 85-03, dated June 11, 1986 addressed this question. As outlined in that letter, new testing systems were being introduced at the time of Millstone Unit No. 2's last outage. These testing systems needed to be evaluated to ensure that all aspects of this rather complex issue were being addressed adequately. These systems have been evaluated and the MOVATS system was chosen and was used to assist in our response for Millstone Unit No. 1 and is presently being used at the Haddam Neck Plant.

Action item f cannot be completed until all valves are tested. This will not occur until the completion of the upcoming early 1988 refueling outage which is scheduled to begin around January 1, 1988, and extend into March 1988. Item f can be completed 60 days subsequent to completion of the outage.