NORTHEAST UTILITIES
THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
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October 31, 1989

Docket Nos. 50-245
50-336
50-423
B13366

Re: Rosemount Transmitters

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Gentlemen:

Millstone Nuclear Power Station Units Nos. 1, 2, and 3
Rosemount Transmitters

Northeast Nuclear Energy Company has provided information to the NRC regarding the Rosemount transmitters at our plants. In References (1) thru (5) we furnished updated information on important developments and responded to NRC questions.

As our efforts continue on the Rosemount transmitter issue, we wish to keep the NRC advised of pertinent developments. There are two new items we wish to offer. One is of a historical nature, and the second supports an emerging consensus for an action plan.

The first item involves the Millstone Unit No. 3 reactor coolant system flow trip signal. During the first cycle of operation, we had determined that five of the Reactor Coolant System (RCS) flow transmitters failed at different times, and we reported this under 10CFR21 (Reference (1)). Millstone Unit No. 3 is now in the middle of the third cycle of operation and no further failures have occurred since the first cycle. As part of our continuing assessment of the Rosemount transmitter issue, we recently reviewed the effects of failed transmitters on the reactor protection system reliability for various transients and the effects of failed transmitters on calculated core melt frequency. In order to perform a quantitative evaluation, some assumptions were made. We assumed as a base that the mean time to detect a random transmitter failure (irrespective of the Rosemount issue) is 16 hours. The actual number varies since some failures of plant transmitters may be immediately detectable and others may not be detected until the next test interval, which could be as long as 18 months. For the five Rosemount RCS flow transmitters that failed, we assumed for analysis purposes that they were not detectable for up to 18 months, even though four of them were actually identified through channel checks during the first cycle, were declared inoperable, and the channel was placed in a tripped condition until they were replaced.

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The analysis indicates that for two design transients, namely a Reactor Coolant Pump (RCP) Shaft Break and a Locked Rotor Transient, the RPS unavailability could have been increased from a base of approximately 5×10^{-5} on demand, by a factor of sixty-four, before we were aware of a means to detect failures in the flow transmitters. The reason for this increase is that all three transmitters on each RCS loop are Rosemount transmitters, and there is no diverse trip signal credited in the FSAR for these two transients. However, when this was combined with the frequency of occurrence of all design basis transients, the weighted average increase in RPS unavailability was only twelve percent (12%). Further, since the anticipated transients without scram (ATWS) events contribute roughly eight percent (8%) to the Millstone Unit No. 3 core melt frequency, the failed Rosemount transmitters represented about a one percent (1%) increase (or 6×10^{-7} per year increase) in core melt frequency during the first cycle of operation. We therefore concluded from an overall risk perspective, that the Rosemount transmitter loss of oil problems did not result in unsafe operation of Millstone Unit No. 3. Now that we (1) have a better understanding of the Rosemount transmitter failure cause and symptoms (2) expect to have a substantially smaller failure probability with increased time in service beyond 36 months, and (3) have improved the means for detecting loss of oil conditions for most of the transmitters, there is virtually no increase in RPS unavailability.

The potential applicability of the Rosemount Transmitter concerns to other facilities would be a function of a number of factors. These include:

- o The degree of reliance on Rosemount transmitters, (e.g., a plant with four (4) Rosemount transmitters for pressurizer pressure detection may not have the same design diversity and reliability as a plant with two (2) Rosemount transmitters and two (2) transmitters from another manufacturer).

- o The time in service for the subject transmitters,

- o The scope and frequency of surveillance testing, (e.g., to the best of our knowledge, there is no current means of detecting a loss of oil for pressurizer pressure detectors during power operation).

The second item that we wish to confirm is the desirability of an industry action plan that will result in detection methods and guidelines that may be required on the Rosemount transmitters. This was discussed at length at the conclusion of the NRC/industry meeting (Reference (5)). The BWR Owner's Group Committee on Rosemount Transmitters, and Rosemount, Inc. have also identified this as an important objective. NNECO remains very supportive of the objective of resolving this issue, and we are continuing to share our knowledge and perspectives on the matter.

No reply to this letter is requested, and we remain available to respond to any questions you may have.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
M. L. Boyle, NRC Project Manager, Millstone Unit No. 1
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

References

(1) E. J. Mroczka (NU) letter to W. T. Russell (NRC), Report of Substantial Safety Hazard, B12863, March 25, 1988.

(2) E. J. Mroczka (NU) letter to NRC, Rosemount Transmitters, B13178, April 13, 1989.

(3) NRC Meeting on Rosemount transmitters, NU Presentation, Rockville, Maryland, April 13, 1989.

(4) E. J. Mroczka (NU) letter to NRC, Response to Inspection 50-423/89-04, A08132, August 1, 1989.

(5) NRC Meeting on Rosemount transmitters, Rockville, Maryland, August 23, 1989.