

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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July 30, 1993

Docket No. 50-245
B14556

Re: Regulatory Guide 1.97

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 1
Regulatory Guide 1.97
BWR Neutron Flux Monitoring (TAC No. M51106)

In a letter dated April 1, 1993,⁽¹⁾ the Staff forwarded a copy of a safety evaluation for Boiling Water Reactor (BWR) Owners' Group Report NEDO-31558, "Position on NRC Regulatory Guide 1.97, Revision 3, Requirements for Post-Accident Neutron Monitoring System." NEDO-31558 proposed alternate criteria for neutron monitoring system (NMS) instrumentation in lieu of the Category 1 criteria stated in Regulatory Guide (RG) 1.97.

In the letter, the Staff requested that Northeast Nuclear Energy Company (NNECO) review the Millstone Unit No. 1 NMS instrumentation against the criteria of NEDO-31558 to determine whether the alternate criteria are met, and document to the NRC the results of our review. Furthermore, a statement of the results of the plant-specific evaluation of NMS power supplies was specifically requested.

Although Northeast Utilities was an initial sponsoring utility of the BWR Owners' Group RG 1.97/NMS Committee, we were not a participant in the ultimate development of the topical report. This circumstance was discussed with the Staff at the time of our verbal 60-day notification of the actions we planned to take on this issue. Our review and response schedule was identified as being dependent on our ability to acquire the right to utilize the NEDO-31558 report. Since that time, NNECO has procured the rights to this report, and this letter provides our formal response to the Staff's request for additional information based on that document.

(1) J. W. Andersen letter to J. F. Opeka, "Regulatory Guide 1.97 - Boiling Water Reactor Neutron Flux Monitoring (TAC M51106)," dated April 1, 1993.

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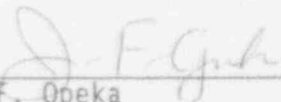
Millstone Unit No. 1 lists the NMS as variable B-1 in the matrix of RG 1.97 variables. NNECO has completed the review of NEDO-31558 and has determined that with one exception Millstone Unit No. 1 NMS instrumentation meets the proposed alternate criteria. For this exception, Human Factors, NNECO has committed to changes such that the NMS installation would meet the alternate criteria.

Several of the functional design criteria identified in Section 5.0 of NEDO-31558 require plant-specific evaluations to determine applicability. The summary results of these evaluations, including the requested evaluation of power supplies, are presented in Attachment 1 to this letter. Also included in this summary is the statement of the commitment required to achieve full conformance with the NEDO-31558 criteria.

We trust that this information is acceptable to the Staff. Please contact us if you have any questions.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



J. F. Opeka
Executive Vice President

cc: T. T. Martin, Region I Administrator
J. W. Andersen, NRC Acting Project Manager, Millstone Unit No. 1
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2,
and 3

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Attachment 1

Millstone Nuclear Power Station, Unit No. 1

Regulatory Guide 1.97
BWR Neutron Flux Monitoring (TAC No. M51106)

July 1993

Millstone Nuclear Power Station, Unit No. 1
Regulatory Guide 1.97
BWR Neutron Flux Monitoring (TAC No. M51106)

Summary of Plant-Specific Functional Design Criteria

Reference: BWR Owners' Group Report NEDO-31558, "Position on NRC Regulatory Guide 1.97, Revision 3, Requirements for Post-Accident Neutron Monitoring System."

Note: Numbers in parenthesis refer to applicable NEDO-31558 section.

Accuracy (5.2.2)

Instrument accuracy for the Neutron Monitoring System (NMS) is better than $\pm 2\%$ of rated power. During plant operation, the Average Power Range Monitor (APRM) output is continuously monitored by the plant computer and compared to thermal power to assure this accuracy. The APRMs are normally maintained within $\pm 1\%$ of the calculated core thermal power.

Equipment Qualification (5.2.4)

The environmental conditions anticipated for postulated Millstone Unit No. 1 Anticipated Transient Without Scram (ATWS) events are bounded by the system design specifications. The research summarized by the NEDO report determined that ATWS events imposed the most limiting requirements on the neutron flux monitoring equipment. The neutron flux monitoring equipment is not subject to any adverse environmental conditions due to ATWS events. This is primarily because all safety relief valves at Millstone Unit No. 1 are piped into the suppression pool.

Function Time (5.2.5)

The function time required for postulated ATWS events is less than the NMS equipment design specifications. Since there is no adverse ATWS environment which affects the NMS at Millstone Unit No. 1, the equipment will remain operable for its normal lifetime, which is much longer than the design survival time for abnormal environments as outlined in the NEDO report. Therefore, there is no limitation on function time. The function time is far in excess of the one-hour time requirement in the NEDO report.

Power Sources (5.2.8)

Power distribution for the NMS high voltage power supplies, electronics, and display indicators is provided by redundant 120-volt AC Reactor Protection System (RPS) buses "A" and "B" which are uninterruptible to the extent that they are not subject to load shed events. The six APRM channels are evenly

divided between these two buses. The recorders, however, are powered from a common 120-volt Vital AC source. Although this Class 1E power source is uninterruptible and highly reliable, the recording function could be lost due to a passive single failure of a switchboard. However, since display indication is fully redundant per the Redundancy and Separation criteria (Section 5.2.7), NNECO does not consider the recording function to be essential in meeting the functional criteria for the NMS.

Quality Assurance (5.2.10)

The NMS monitoring equipment is maintained as QA Category 1 and, as such, exceeds the guidance issued in Generic Letter 85-06, "Quality Assurance Guidance for ATWS Equipment that is not Safety Related."

Equipment Identification (5.2.12)

The NMS indicators and recorders are not presently identified on the control panels as post accident monitoring instrumentation per RG 1.97 recommendations. These indicators and recorders are, however, clearly marked for their purpose. Any labelling modifications necessary to be consistent with the Millstone Unit No. 1 control room design review (CRDR) will be implemented per the Human Factors criterion (Section 5.2.15).

Service, Test and Calibration (5.2.14)

The appropriate service, test and calibration requirements for the NMS are established in Instrument and Controls Procedures in the IC/SP 401 thru IC/SP 404 series.

Human Factors (5.2.15)

The NMS indication has not been upgraded to the practices established by the Millstone Unit No. 1 CRDR. This upgrading has been committed to in Phase II and Phase III of the CRDR project (Integrated Safety Assessment Program Topic 1.07). The NMS enhancements are currently scheduled to be implemented during the Cycle 14 and Cycle 15 refuel outages.