January 17, 1991

Docket No. 50-423

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Mr. Edward J. Mroczka
Senior Vice President
Nuclear Engineering and Operations
Connecticut Yankee Atomic Power Company
Northeast Nuclear Energy Company
P.O. Box 270
Hartford, Connecticut 06141-0270

Dear Mr. Mroczka:

SUBJECT: MILLSTONE UNIT 3 - REQUEST FOR ADDITIONAL INFORMATION REGARDING INDIVIDUAL PLANT EXAMINATION (TAC NO. 74434)

By letter dated August 31, 1990, you submitted the Millstone Unit 3 "Individual Plant Examination for Severe Accident Vulnerabilities - Summary Report Submittal," NUSCO-171. The IPE Summary Report was provided in response to Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)" dated November 23, 1988. In the process of reviewing your August 31, 1990 submittal, we have found it necessary to request the additional information contained in the enclosure. Within 90 days following receipt of this letter, please provide your response to the enclosed questions.

The requirements of this letter affect fewer than 10 respondents and therefore, are not subject to Office of Management and Budget review under P.L. 96-511.

Sincerely,

/S/

David H. Jaffe, Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

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NAME	:SNorris	:DJaffe:cn	:JStolz	:	:
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PDR ADOCK 05000423
P PDR

cc:

Gerald Garfield, Esquire
Day, Berry and Howard
Counselors at Law
City Place
Hartford, Connecticut 06103-3499

W. D. Romberg, Vice President
Nuclear Operations
Northeast Utilities Service Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Kevin McCarthy, Director
Radiation Control Unit
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06106

Bradford S. Chase, Under Secretary
Energy Division
Office of Policy and Management
80 Washington Street
Hartford, Connecticut 06106

S. E. Scace, Nuclear Station Director
Millstone Nuclear Power Station
Northeast Nuclear Energy Company
Post Office Box 128
Waterford, Connecticut 06385

C. H. Clement, Nuclear Unit Director
Millstone Unit No. 3
Northeast Nuclear Energy Company
Post Office Box 128
Waterford, Connecticut 06385

Ms. Jane Spector
Federal Energy Regulatory Commission
825 N. Capitol Street, N.E.
Room 8608C
Washington, D.C. 20426

Burlington Electric Department
c/o Robert E. Fletcher, Esq.
271 South Union Street
Burlington, Vermont 05402

R. M. Kacich, Manager
Generation Facilities Licensing
Northeast Utilities Service Company
Post Office Box 270
Hartford, Connecticut 06141-0270

D. O. Nordquist
Director of Quality Services
Northeast Utilities Service Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Regional Administrator
Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

First Selectmen
Town of Waterford
Hall of Records
200 Boston Post Road
Waterford, Connecticut 06385

W. J. Raymond, Resident Inspector
Millstone Nuclear Power Station
c/o U. S. Nuclear Regulatory Commission
Post Office Box 811
Niantic, Connecticut 06357

M. R. Scully, Executive Director
Connecticut Municipal Electric
Energy Cooperative
30 Stott Avenue
Norwich, Connecticut 06360

Mr. Alan Menard, Manager
Technical Services
Massachusetts Municipal Wholesale
Electric Company
Post Office Box 426
Ludlow, Massachusetts 01056

ENCLOSURE

(1) Concisely discuss the criteria used by Northeast Utilities to define a vulnerability. Identify any potential vulnerabilities, fundamental causes, and modifications that stemmed from application of the criteria. Specifically highlight any potential vulnerabilities associated with the decay heat removal.

Provide a listing of any modifications derived from the PSS/IPE process to identify any potential vulnerabilities excluding those modifications listed in Table 6-2 of the Millstone 3 IPE submittal.

(2) Discuss any plant-specific initiators identified and found to be important as part of the PSS/IPE process.

(3) Provide a listing of all the fault trees developed for the Millstone 3 PSS/IPE.

Identify the bases (best-estimate analyses or FSAR analyses) of the success criteria given in Table B.1 of the Millstone 3 IPE submittal.

(4) Identify the data sources for the following: ECCS and RHR pumps, loss of feedwater and loss of offsite power initiating events, diesel generators, auxiliary feedwater pumps, batteries, electrical buses and breakers.

(5) Have you documented the major assumptions in the Millstone 3 PSS/IPE in any one location?

Provide a copy of the latest version of the "Key Assumptions Document", and provide a concise discussion of how preventive and mitigative actions for severe accident scenarios are incorporated in the document, and how the document is being used for upgrading training and procedures.

(6) HVAC does not appear on the systems dependency matrix. Discuss the loss of HVAC and its potential contribution to the likelihood of core damage, and how it was treated in the IPE process.

The IPE submittal states that in response to the Station Blackout Rule, room cooling reliability has been improved. Discuss these improvements and their impact on plant risk.

(7) In NUREG-1152 it is stated that: "the staff judged the flood analysis to be incomplete and the results of the analysis to be speculative." Provide a concise discussion of the scope of the flooding analysis, including any additional efforts not previously recognized, and discuss how the flood analysis meets the IPE objectives stated in Generic Letter 88-20.

Identify (or provide reference) on equipment that fails due to flooding of specific fire areas.

Discuss how the IPE analysis treated overfilling of water tanks, hose ruptures, pipe ruptures, and pump seal leakage.

Discuss any recovery actions in your flooding analysis or provide reference.

(8) The IPE submittal stated that complete loss of service water was ruled out based on low frequency, but would be included in a future update of the model. Discuss how the PSS methodology was used to identify vulnerabilities in the service water system, including potential causes of common cause failures, and any assumptions that would justify the low value of the initiator frequency. If a PRA update on service water is forthcoming, when is this to be expected?

(9) In NUREG-1152 it is stated that: "the analysis in the PSS of reactor coolant pump (RCP) seal failure due to loss of cooling (analyzed for station blackout) is in error." Discuss the source and significance of this error, the contribution of pump seal LOCA to core damage, and any previously unrecognized modifications or efforts that Northeast Utilities has taken to reduce the risk stemming from this contributor.

(10) NUREG-1152 states that the NRC staff review "identified a significant omission in the PSS related to the dependence on the vital DC system by the vital AC system, the main electrical system, and the emergency generator load sequencer, which was not included on the corresponding fault trees." Provide a concise discussion of the potential impact of loss of DC on plant safety, and any plant features or modifications that have been implemented that might reduce the significance of loss of DC events.

(11) Provide the reduction in core damage frequency (delta CDF) for the following features:

- feed and bleed
- recovery of the Power Conversion System (PCS) to remove decay heat

(12) NUREG-1552 stated that: "Northeast Utilities' submittal of its draft Technical Specifications embraces the 3-month test interval. If such a frequency change is incorporated in the final Millstone 3 Technical Specifications, it could result in a three-fold increase in mean component failure probabilities for failures that are time dependent. This would affect estimated unavailabilities for systems such as high pressure safety injection and containment recirculation." If these Technical Specification changes were incorporated, provide a discussion of the quantitative impact on plant risk.

(13) Provide a concise discussion of the measures to be taken (procedure, training, hardware) to prevent and/or mitigate containment bypass events (V sequences).

Is the loop isolation valve arrangement different for Millstone 3 than for Surry? If "full credit" were to be given for it, what is the basis for the credit for these valves in a V-sequence? How is credit currently assigned for these valves?

(14) Describe the manner in which high temperature induced steam generator tube rupture events have been or would be included in the Millstone 3 PSS. In which plant damage class has it or would it be placed? What assurance do you have that it would not add significantly to the source term release from containment?

(15) Identify and discuss any equipment whose operability is desired during exposure to harsh environmental conditions associated with severe accidents. Include any exposed systems required for accident mitigation, and any instrumentation required for maintaining plant status.

Discuss the assessment of the penetration elastomer seal materials and their response to prolonged high temperature.

(16) According to Generic Letter No. 88-20, Supplement No. 3, subatmospheric containments may develop detonable mixtures of hydrogen on a global basis. Provide a concise discussion of the assumptions, plant-specific analyses and findings related to assessing the likelihood of a local and global hydrogen detonation.

Discuss your evaluation of containment and potential equipment vulnerabilities to localized hydrogen combustion, and any associated improvements (including accident management procedures) as appropriate.

What assurance does Millstone 3 have that stratification of hydrogen will not occur and produce damaging local detonations?

(17) Provide a concise discussion of the risk impact due to a change in the containment isolation probability as a result of the proposed increase of the containment pressures to 14 psia at full power.

Document and discuss the conditional probability that the containment is not isolated prior to a severe accident.

(18) Provide a concise discussion of how phenomenological uncertainties were considered in the IPE. It is recognized that the treatment of uncertainties may be either quantitative or qualitative. In either case, discuss the consideration of these uncertainties in any decision making activities related to IPE.

(19) Provide a concise discussion of the technical bases for determining the applicability of the insights from the NUREG-1150 Analysis for Surry to Millstone 3, taking into consideration that there are differences in plant-specific features and there is a proposed increase of the containment pressure for Millstone 3.

(20) Discuss any source term reduction taken for core debris coolability. Include both in-vessel and ex-vessel phenomena.

(21) Discuss the Millstone 3 staff's efforts to evaluate the plant for its response to a direct containment heating (DCH) event. Discuss any plant unique features

which would heighten or lessen its impact in comparison to Surry?

How would the heightened probability of direct impingement of high pressure melt on the containment wall in DCH events be included in comparison to Surry, i.e., what assurance do you have that it would not significantly increase the containment failure likelihood?

(22) Provide a list (or reference) of human recovery actions that were integrated into the PSS/IPE.

Identify those sequences that, but for low human error rates in recovery actions, would have been above the screening criteria in NUREG-1335.

(23) The Millstone 3 PSS was completed while the plant was under construction. Therefore, a full human reliability analysis based on the performance shaping factors (crew, procedures, training, etc.) of the operating plant was impossible. Given that situation, for its human reliability analysis, Northeast Utilities used information from three other nuclear power plants that it had operating at that time, and used other "conservative" assumptions (PSS, p. 2-D-1).

Provide justification as to why a complete plant-specific human reliability analysis on Millstone 3 in its current operating state had not been performed, in order to demonstrate that the current operating state does not contain a vulnerability.

(24) What steps has Northeast Utilities taken to provide assurance that its human reliability analysis is current and complete?

Specifically, what steps has Northeast Utility taken to provide assurance that its analysis of performance shaping factors (e.g., training, procedures, experience levels, shift scheduling, delegation of responsibilities) is current and complete?

(25) In quantifying human error rates, the Millstone 3 PSS used a review draft of NUREG/CR-2815, National Reliability Evaluation Program Procedures Guide, which was issued in June 1982 (PSS, p. 2-D-1). This report was issued in final form in 1984, and revised in 1985. Provide justification for using an IPE human reliability analysis that is based on a review draft, now that the final documents have been issued.

(26) In the gathering of plant-specific data on human reliability, and in the conduct of the Millstone 3 PSS as a "living" PRA, Northeast Utilities personnel have identified and carried out projects to reduce the probability of human error. What assurance can Northeast Utilities provide that the projects that have been identified and carried out cover all important potential human error vulnerabilities? For example, were the sequences in the PSS systematically evaluated in order to identify human error improvement projects?

(27) In order to satisfy the requirements of Supplement 1 of NUREG-0737, Northeast Utilities performed task analyses for Millstone 3. Discuss how the results of these task analyses were used in human reliability analysis of the IPE submittal.