January 11, 1995

Mr. Robert E. Busch
President - Energy Resources Group
Northeast Utilities Service Company
c/o Mr. Richard M. Kacich
P.O. Box 128
Waterford, CT 06385

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION CONCERNING THE REQUESTS FOR ALLOWED OUTAGE TIME EXTENSIONS FOR EMERGENCY DIESEL GENERATOR SYSTEMS, THE SAFETY INJECTION TANKS AND THE LOW PRESSURE SAFETY INJECTION SYSTEM AND THE COMBUSTION ENGINEERING OWNERS GROUP (CEOG) JOINT APPLICATION REPORTS RELATING TO THESE REQUESTS (TAC NOS. M93353, M93362 AND M94029)

Dear Mr. Busch:

The NRC staff has reviewed your requests of August 23 and November 3, 1995, for amendments and the CEOG joint application reports that would provide extension of the allowed outage time (AOT) for the Emergency Diesel Generators (EDG), the Safety Injection Tanks (SIT) and the Low Pressure Safety Injection (LPSI) System and has identified several areas where additional information is needed.

Enclosed is a request for additional information. Please provide your response within 45 days from the receipt of this request. This requirement affects nine or fewer respondents, and therefore, is not subject to the Office of Management and Budget review under P.L. 96-511.

Sincerely,

Original signed by:

Guy S. Vissing, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-336
Enclosure: Request for Additional Information
cc w/encl: see next page

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Northeast Utilities Service Company
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 11, 1995

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Northeast Utilities Service Company
c/o Mr. Richard M. Kacich
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Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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REQUEST FOR ADDITIONAL INFORMATION
CONCERNING
REQUEST FOR ALLOWED OUTAGE TIME (AOT) EXTENSIONS
FOR
THE EMERGENCY DIESEL GENERATORS (EDG), THE SAFETY INJECTION TANKS (SIT)
AND THE LOW PRESSURE SAFETY INJECTION SYSTEM (LPSI)
MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2
DOCKET NO. 50-336

Questions Applying to All Three Joint Application Reports

1. We are assuming that the Probabilistic Risk Assessment (PRA) used in the Millstone 2 "at power" analysis is the Individual Plant Examination (IPE) PRA submitted by Northeast Nuclear Energy Company to the NRC in December 1993, with clarification provided to the NRC by the Northeast Nuclear Energy Company on September 20, 1995 (Responses to the NRC request for additional information). Is this assumption correct?

2. The extended AOTs will be used, at least for Low Pressure Safety Injection (LPSI) trains and Emergency Diesel Generators (EDGs), to conduct on-line preventive maintenance (PM). Please indicate whether or not the system trains are presently being taken out simultaneously with other safety system equipment for "on-line" PM purposes.

3. What is the projected average corrective maintenance (CM) and PM downtime for the equipment for which extended AOTs are being requested?

4. The NRC staff has developed a "three-tiered" approach for reviewing risk-informed improvements to the Technical Specifications (TSs). Tier 1 involves setting an upper limit on AOTs based on Δ Core Damage Frequency (CDF) and containment performance. Tier 2 involves pre-determined restrictions on high-risk configurations by limiting simultaneous equipment outages. Tier 3 involves performance of a real-time assessment of the overall impact on the safety of proposed configurations prior to performing maintenance activities which will remove equipment from service. Please provide information on how you would address Tiers 2 and 3 for the proposed AOT extensions.

5. Are the compensatory measures presented for the AOT extensions currently followed, or would they be implemented when the AOT extensions are granted?

6. If the CDF is calculated with respect to a component that is not in the cut set list due to applying cut-off probabilities to cut sets, the application states that the eliminated cut sets containing the component are retrieved and CDF is calculated. How is the analyst assured that all cut sets containing the component of interest are retrieved? Please explain the process used in this case.

7. Please provide the truncation cutoff used to quantify the CDFs presented. Particularly indicate what efforts were made to avoid underestimation when the impact calculated was negligible or non-existent. For example, the impact of one Safety Injection Tank (SIT) unavailable was calculated to be zero or negligible for Millstone 2.

8. You are comparing delta's in risk from "at power," transition, and shutdown to make your case that the net effect of the AOT extensions reduces risk. What assurance do you have that each element of the comparison is equally a "best-estimate" or equally conservative? Subtracting a best-estimate delta from a conservative delta could result in values for net effect that are only artifacts of the process and not real. For example, for the LPSI System AOT analysis, the shutdown portion appears to be conservative while the "at power" analysis appears to be best-estimate. Please discuss how you ensure that the elements are all based on the same assumptions.

9. Explain how you addressed uncertainties in your calculations of "at power," transition, and shutdown risk.

10. What review of the PRA was made to ensure that the PRA represents the as-built, as-operated plant, and contains the fine structure (resolution) necessary to evaluate the proposed TS requirements? Were any changes made to the PRA due to such reviews? If yes, please provide a list of these changes.

11. An increased AOT is expected to reduce the number of entries into Limited Condition of Operation (LCO) action statements by allowing a more complete maintenance program during a single AOT. Please provide a detailed example to show the rearrangement of maintenance activities for your plant with the increased AOTs. (Also see related Question 22 on EDGs.)

12. Please explain how an extension of the AOT reduces the need for simultaneous common system PM operations (e.g., page 6 of LPSI System Report)?

13. Is repair time data available for the events described in Table 5.2-1 of the SIT Report?

14. Given the use of the current PRA estimate to justify the requested extended AOTs, will you periodically reexamine your "living PRA" to ensure that an increase in "at power" CDF due to the extended AOT is not significantly different than you estimated during future plant operation?

Questions Applying to the EDG Report

15. In your submittal of August 23, 1995, you proposed to extend the AOT from 3 days to 7 days and once-per-fuel-cycle allowance for an AOT of 10 days for each EDG to perform PM or CM. It is not clear why a 7-day AOT time is needed for every EDG AOT. The NRC staff has been considering the extensions of EDG AOTs on a plant-specific basis if the primary intent of extending the EDG AOT is to perform the 18-month manufacturer-recommended maintenance such as teardowns or preplanned PM or modifications that would otherwise extend beyond the original AOT. Please state your reason for extending your current EDG AOT. Your response should also include instances where your current AOT was insufficient to perform PM or CM.

16. The staff is presently concerned that the extensions of EDG AOTs may increase the mean CDF for the station blackout (SBO) events, and impact resolution of the SBO issue. Provide the calculated CDF for SBO sequences without the proposed AOT extension and the CDF for SBO sequences with the proposed AOT extension. Also provide the overall unavailability of the EDGs used in the PRA to calculate the CDFs for the SBO sequences requested.

17. Provide a discussion of the loss of offsite power events at your facility and include a quantitative discussion on how industry data on offsite power losses compares with your facility.

18. The staff has recently granted an extension of an EDG AOT to a plant that has installed a weather-protected tie-line from a hydro station used as an Alternate AC (AAC) source which will be substituted for the inoperable EDG during the extension. The extension was granted based on the licensee's commitment to meet the following conditions. Provide a discussion of how you would address each condition listed below.

    a. The TS should include verification that the required systems, subsystems, trains, components, and devices that depend on the remaining EDGs as a source of emergency power are operable before removing an EDG for PM. In addition, positive measures should be provided to preclude subsequent testing or maintenance activities on these systems, subsystems, trains, components, and devices while the EDG is inoperable.

    b. The overall unavailability of the EDG should not exceed the value that was used in the PRA supporting the proposed AOT. Also, the EDG unavailability should be monitored and controlled in accordance with the maintenance rule performance criteria.

    c. For those plants that have an AAC source, it may be appropriate to demonstrate, before taking an EDG out for an extended period, that the AAC source is functional by verifying that the power source is

capable of being connected to the safety bus associated with the inoperable EDG, and verifying this capability of being connected to the safety bus periodically thereafter.

d. Voluntary entry into an LCO action statement to perform PM should be contingent upon a determination that the decrease in plant safety is small enough and the level of risk the plant will be at is acceptable for the period and is warranted by operational necessity, not by convenience.

e. Voluntary entry into an LCO action statement should not be abused by repeated entry into and exit from the LCO.

f. Removal from service of safety systems and important non-safety equipment, including offsite power sources, should be minimized during the outage of the EDG for PM.

g. Voluntary entry into an LCO action statement should not be scheduled when adverse weather is expected.

19. Indicate if your plant has any excess capacity in the onsite power system.

20. Provide a list of typical PM or CM that can take over 72 hours to complete and explain how this task is accomplished within the current LCO. Include in your response the type of PM (which is required for your EDGs) that you intend to do during power operation and specify the time it takes to accomplish it.

21. In the PRA, when an EDG is taken out of service, did you assume the whole Engineering Safety Feature (ESF) electrical power division to be inoperable for the purpose of calculating the increase in CDF? If not, why not?

22. Provide the major electrical component failure rates used in your PRA.

Questions Applying to the SIT and LPSI Reports

23. How do you define core damage in your PRA?

24. Table 6.3.2-1 of the SIT Report indicates a success criteria. Is this the success criteria that the plant was licensed to or is this a different criteria that was developed for the PRA? If it is not the criteria the plant was licensed to, what is the basis for its use in the PRA?

25. Does the PRA take credit for any analyses that have not been approved by the NRC staff?

Generic Questions for the CEOG as a Whole

26. Does the statement on page 28 of the LPSI System Report, "Given the fact that the frequency of requiring LPSI at power is on the order of 1 x 10^{-4} per year (the frequency of a Large LOCA [Loss of Coolant Accident] event) . . ." include consideration of the mitigation of non-large LOCAs? If so, describe these initiators and their contribution to the 1 x 10^{-4} per year total.

27. On page 11 of the EDG Report it is stated that plants with 3-day AOTs have a mean yearly scheduled maintenance unavailability of about 77 hours per EDG per year compared to 132 hours per EDG for plants with a 7-day EDG AOT. Both groups show similar yearly repair time outages for unscheduled maintenance (46 versus 51 hours). The above suggests that the longer the EDG AOT, the longer it takes to perform CM or PM. The above numbers also suggest that the plants with 72-hour AOTs manage their time better and have less total unavailability than the plants who have 7-day AOTs. Based on the above, explain why the difference in mean yearly scheduled maintenance unavailability exists.

28. On page 11 of the EDG Report it is stated that CM is performed on an EDG at a mean frequency of 3.3 times per year with a mean duration of 23.3 hours and a standard deviation of 46.7 hours. A mean duration of 23.3 hours with a standard deviation of 46.7 hours amounts to 70 hours which suggests that 84% of the plants are able to finish EDG repair in 70 hours, and therefore a 72-hour AOT appears to be adequate for the majority of the plants. Based on the above, why should the 7-day AOT be allowed on a generic basis?

29. On page 9 of the CEOG report it is stated that the industry mean PM on an EDG was 24.6 hours with a standard deviation of 37.6 hours. This suggests that maintenance done at power frequently exceeds one-half of the AOT and in about one-quarter of the occurrences exceeds the typical 72-hour AOT. How many Combustion Engineering plants have exceeded the typical 72-hour AOT and how many plants required discretionary enforcement for such situations to continue plant operation in the past 5 years?