UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DEC 15 1980

Docket No. 50-245
LS05-80-12-037

Mr. W. G. Counsil, Vice President
Nuclear Engineering and Operations
Northeast Nuclear Energy Company
P. O. Box 270
Hartford, Connecticut 06101

Dear Mr. Counsil:

SUBJECT: MILLSTONE 1 - SEP TOPIC II-2.A

The SEP review of Topic II-2.A, "Severe weather Phenomena" has been completed. Enclosure 1 is the staff's safety evaluation (SE) for the Millstone 1 site. The review was done in conformance with Standard Review Plan 2.3.1 and covers extreme temperatures, lightning strikes, snow and ice loads and wind and tornado loadings. The wind and tornado loadings analysis was performed by the Texas Tech. University, Institute for Disaster Research. Enclosure 2 is the Texas Tech. report. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment within 30 days of receipt of this letter.

You will note that the SE identifies a design basis tornado with a probability of 10^{-7} per year and is consistent with a Regulatory Guide 1.76 design basis tornado. The staff intends to evaluate the structural characteristics of specific structures, systems and components important to safety to determine their ability to withstand the severe weather loadings. The plant design parameters will then be compared to the probability of occurrence of the wind as a part of our structural evaluation. This comparison will be used to evaluate the necessity of design changes.

Sincerely,

Dennis M. Crutchfield

Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

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Mr. W. G. Counsil

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DOCKET NO. 50-245

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Systematic Evaluation Program

Meteorology

Millstone Nuclear Station Unit 1

Topic II-2.A—Severe Weather Phenomena

Extreme meteorological conditions and severe weather phenomena in the Millstone site region were examined to determine if safety-related structures, systems, and components are designed to function under all severe weather conditions. Discussed below are the severe weather phenomena which could adversely affect the Millstone site and which should be examined relative to the current design.

Normal daily temperatures range from a minimum of 20 degrees Fahrenheit in January to a maximum of 80 degrees Fahrenheit in July. Measured extreme temperatures for the site region are 100 degrees Fahrenheit which occurred in July 1966 and -3 degrees Fahrenheit which occurred in January 1968. The extreme maximum and minimum temperatures appropriate at the Millstone site for general plant design (i.e., HVAC systems) are 89 degrees Fahrenheit (equalled or exceeded 1% of the time) and zero degrees Fahrenheit (equalled or exceeded 99% of the time).

Thunderstorms occur an average of 26 days per year in the site region. Based on the annual number of thunderstorm days, the calculated annual flash density of ground lightning strikes is three flashes per square

kilometer. A structure with the approximate dimensions of the Millstone Unit 1 reactor building can be expected to be subjected, on the average, to one strike every nine years.

The design wind speed (defined as the "fastest-mile" wind speed at a height of 30 feet above ground level with a return period of 100 years) acceptable for the site region is 95 miles per hour. On the average, hail storms occur about one day annually, and freezing rain occurs approximately four days per year. The maximum radial thickness of ice expected in the site region is about 0.75 inch.

Mean annual snowfall in the site region is approximately 30 inches with a normal winter precipitation snow load on a flat surface of about 35 pounds per square foot. The maximum monthly snowfall occurred in February 1934 and totaled 47 inches. The maximum snowfall from a single storm totaled 17.7 inches. The maximum measured snow depth on the ground for the site region is 17.7 inches. Based on the 100-year recurrence accumulated ground snowpack and probable maximum winter precipitation for the site region, the extreme winter precipitation snow load on a flat surface is about 115 pounds per square foot.

Tornadoes have been reported 90 times during the period 1950-1977 within an approximate 60-mile radius from the Millstone site, excluding the water area over the Atlantic Ocean. On the average, three tornadoes can be expected to occur in the vicinity of the Millstone site every year.

The tornado wind analysis done especially for the Millstone site and described in the October 17, 1979 memo (Hulman to Crutchfield) determined the 10^{-7} probability tornado to have a windspeed of 290 miles per hour at the upper 95 percent confidence interval. This value would appear to be appropriate for the design basis tornado that might occur in the Millstone area, although the site is situated in the Regulatory Guide 1.76 Region I having a design windspeed of 360 miles per hour. The analysis of this tornado windspeed was based upon observations of tornadoes within the land portion of the 3x3 degree area encompassing the site.

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H. C. S. Thom, "New Distributions of Extreme Winds in the United States," Journal of the Structural Division, ASCE, Vol. 94, No. ST7, July 1968.

"American National Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures," ANSI, A58.1-1972.

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Memo from Harold R. Denton (Assistant Director for Site Safety, Division of Technical Review, NRR) to R. R. Maccary (Assistant Director for

Engineering, Division of Technical Review, NRR) dated March 24, 1975, Subject: Site Analysis Branch Position - Winter Precipitation Loads.

Memo from Jerry Harbour (Chief, Site Safety Research Branch, Division of Reactor Safety Research, RES) to L. G. Hulman (Chief, Hydrology-Meteorology Branch, Division of Site Safety and Environmental Analysis, NRR) dated August 14, 1978, Subject: Tornado Frequency Data for SEP Review.

Regulatory Guide 1.76, "Design Basis Tornado for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, D.C.

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