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

June 27, 1980

Docket No. 50-245

Mr. W. G. Counsil
Nuclear Engineering & Operations
Connecticut Yankee Atomic Power Co.
P.O. Box 270
Hartford, Connecticut 06101

Dear Mr. Counsil:

We are continuing our review of the adequacy of station electric distribution system voltages for Millstone Unit No. 1 and have found that additional information described in the enclosure to this letter is needed. We request your response within 45 days of your receipt of this letter.

Sincerely,

Dennis M. Crutchfield

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

Enclosure:
Request for Additional
Information

cc w/enclosure:
See page 2

cc w/enclosure:
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REQUEST FOR ADDITIONAL INFORMATION
MILLSTONE #1
ADEQUACY OF STATION ELECTRIC DISTRIBUTION SYSTEM VOLTAGES

Ref. 1: NRC letter (W. Gammill) to all Power Reactor Licensees, dated August 8, 1979

Ref. 2: Attachment 2 of Northeast Utilities letter (W. G. Counsil) to NRC (D. L. Ziemann), dated November 15, 1979

1. Guidelines 1 and 7 (Ref. 1) require that a separate analysis be performed for all available connections to the offsite network and that the analysis be adequately documented for each condition analyzed. Ref. 2 does not fully meet these requirements. To confirm the acceptibility of the voltage conditions on the station electric distribution system, submit adequate voltage analysis documentation for those cases and conditions analyzed in Ref. 2 and additional documentation specifically:

   a. Requirements of Guidelines 6 and 11 as well as 5 and 13 (Ref. 1) must be included in each separate case analyzed. These guidelines refer to the use of minimum and maximum expected grid voltages, maximum loads assumed for each analyzed case, and a list of assumptions for each analyzed case.

   b. Supply the calculated voltages for all low-voltage AC (less than 480 volts) Class 1E buses (include all available sources) for each case analyzed. Do these buses supply and instruments or control circuits as required by GDC 13? If so, is all equipment capable of sustaining the analyzed voltages without blowing fuses, overheating, and without affecting the equipment's ability to perform the required function?

c. Per Guidelines 3 and 9 (Ref. 1), compare the effect of starting and running the largest non-Class 1E load on all Class 1E buses and loads with the required voltage range for normal operation of all Class 1E equipment (starters, contactors, motors, etc.) for each available connection of offsite sources. This comparison should occur after the Class 1E buses are fully loaded.

d. Ref. 2, Page 3, Item a identifies that a source connection to the Class 1E buses exists by backfeeding from the 345 KV switchyard through the main transformer and transformer NSST-1. A complete analysis is required for this source connection.

e. Ref. 2, Page 2, Paragraph 2 identifies the alternate offsite supply as SDT-1 which is fed from a 23 KV feeder from Flanders 11 Y substation. An analysis is required for this available source connection or identify limiting conditions of operation. What is the normally expected voltage range of this 23 KV feeder?

f. From the sketches of the auxiliary buses submitted in Ref. 2 (Millstone #1 and Millstone #2), it appears there are two possible source connections to the Class 1E buses from transformers RSST-2 and NSST-2 (Millstone #2) via the link from transformer RSST-1. An analysis is required for these source connections unless interlocks prevent the connection or limiting conditions of operations are identified.

2. Ref. 2, Pages 3 and 4 identifies four separate conditions when the +10% overvoltage capability of the motors on the 480-volt buses is exceeded. Installation of overvoltage monitors is planned to initiate operator

corrective action. Credit will be given for this corrective action only if the overvoltage monitors and alarms are Class 1E, and in the interim period of correction the overvoltage condition does not shorten equipment life or affect the Class 1E equipment's ability to perform the required function. Provide documentation which demonstrates the equipment can meet these overvoltage conditions.

3. Ref. 2, Page 5, Paragraph 1 states that the setpoint of the second level of undervoltage protection will be reset to the new value of 336 KV (switchyard voltage). The design of the second-level of undervoltage protection must meet the requirements of IEEE 297-1971. Provide the undervoltage and time setpoints in terms of Class 1E nominal bus voltage and compare these setpoints as required in Guidelines 10 and 12 (Ref. 1).

4. Ref. 2, Page 5, Paragraph 2 refers to the addition of a second second-level of undervoltage protection when the transformer RSST-1 is carrying Millstone #2 shutdown loads and Millstone #1 Normal and LOCA loads. The design of the second-level of undervoltage (NRC Staff Position 1, June 2, 1977 letter) is to protect all Class 1E equipment from grid voltage degradation under <u>all</u> modes of operation. Explain in detail why this second second-level protection scheme is necessary.

5. Submit a voltage analysis which meets Guideline 2 (Ref. 1), that is Unit #1 is experiencing an accident or anticipated transient with the simultaneous shutdown of Unit #2 for all available source conditions.