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December 20, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Piping Seismic Analysis Changes

Dear Mr. Denton:

My letter of August 1, 1984 submitted a description and justification for proposed piping seismic analysis changes for the McGuire Nuclear Station to adopt damping values and spectra shifting methods for piping systems recommended by the task group of the Pressure Vessel Research Committee (PVRC) of the Welding Research Council. The proposed changes reduce the excessive conservatism in current seismic design requirements and would allow use of fewer snubbers and other seismic restraints on modified piping at McGuire and would allow removal of some existing snubbers and seismic restraints to reduce inservice inspection, maintenance, and access/interference problems. Since these changes will be used (once approved) for any modifications performed in the future, and for optimization to remove snubbers on existing piping and on new piping to minimize use of snubbers, the alternative criteria could potentially be applied to all systems at McGuire.

Please find attached a revised description/justification for the proposed changes containing additional information/clarification. This revision addresses questions resulting from the NRC staff's review of the August 1, 1984 submittal which were previously discussed via telecon between Mr. P. B. Nardoci and M. S. Sills (Duke Power Company) and members of your staff on October 16 and 18, 1984. The delay in responding to the questions was due to difficulty in obtaining a copy of code case N-411 (which is not yet published) for review. Timely review/approval is requested for reasons outlined in the August 1, 1984 submittal.

Should there be further questions concerning this request, please advise.

Very truly yours,

H.B. Tucker / BS

Hal B. Tucker

PBN/mjf

Attachment

A001
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cc: Mr. J. P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
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Mr. Darl Hood
Division of Project Management
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Mr. W. T. Orders
Senior Resident Inspector
McGuire Nuclear Station

DUKE POWER COMPANY
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2
PROPOSED PIPING SEISMIC ANALYSIS CHANGES

Damping Values for Dynamic Analysis of Piping

As an option to the damping values currently given in the FSAR 3.7.1.3 for response spectra analysis, the values given in Code Case N-411 may be used. This option may be used for reanalysis of any system designed for seismic loads for either modifications or support/snubber optimization. Either the damping values currently given in the FSAR (3.7.1.3) or Code Case N-411 will be selected for each analysis. No combination of the two damping criterias will be used. Code Case N-411 damping values will not be used for time history analysis. Seismic displacements are reviewed to assure calculated displacements can be accommodated.

Justification:

These damping values have been recommended by the PVRC Task Group on Damping Values based on extensive review of available data. There is still conservatism which can be considered as additional justification for use of increased damping values. These damping values reduce excessive conservatism in current requirements and will result in significant reduction in predicted pipe response. This will allow elimination of snubbers on existing piping and use of fewer snubbers and other seismic supports on piping added or modified by plant modifications. This will result in reduced cost and radiation exposure for Inservice Inspection of snubbers and increased overall reliability of the piping due to reduced probability of snubber failure and reduced thermal stress in new and modified piping due to fewer seismic supports (Ref. NUREG/CR 3718).

Response Spectra Shifting

As an alternative to the method of spectra broadening described in the FSAR 3.7.2.8 for piping analysis, an envelop of the response of the piping system to shifted floor response spectra may be used. The method to be used is described in the Code Case N-397 and the Summer 1984 addendum to Section III, Appendix N of the ASME Boiler and Pressure Vessel Code. This option may be used for reanalysis of any system designed for seismic loads for either station modifications or support/snubber optimization.

Justification:

The floor response spectra for McGuire structures are characterized by a single dominant peak; therefore, the application of this method is straightforward.

The proposed change reduces the excessive conservatism in the current response spectra analysis and will result in fewer snubbers and other seismic supports. The response of the piping using this method has been compared with the response calculated using time history analysis for typical piping models by both Duke Power and Lawrence Livermore National Lab (reference NUREG/CR-3428). Both studies conclude that the proposed method is conservative compared to time history analysis, but reduces the conservatism of the current spectra broadening method.