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FEB 22 1983

Docket No. 50-305

Mr. C. W. Giesler, Vice President
Nuclear Power
Wisconsin Public Service Corporation
Post Office Box 1200
Green Bay, Wisconsin 54305

Dear Mr. Giesler:

We have completed our preliminary review of your submittals in response to Bulletin 80-11, Masonry Wall Design, for the Kewaunee Nuclear Power Plant. We find that we need the information identified in the enclosure to this letter in order to complete our review. Please provide this information within 60 days from the receipt of this letter.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by:
S. A. Varga

Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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OFFICE	ORB 1	ORB 1					
SURNAME	MGrotenhuis	rs S. Varga					
DATE	2/8/83	2/27/83					

Mr. C. W. Giesler
Wisconsin Public Service Corporation

cc: Steven E. Keane, Esquire
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Resident Inspectors Office
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James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

TECHNICAL EVALUATION

Based on the Licensee's response to IE Bulletin 80-11, a technical evaluation was conducted. The Licensee's response must be more thorough to facilitate a proper technical evaluation. A more detailed discussion of the Licensee's reevaluation criteria is needed. The discussion should cover in detail the analytical approach for determining seismic loads and should address such topics as load combinations and interstory drift effects. Also, sufficient justification has not been provided for certain allowable stresses. Before a final technical evaluation can be made, the Licensee is required to provide the following information:

1. With respect to loads and load combinations, the Licensee's submittals [2 - 6] mention only that the primary loads imposed on the masonry walls are seismic loads. Indicate the load combinations used in the reevaluation of masonry walls at the Kewaunee plant and justify the difference between these and the load combinations specified for Class I structures in Appendix B, Table B.6-1, of the Final Safety Analysis Report (FSAR).
2. Indicate how earthquake loads in three directions were considered in the analysis.
3. The Licensee does not mention tornado or impact loads in any of its submittals [2-6]. Indicate whether any walls are subject to tornado or impact effects. If so, provide sample calculations for tornado and impact analysis.
4. The natural frequencies of masonry walls are subject to uncertainty due to variations in mass, materials, and other parameters. Indicate how these uncertainties were accounted for in the evaluation of the walls' frequencies at the Kewaunee plant.
5. If allowable stresses were increased by 50%, as suggested by Reference 3, justify this increase for masonry shear, since the SEB criteria [7] allow an increase of only 30% under abnormal conditions. If any existing test data are used to justify this increase, the Licensee is required to discuss the applicability of these tests to the masonry walls at the Kewaunee plant with particular emphasis on the following:
 - boundary conditions
 - nature of loads
 - size of test walls
 - type of masonry construction (block and mortar type, grouted or ungrouted).

The Licensee is also requested to identify the walls that would not be qualified if SEB criteria were used.

6. Provide evidence that the contributions of higher modes of vibration are about 5% of the total response and need not be considered in the analysis, as stated in Reference 3, Section 2.0.
7. Indicate if the construction practice at the Kewaunee plant conformed to the provisions specified in ACI 531-79 [9] for the Special Inspection Category. Also indicate whether quality assurance/quality control information is available to support this categorization.
8. Justify the use of 50 psi for allowable masonry shear stress (no shear reinforcement), as specified in Reference 3, Section 3.0. ACI 531-79 [9] lists allowable masonry shear for flexural members with no shear reinforcement as $1.1 \sqrt{f'_m}$ which is only 40 psi when f'_m equals 1350 psi.
9. None of the Licensee's submittals [2-6] mention whether the masonry walls at Kewaunee are stack or running bond. If any stack bond wall exist provide sample calculations of a typical stack bond wall.
10. Interstory drift effects were not mentioned in any of the Licensee's submittals [2-6]. Indicate how interstory drift effects were considered in the analysis of masonry walls. Provide any criteria that may have been used to evaluate interstory drift effects and justify such use.
11. The ACI 531-79 Code [9] specifies that the minimum area of reinforcement in a wall in either direction, vertical or horizontal, shall be 0.0007 (0.07%) times the gross cross-sectional area of the wall and the minimum total area of steel, vertical and horizontal, shall not be less than 0.002 (0.2%) times the gross cross-sectional area. The Licensee is requested to clarify whether the reinforced walls at the Kewaunee plant meet these requirements.

REFERENCES

1. IE Bulletin 80-11
Masonry Wall Design
NRC, 08-May-81
2. E. R. Mathews
Letter to J. G. Keppler, NRC. Subject: IE Bulletin 80-11, Masonry
Wall Design - Kewaunee Plant
Wisconsin Public Service Corp., 09-Jul-80
3. E. R. Mathews and D. W. Sauer
Letter to G. Fiorelli, NRC. Subject: IE Bulletin 80-11, Masonry
Wall Design - Kewaunee Nuclear Power Plant
Wisconsin Public Service Corp., 23-Sep-80
4. E. R. Mathews
Letter to J. G. Keppler, NRC. Subject: Response to IE Bulletin
80-11 for Kewaunee Plant
Wisconsin Public Service Corp., 08-Dec-80
5. E. R. Mathews
Letter to J. G. Keppler, NRC. Subject: Notarization of previous
submittals regarding IE Bulletin 80-11
Wisconsin Public Service Corp., 23-Dec-80
6. E. R. Mathews
Letter to G. Fiorelli, NRC. Subject: Kewaunee Nuclear Power Plant -
IE Bulletin 80-11
Wisconsin Public Service Corp., 26-Jan-81
7. SEB Criteria for Safety-Related Masonry Wall Evaluation
Structural Engineering Branch of the NRC, 00-Jul-81
8. Uniform Building Code
International Conference of Building Officials, 1979
9. Building Code Requirements for Concrete Masonry Structures
Detroit: American Concrete Institute, 1979
ACI 531-79 and ACI 531-R-79

