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JUL 13 1982

Docket Nos. 50-315
and 50-316

Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
Post Office Box 18
Bowling Green Station
New York, New York 10004

Dear Mr. Dolan:

SUBJECT: IE BULLETIN 80-11 MASONRY WALL CONSTRUCTION

In our review of D. C. Cook 1 & 2 responses to IE Bulletin 80-11, we have identified additional information which we will need in order to complete our review. Franklin Research Center under contract to the NRC has developed the enclosed request for additional information. We request that you provide the information by August 23, 1982.

This request for information is in accordance with the OMB Clearance No. 3150-0065, which expires May 31, 1983.

Sincerely,

Original signed by:
S. A. Varga

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

Enclosure:
As stated

cc: See next page

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DATE	7/12/82	7/ /82	7/13/82				

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-9

Mr. John Dolan
Indiana and Michigan Electric Company

cc: Mr. Robert W. Jurgensen
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The Honorable Tom Corcoran
United States House of Representatives
Washington, D. C. 20515

James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

TECHNICAL EVALUATION

An evaluation based on the information available in References 2, 3, 4, and 5 was conducted and the following concerns were identified: the Licensee response to IE Bulletin 80-11 must be more thorough to facilitate proper evaluation. A more detailed discussion of the Licensee's reevaluation criteria is needed. The discussion should cover in detail all analytical approaches and assumptions, and address such topics as allowable stresses and load combinations. Before a final technical evaluation report can be issued, the Licensee is requested to provide the following information:

1. Describe the assumptions, modeling techniques, and procedures used in the analysis.

2. Specify the number of modes of vibration considered in the seismic analysis and show how the effect of higher modes of vibration has been considered.

3. Indicate how earthquake forces in three directions were considered in the analysis.

4. Indicate how the seismic analysis accounted for variations of frequency due to uncertainties in mass, materials, and other parameters used.

5. Specify material types used and provide values of allowable stresses for masonry, mortar, grout, and reinforcement.

6. Regulatory Guide 1.61 allows 4% damping for the operating basis earthquake (OBE) and 7% dumping for the safe shutdown earthquake (SSE). Provide the damping values used in the analysis and justify them if they are higher than those allowed in Regulatory Guide 1.61.

7. Provide any increase factors that may have been used for allowable stresses under abnormal conditions. If they are higher than those factors listed in the SEB criteria [6], provide justification. The SEB factors are listed below by type of stress.

Axial or flexural compression	2.5
Bearing	2.5
Reinforcement stress except shear	2.0 but not to exceed 0.9 fy
Shear reinforcement and/or bolts	1.5
Masonry tension parallel to bed joint	1.5
Shear carried by masonry	1.3
Masonry tension perpendicular to bed joint	
reinforced masonry	0
unreinforced masonry	1.3

8. Indicate the boundary conditions used for analyzing the masonry walls and provide justification for those boundary conditions.

9. Indicate if the cracking of sections of the walls was given proper consideration in the analysis.

10. Provide information on loads and load combinations applicable to masonry walls.

11. Describe how interstory drift (both in-plane and out-of-plane) was accounted for.

12. Provide information on construction practices and the availability of relevant quality assurance/quality control records to justify the use of allowable stresses applicable to the Special Inspection Category.

13. Indicate whether the walls are stack bond or running bond. If any stack bond wall exists, provide sample calculations to obtain moment and shear stress of a typical wall.

14. Indicate how wall attachments (equipments, pipes) were considered in the analysis.

15. Provide sample calculations for:

    - o Block pullout analysis
    - o Missile impact.

16. With reference to the multiple wythes, clarify whether the collar joint strength was used in the analysis. If so, justify the values used. Also, on page 2 of Reference 2, the Licensee explained that when duro-wall reinforcing has not been used, the wall strength is a multiplication of a single wythe. Explain how shear and tension can be transferred along the collar joint so that the wall strength is a multiplication of single wythe strength. Also, provide a sample calculation.

17. Indicate if any nonlinear technique was used in the analysis. If so, provide justification for its use. If any existing test data are used to justify the technique, the applicability of the tests should be discussed for the following areas:

    Nature of the loads
    Boundary conditions
    Materials used
    Wall sizes
    Amount and distribution of reinforcement.

18. Provide the number of walls which are unreinforced. Also, provide a sample calculation illustrating how tension, shear, and displacement were obtained.

19. Provide detailed drawings of the modifications used. Also provide a sample calculation to illustrate that the modified wall will be qualified under the working stress design condition.

5. REFERENCES

1. "Masonry Wall Design"
   NRC, 08-May-81
   IE Bulletin 80-11

2. G. P. Maloney (Indiana & Michigan Electric Company)
   Letter with attachment to J. G. Keppler (NRC)
   Subject: Response to IE Bulletin 80-11, Masonry Wall Design
   July 10, 1980

3. R. S. Hunter (Indiana & Michigan Electic Company)
   Letter to J. G. Keppler (NRC)
   Subject: Interim Supplemental Response to IE Bulletin 80-11
   March 20, 1981

4. R. S. Hunter (Indiana & Michigan Electric Company)
   Letter to J. G. Keppler (NRC)
   Subject: Supplemental Response to IE Bulletin 80-11
   January 14, 1981

5. R. S. Hunter (Indiana & Michigan Electric Company)
   Letter with attachments to James G. Keppler (NRC)
   Subject: Final Report of the Description of Design Modifications and Plant Changes
   October 30, 1981

6. Standard Review Plan, Section 3.8.4, Appendix A
   "Interim Criteria for Safety-Related Masonry Wall Evaluation"
   NRC, July 1981

7. Uniform Building Code
   International Conference of Building Officials, 1979

8. "Building Code Requirements for Concrete Masonry Structures"
   American Concrete Institute, 1979
   ACI 531-79 and Commentary ACI 531R-79

9. Standard Review Plan, Section 3.7.2
   "Seismic System Analysis"
   NRC, July 1981