DCS .MS-016

AUG 5 1982

Docket No. 50-335

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Dr. Robert E. Uhrig
Vice President
Advanced Systems & Technology
Florida Power & Light Company
P. O. Box 529100
Miami, Florida 33152

Dear Dr. Uhrig:

Re: Masonry Wall Design (IE Bulletin 80-11) Request for Additional Information at St. Lucie, Unit No. 1

We and our contractor, Franklin Research Center, have been reviewing your February 11 and November 9, 1981 submittals addressing masonry wall design at St. Lucie, Unit No. 1. We find that the enclosed request for additional information is needed to complete our review.

In recent discussions with your staff (Mr. Ronald Stevens), a mutually agreed upon schedule for your submittal of this requested information has been determined. Therefore, our review schedule with Franklin has been revised to expect your response within 60 days from the date of this letter.

The information requested affects fewer than 10 respondents; therefore OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by
Robert A. Clark

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Enclosure
As stated

cc w/enclosure:
See next page

OFFICE	ORB #3	ORB #3	ORB #3	ORB #3	ORB #3		
SURNAME	P. Kreutzer	D. Wagner	E. Conner	C. Trammell	R. Clark		
DATE	8/12/82	8/14/82	8/15/82	8/15/82	8/5/82		

Florida Power & Light Company

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE, UNIT NO. 1

DOCKET NO. 50-335

3.3 TECHNICAL EVALUATION

Based on the Licensee's reevaluation criteria, a technical evaluation was conducted. In general, the Licensee's response to IE Bulletin 80-11 was satisfactory; however, additional information is required to permit a proper final technical evaluation. It is noted that sufficient information has not been provided to justify certain increase factors for allowable stress at St. Lucie Unit 1. In addition, conclusive justification is needed for the application of special analysis techniques, specifically "arching analysis," "yield-line theory," and "plastic design," to the masonry walls at St. Lucie Unit 1. Before a final technical evaluation report can be made, the Licensee is requested to provide the following information:

1. Indicate the number of walls of the stack bond type and provide a sample calculation to obtain moment and shear stresses of a typical stack bond wall.

2. A sample calculation to indicate how the effect of higher modes of vibration is considered in the analysis.

3. With respect to Table 1 of Reference 2, justify by any existing test data the values for allowable shear and tension of collar joints.

4. With reference to Section V, Table 1 of Reference 2, justify the use of an increase factor of 1.7 for tension normal to bed joint. SEB criteria [5] allow only 1.3. If the Licensee intends to use any existing test data to justify this increase factor, the Licensee is requested to discuss the applicability of these tests to the masonry walls at the plant with particular emphasis on the following: boundary conditions, type of loads, sizes of walls, and type of masonry construction (block type, grouted, or ungrouted).

5. a. In Reference 2, the Licensee indicated that "yield-line theory," "plastic design," and "arching analysis" have been used to qualify some of the masonry walls. The NRC, at present, does not accept the application of these methods to masonry walls in nuclear power plants in the absence of conclusive evidence to justify this application. Before any conclusion can be made about these methods, the Licensee is requested to provide any existing test data to justify the use of each technique mentioned

above. 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.

b. The Licensee is also requested to indicate the number of walls which were qualified by each method and provide the resulting stresses and displacements for these walls.

c. Provide a sample calculation illustrating how stresses and displacement were calculated by each method (yield-line theory, plastic design, and arching analysis).

6. Provide sample drawings of wall modifications, and clarify whether the modified walls were qualified under working stress conditions.

7. The Licensee reported that one of the walls missing top supporting angles was inaccessible during normal plant operation, and that it would be repaired during the 1981 refueling outage. Indicate the current status of this wall, as well as the status of modifications of the other walls.

8. Provide a sample calculation illustrating how stresses were calculated for a multi-wythe wall.

9. Provide a sample drawing of a finite element model to illustrate how openings and attachments were considered in the model.

10. Indicate the critical damping value used for the operating basis earthquake (OBE). Justification should be given if it is higher than 4% as specified in Regulatory Guide 1.61.

REFERENCES

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

2. R. E. Uhrig
   Letter to J. P. O'Reilly, NRC.
   Subject: IE Bulletin 80-11 -
   Reevaluation of Masonry Walls at St. Lucie Unit 1 - Final Report (Attached)
   Florida Power & Light Co., 11-Feb-81
   L-81-45

3. A. D. Schmidt
   Letter to J. P. O'Reilly, NRC. Subject: Reportable Occurence 335-61-03, St. Lucie Unit 1, January 23, 1981
   Florida Power & Light Co., 20-Mar-81
   PRN-LI-81-138

4. R. E. Uhrig
   Letter to J. P. O'Reilly, NRC. Subject: Addendum A to Final Report on IE Bulletin 80-11, November 9, 1981 (Attached)
   Florida Power & Light Co., 7-Dec-81

5. Interim Criteria for Safety-Related Masonry Wall Evaluation
   NRC, 00-Jul-81
   SRP 3.8.4, Appendix A

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

7. Building Code Requirements for Concrete Masonry Structures
   Detroit: American Concrete Institute, 1979
   ACI 531-79 and ACI 531-R-79