



MISSISSIPPI POWER & LIGHT COMPANY

Helping Build Mississippi

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PRODUCTION DEPARTMENT

August 28, 1981



U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
Files 0260/0862
Transmittal of Responses to NRC
SER Open Items
AECM-81/333

Based on our meeting with the NRC Structural Engineering Branch on August 27, 1981, Mississippi Power & Light Company is submitting the enclosed materials as responses to your requests for additional information. Be advised that attachment 4 on Masonry Walls supersedes our previous response which was submitted via AECM-81/316, dated August 24, 1981.

If you have any questions or require further information, please contact this office.

Yours truly,

L. F. Dale
Manager of Nuclear Services

DWF/JDR:dn

Attachments (See Next Page)

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MISSISSIPPI POWER & LIGHT COMPANY

AECM-81/333

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- Attachments:
1. SEB SER Open Item - Soil-Structure Interaction
 2. SEB SER Open Item - Allowable Tangential Shear
 3. SEB SER Open Item - Damping Values for Cable Trays
 4. SEB SER Open Item - Masonry Walls
 5. SEB SER Open Item - Impact of Extension of New Madrid Fault

cc: Mr. N. L. Stampley (w/o)
Mr. G. B. Taylor (w/o)
Mr. R. B. McGehee (w/o)
Mr. T. B. Conner (w/o)

Mr. Victor Stello, Jr., Director (w/o)
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

SER Open Items

Seismic Analysis- Soil Structure Interaction - (SEB)

Response

In a meeting with NRC's Structural Engineering Branch on August 27, 1981, MP&L made the following commitment to resolve NRC concerns in the area of seismic analysis soil-structure interaction.

A finite element seismic (FLUSH) analysis (FEM) will be performed for the containment, auxiliary, control and diesel generator buildings. Appropriate soil properties necessary as input to the analysis will be determined based on existing soils data presented in the FSAR. No further subsurface exploratory work is necessary; however, the basis for seismic soil property determination used in the analysis will be provided. Free field input motions will be in accordance with Regulatory Guide 1.60 with damping values provided in Regulatory Guide 1.61. Ground motion will be applied in the free field at the foundation level of the structures.

After completion of the analyses for each building, acceleration response spectra at key levels will be developed and compared with existing EHS lumped mass response spectra. The SEB position will then be applied to these results in order to assess the impact of the use of both methods of analyses to piping, equipment and components.

The FEM/EHS comparison of ARS will be used as a basis for design qualification of structures, systems and components at Grand Gulf.

NRC-SEB stated that if the FEM/EHS envelope exceeded the Grand Gulf EHS ARS envelope by more than 20%, modifications to equipment or strengthening of structures may be required. If the EHS envelope is exceeded by less than 20%, a discussion of conservatisms in the analyses will be provided. An explanation of how major differences, if observed, will be disposed will be provided to NRC.

The above stated analyses and comparisons will be completed and submitted to NRC by March 1, 1982. General statements regarding any modifications and associated schedules will also be provided. Specific modifications necessary will be completed before plant restart after the first regularly scheduled refueling outage.

SER Open Items

Allowable Tangential Shear - (SEB)

Response

In a meeting with NRC's Structural Engineering Branch on August 27, 1981, MP&L made the following commitments to resolve the NRC concerns regarding drywell tangential shear.

A technical justification of the high allowable concrete shear stress will be submitted following a research of available test data completed by various independent agencies to predict this allowable shear stress. The response will be submitted by September 14, 1981.

Damping Values for Cable Trays - (SEB)

Response

In a meeting with NRC's Structural Engineering Branch on August 27, 1981, MP&L made the following commitments to resolve the NRC concerns regarding cable tray damping.

Responses to the six questions informally issued by the Structural Engineering Branch on "Cable Tray and Conduit Raceway Seismic Test Program," Report 1053-21.1-4, will be addressed by September 14, 1981. The use of a maximum of 15% damping for cable trays which complies with the above referenced test report will also be justified. The impact of using the damping values of Regulatory Guide 1.61 as opposed to the damping values actually used as a result of the test report will be assessed. This information will also be provided by September 14, 1981.

SER Open Item

Masonry Walls - (SEB)

Response

Attached is the revision to FSAR subsection 3.8.4.4.5 indicating that the design of CMU walls in Category I structures meets the intent of the NRC's "SEB Interim Criteria for Safety-Related Wall Evaluation," Revision 1. This revision will be included in the next available amendment.

Subsequent to the issuance of the NRC's information request on Category I masonry walls, dated April 21, 1980, IE Bulletin 80-11 was originated. Although this bulletin applies only to power reactor facilities with an Operating License, we initiated a re-evaluation of concrete masonry walls in Category I structures at Grand Gulf. To date, the following work has been completed:

1. A comprehensive field survey was conducted between November 1980, and January 1981. This survey identified all safety-related items attached to or located in proximity to masonry walls at that time. In addition, data was recorded to determine the wall geometry, location of penetrations and type of closures, location and magnitude of attachment loads, type of wall support, and any additional information which could affect the structural integrity of the walls.
2. Upon completion of the survey, the information obtained was used to re-evaluate the ability of these walls to perform their intended functions during all postulated loadings, without impairing the integrity of Category I systems and components attached to or in proximity to these walls. Criteria were generated for the re-evaluation, which consider present state-of-the-art analysis and design techniques, as well as licensing commitments contained in the FSAR.
3. Any masonry walls which did not conform with the criteria were modified as required, and appropriate design drawings were issued to implement these modifications.

During the fall of 1981, a second field survey will be initiated. The purpose of this survey is to identify any additional wall attachments or changes in wall configurations subsequent to the first survey. The walls will then be re-evaluated as necessary, and modification designs, if required, will be issued.

In December, 1981, we will submit a formal report on the re-evaluation of concrete masonry walls at Grand Gulf. This report will contain all information requested in IE Bulletin 80-11, as well as a comparison of the Grand Gulf masonry wall design criteria with Revision 1 of the NRC's "SEB Interim Criteria for Safety Related Masonry Wall Evaluation" (July 1981).

MP&L will complete any modifications necessary, based upon NRC's review of the final CMU wall report, prior to restart after the first regularly scheduled refueling outage.

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resist the most critical loading case as well as tornado generated missiles. All exterior walls are designed as shear walls to transmit lateral loads to the foundation. All vertical loads from roof and floor slabs are transmitted to the foundation through the exterior walls and interior steel columns.

The control building is designed as a sealed building for tornado pressure drop to comply with the extreme environmental condition. A design pressure of 3 psi was used for all exterior walls. During construction of the Unit 2 side of the control building and when Unit 1 is operating, there may be a select number of penetrations that will be left open for cable pulling operations. The structural effects of the tornado pressure drop, while these penetrations are kept open, were investigated. The resulting differential wind pressures were used for the design of the interior walls. Concrete missile barriers 2 feet thick are provided to protect all louvers and other vulnerable openings against tornado generating missiles.

The steel and concrete elements of the control building were designed using classical methods of analysis. The composite steel beams and columns were designed elastically for the loads and load combinations of subsection 3.8.6.3 in accordance with the Specification for Design, Fabrication and Erection of Structural Steel for Buildings, AISC, 1969. The concrete walls, slabs and foundation were designed using ultimate strength technique for loads and load combinations of subsection 3.8.6.2 in accordance with the Building Code Requirements for Reinforced Concrete, ACI-318-71. Concrete block masonry unit (CMU) construction was used for interior walls. These are non-load bearing walls (with a few exceptions where walls support roofs over isolated rooms). The design and construction of these walls were performed in accordance with "National Concrete Masonry Association" (NCMA) Specification (1970), with supplemental allowable stresses and analysis techniques meeting the intent of the NRC's "SEB Interim Criteria for Safety-Related Masonry Wall Evaluation," Revision 1, whenever the safety of seismic Category I systems and components is involved. The Uniform Building Code earthquake criteria for Zone 1 was used in the design of non-Category I CMU walls.

3.8.4.4.6 Diesel Generating Building

The diesel generator building has been designed as a monolithically constructed, reinforced concrete structure supported on a structural backfill foundation. The analysis techniques include classical beam and plate theory. The design was performed in accordance with ACI 318-71, Building Code Requirements for Design, Fabrication and Erection of Structural Steel for Buildings, AISC, 1969, for steel structures.

The diesel generator building roof was designed as composite beams with two-foot thick concrete slabs resting on steel beams. The concrete roof serves as a horizontal diaphragm which transfers.

SER Open Items

Impact of Extension of New Madrid Fault - (GSE/SFB)

Response

In a meeting with NRC's Structural Engineering Branch and a subsequent telephone conversation with the Geosciences Branch on August 27, 1981, MP&L made the following commitments to resolve the NRC concerns regarding the effect on Grand Gulf seismic design of an extension of the New Madrid Fault. A commitment to accept the extension of the fault will not be made; however, MP&L agreed to develop a Grand Gulf design spectrum curve assuming the fault extension and to compare this curve to the one developed by the NRC and issued to MP&L in the draft 2.5.2 SER Section. A comparison of the two curves will be made and an evaluation will be provided by September 11, 1981, to assess any effects to the Grand Gulf seismic design basis.