MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

March 12, 1982

NUCLEAR PRODUCTION DEPARTMENT

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
File: 0260/L-814.1/M-001.0
Re: AECM-82/95
Response to Seismic Qualification Review Team Questions
AECM-82/74

Mississippi Power & Light Company (MP&L) is providing the following information in response to questions raised by the Seismic Qualification Review Team (SQRT) during a telephone confe.nce call on January 25, 1982.

This information is also in support of concerns identified in the rand Gulf Safety Evaluation Report as Outstanding Issue 1.9(6).

1. Concern

Provide the following information in regard to computer code "F-1":
a) Description of GE Computer Code SAP4G07
b) Mathematical model used during finite element analysis

Response

The following information is provided:
Attachment 1: FSAR Pages 3.9-8 & 3.9-17; describes SAP4G07 as a verified GE computer code.
Attachment 2: NEDO-10909, GE SAP4G07 user's manual; describes how to use the GE SAP4G07 computer code.
Attachment 3: Finite Element Analysis; describes the mathematical model used by GE to perform the finite element analysis on the fuel transfer system hatch.

B001 1/1

Limited Dist. Encl. to:
PDR
LPDR
NSIC
NTIS
PM
EQB
REG Files

2. Concern

Provide the following information for control room panel H13-P601:
a) copy of DRF # A00-696
b) copy of FDDR implementing field fix on controller

Response

The following information is provided:

a) Attachment 4: FDDR # JB1-1644, Rev. 0; Field fix of Controller E51-R600, H13-P601.

b) DRF # A00-696; Wyle Test Report #58459, "Seismic Testing of Two Reactor Mode Switch Assemblies". DRF # A00-696 is considered by the General Electric Company to be proprietary information. As such, DRF # A00-696 is being provided under separate cover to the NRC in Mississippi Power & Light Company letter AECM-82/95.

3. Concern

Issue concerns the pressure indicator switch Model No. 510DU237028. The NRC indicated that their review of Environ Laboratories Engineering Report No. 8849 test results showed that the test unit was returned to Rosemount Inc. for further evaluation. NRC reviewer asked (1) why was the test unit sent back to Rosemount after the 11-g vibration test and (2) what did Rosemount do with the returned units.

Response

Attachment 5 provides MP&L's response to the questions raised by SQRT.

4. Concern

Issue concerns the RHR solenoid valve Model No. 75GG001. The NRC reviewer asked that in view of the fact that several natural frequencies below 33 Hz were found, how do we address multi-mode and multi-frequency concerns in the report as the tests performed were single frequency and single axis.

Response

Attachment 6 provides MP&L's response to the question raised by SQRT.

5. Concern

Provide information on modification made to Limitorque Actuators for hydrodynamic loads.

Response

Limitorque Test Report B0084 is provided as Attachment 7. Attachment 7 contains a picture of the modified seismic bracket for the Limitorque actuators as well as a copy of Test Report No. B0084. The only Limitorque actuators requiring modification for seismic consideration are the SMB/HBC models mounted on Henry Pratt butterfly valves (Specifications 9645-M-257.0/M-258.0) which are subjected to hydrodynamic loads. Per Limitorque Test Report No. B0084 (includes Acton Lab. Report No. 15780),

special high frequency brackets were installed prior to testing to replace the stock bracket which connects the motor and gear box. The actuators successfully passed the hydrodynamic loads vibration testing. The Limitorque actuators for gate and globe valves (specifications 9645-M-242.0 and 9645-M-251.0) did not require modification and successfully passed the hydrodynamic loads vibration testing. This is documented in Limitorque Test Report No. B0085 (includes Acton Lab Report No. 15780-1).

6. Concern

HPCS Service Water Pumps, Specification No. 9645-M-087.0. The SQRT personnel raised questions in regard to the methodology used in performing the analysis on the HPCS service water pump.

Response

The following information and actions have been taken:

a) A conference call between the NRC, Nutech, Bechtel and MP&L was held on February 2, 1982.
b) The conference call resulted in the conclusion that the HPCS service water pump was qualified.
c) The NRC requested technical information on the HPCS service water pump be provided to them in order they may make an independent review of the analysis.
d) Attachment 8 provides general information on the HPCS service water pump.
e) Proprietary arrangement has been worked out between the NRC and Gould in order for the NRC to obtain proprietary shop drawings and information from Gould Pump, Inc.
f) MP&L has forwarded a letter to Gould requesting the proprietary information be sent to the NRC.

7. Concern

MP&L committed to stiffen the 40 MW fan support channels with bracing to eliminate the potential for low frequency. The NRC requested they be provided with a copy of the design used to stiffen the 40 MW fan and also a copy of the analysis that was performed to verify the design.

Response

A copy of the design and analysis for the 40 MW fan modification is provided as Attachment 9.

8. Concern

MP&L committed to strengthening the ASCO Solenoid Valve mounting plates. The NRC requested they be provided with a copy of the design used to strengthen the mounting plates and also a copy of the analysis that was performed to verify the design.

Response

Copies of the Field Change Notices (FCN) for strengthening the ASCO Solenoid Valve Mounting plates are provided as Attachment 10. MP&L will forward to the NRC SQRT a copy of the analysis performed on the design change implemented by the FCN's in Attachment 10 by April 15, 1982.

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

Yours truly,

L. F. Dale
Manager of Nuclear Services

RAB/SHH/JDR:rg

Attachments:
1. FSAR Pages 3.9-8 and 3.9-17
2. GE SAP4G07 Computer Code User's Manual (NEDO-10909)
3. Finite Element Analysis Model
4. FDDR # JB1-1644
5. Response to Pressure Indicator Switch Questions
6. Response to RHR Solenoid Valve Questions
7. Limitorque Test Report L0084
8. HPCS Service Water Pump Technical Information
9. 40 MW Fan Modification Design and Analysis
10. ASCO Solenoid Valve Mounting Plate Field Change Notices

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

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

3.9.1.2 Computer Programs Used in Analysis

3.9.1.2.1 Computer Programs used for NSSS Equipment

The following subsections discuss computer programs used in the analysis of specific components. (Computer programs were not used in the analysis of all components; thus, not all components are listed.)

The NSSS programs can be divided into two categories:

GENERAL ELECTRIC (GE) PROGRAMS

The verification of the following GE programs has been performed in accordance with the requirements of 10 CFR 50, Appendix B. Evidence of verification is documented in GE Design Record files.

(a)	SEISM	(m)	TSFOR
(b)	STRESINT	(n)	LUGST
(c)	MASS	(o)	PDA
(d)	DYSEA	(p)	PISYS
(e)	HEATER	(q)	SAP4G
(f)	FAP-71	(r)	WBHFN
(g)	CREEP-PLAST	(s)	ED-6
(h)	ANSYS	(t)	ED-8
(i)	ASSIST	(u)	GEAPL
(j)	CRDSS	(v)	SPECA
(k)	ANSI	(u)	ASHSD
(l)	RVFOR	(v)	FTFLG

VENDOR PROGRAMS

The verification of the following vendor programs is assured by contractual requirements between General Electric and the vendors. Per the contractual requirements, the verification of these proprietary programs used in the design of N-stamped equipment is in full compliance with 10 CFR 50, Appendix B.

Byron-Jackson Program	Recirculation Pump

DSER 3.9.1-1

53

pump casing for the various loading conditions imposed by thermal and mechanical loads during plant operating and postulated conditions.

In general, the finite element techniques are used to solve temperature distribution heat transfer transient analysis problems, and to perform stress analysis for various thermal and mechanical loadings by using the same finite element model representing the pump body. The output of this program is in the form of temperature profiles, deflections, and stresses at the modal points of the finite element idealization of the pump structure.

Accuracy of the computer program methods is demonstrated by comparison with selected sample problems which lend themselves to alternate computation methods to provide closed-form analytical solutions.

3.9.1.2.1.5 ECCS Pumps and Motors

The following are the computer programs used in the dynamic analysis to ensure the structural and functional integrity of the ECCS pumps and motor assemblies.

53

3.9.1.2.1.5.1 Structural Analysis/SAP4G

SAP4G is used to analyze the structural and functional integrity of the ECCS pump/motor systems. This is a general structural analysis program for static and dynamic analysis of linear elastic complex structures. The finite element displacement method is used to solve the displacements and stresses of each element of the structure. The structure can be composed of an unlimited number of three-dimensional truss, beam, plate, shell, solid, plate strain-plane stress and spring elements that are axisymmetric. The program can treat thermal and various forms of mechanical loading. The dynamic analysis includes mode superposition, time-history, and response spectrum analysis. Seismic loading and time-dependent pressure can be treated. The program is versatile and efficient in analyzing large and complex structural systems. The output contains displacements of each nodal point as well as stresses at the surface of each element.

3.9.1.2.1.5.2 Effects of Flange Joints Connections/FTFLG

The flange joints connecting the pump bowl casings are analyzed using FTFLG. This program uses the local forces and moments