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

NUCLEAR PRODUCTION DEPARTMENT

June 11, 1982

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 0260/0756
Equipment Survivability
AECM-82/265

Mississippi Power & Light Company (MP&L) has evaluated the equipment identified in the MP&L Equipment Survivability Program (AECM-82/26, dated January 19, 1982) as to the effects of pressure. The evaluation as presented in the enclosed attachment has shown that there are no deleterious effects on equipment from the pressure resulting from the calculated hydrogen burn analysis previously submitted by MP&L.

It is our understanding that this completes the efforts in the equipment survivability area; and, as satisfactory results have been achieved, no further action is required by MP&L.

Yours truly,

L. F. Dale
Manager of Nuclear Services

RMS/SHH/JDR/jgt
Attachment
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/a)
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. J. P. O'Reilly, Regional Administrator (w/a)
Office of Inspection & Enforcement
Region II
101 Marietta Street, N.W., Suite 3100
Atlanta, Georgia 30303

A048

Concern: Determine the ability of essential equipment located inside containment to withstand the 24 psig pressure spike resulting from the conservatively induced containment hydrogen burn which occurs at the end of the base case SORV scenario submitted by MP&L letters AECM-81/505 dated December 21, 1981 and AECM-82/26 dated January 19, 1982.

Response:

1. Valves - Motor-operated and air-operated valves located inside containment are qualified to pressures (on the order of 100 psig) well in excess of the postulated burn pressures. Limit/position indication switches associated with these valves are qualified to a maximum pressure of 75 psig. Air-operated valves would experience slower closure times and reduced thrust for closure if they operated at the postulated burn pressure; however, these valves will have performed their function within the first few minutes after the start of an accident well before the onset of hydrogen combustion.

2. Containment penetrations, locks, and hatches - As previously discussed in AECM-81/336 dated August 31, 1981 and AECM-82/117 dated April 1, 1982 the ultimate pressure retaining capacities of containment hatches and air locks are:

Hatch or Air Lock	Calculated Pressure (psig)
Containment Equipment hatch	206.5
Lower Containment Personnel Air Lock	77.6
Upper Containment Air Lock	56
Drywell Personnel Air Lock	72.9

The ultimate capacity of the containment structure has been calculated to be 56 psig based on specified strengths. Penetration closure plates have a calculated pressure retaining capacity of 60 psig based upon initiation of yielding at the specified material strengths. Piping has been evaluated as capable of retaining 75 psig external pressure.

3. Hydrogen Igniter System (HIS) - The Nuclear Equipment Qualification Program for the hydrogen igniter assemblies is currently underway and should be completed by August, 1982. During the LOCA portion of the qualification testing, an igniter assembly will be subjected to pressures in excess of approximately 70 psig. Due to the rigid construction of each igniter assembly from 1/8" thick stainless steel, burn pressures of this magnitude should have no adverse effects on igniter operation.

4. Containment and Drywell Pressure Instruments - As indicated in Reference 1 (Specification Number 9645-J-301.0A), pressure transmitters located inside containment are qualified to pressures of approximately 87 psig.

5. Containment, Drywell, and Suppression Pool Temperature Monitors - As indicated in References 1 and 2 (Specification Number 9645-J-561.0) which includes temperature elements located in both containment and drywell, these monitors are not presently qualified but have been justified for interim operation. Qualification tests on these temperature elements are currently underway and should be completed by November, 1982. During the LOCA portion of this testing the temperature elements will be subjected to pressures of approximately 80 psig. No qualification problems are anticipated.

6. Containment High Range Radiation Monitors - As indicated in Reference 3, the containment and drywell high range radiation monitors and associated cable and connector assemblies are qualified to pressures in excess of 100 psig.

7. Drywell purge compressors, drywell vacuum breakers - As indicated in Reference 3, the drywell purge compressors were tested to a maximum pressure of 30 psia for a 20 hour period. However, the purge compressors are expected to withstand the postulated burn pressures based on the following:

   a) The postulated burn pressure spike exceeds the qualified pressure by only 9 psi and for only a 14 second time duration.

   b) Contact with the vendor has revealed that such small, short duration pressure transients will have no perceivable effects on the compressor motor, gear train, etc.

   The drywell vacuum breakers are designed to withstand a minimum pressure of 30 psig.

8. Hydrogen Recombiners - As indicated in Reference 3 (Specification Number 9645-M-190.0) the maximum pressure to which the recombiners are qualified to is 85 psia.

9. Hydrogen Analyzers - The hydrogen analyzers are located in the auxiliary building with process sample lines penetrating containment. The heat tracing cable and the RTD sensing devices provided for the sampling lines are both packed with insulation and sealed from the effects of pressure and humidity in stainless steel sheathing. The manufacturing process precludes the effects of pressure. The internal components of the analyzers are capable of withstanding pressures on the order to 70 psig. Based on this, these components are considered capable of withstanding the predicted burn pressure.

10. Safety Relief Valves (SRVs) - The SRVs which are attached to the main steam lines are located in the drywell outside the containment/wetwell burn environment. The valve housing is thick metal and is designed to operate under harsh conditions at operating system pressures. As discussed in Reference 1, tests performed on the SRV actuators demonstrated operability at a pressure of 60.7 psia for 4 days.

11. Main Steam Inboard Isolation Valves - These isolation valves are located in the drywell and are outside the wetwell/containment burn environment. The valve consists of the valve internals and housing and an air actuator with solenoids and limit switches. The valve is designed to operate in direct contact with steam at high operating pressures. The only anticipated effect of postulated burn pressures would result in the valves experiencing a slower closure time. However these valves will have performed their function within minutes after the start of an accident well before the onset of hydrogen combustion.

12. Associated Power and Control Cables - Cables used inside containment are the same type as those used in the drywell and are qualified to pressures on the order of 100 psig.

Based on the above, no adverse effects on essential equipment from postulated burn pressures of this magnitude are expected.

References

1. AECM-81/231 dated July 1, 1981, "Equipment Qualification NUREG-0588 Evaluation"

2. AECM-82/141 dated April 8, 1982, "NUREG-0588 Evaluation - Response to NRC Trip Report of January 18, 1982"

3. AECM-81/502 dated December 21, 1981, "Equipment Qualification NUREG-0588 Evaluation Supplement 2"