



# MISSISSIPPI POWER & LIGHT COMPANY

*Helping Build Mississippi*

P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

June 23, 1983

## 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  
License No. NPF-13  
File 0260/0756  
Hydrogen Igniter Performance  
AECM-83/0339

References: 1) NUREG/CR-2486, February, 1982  
2) Letter from A. Schwencer to J. P. McGaughy, Jr., dated  
November 6, 1981

In earlier submittals, Mississippi Power & Light (MP&L) provided you with information concerning the functional requirements for the Grand Gulf Hydrogen Ignition System (HIS). The information contained in the submittals reported the performance of the igniters under nominal conditions. The purpose of this letter is to clarify the capabilities of the HIS system under all circumstances.

The staff's position is that the hydrogen igniters achieve a tip temperature of 1700°F at a voltage as close to 12 volts as possible (Reference 2). We understand that 1700°F was chosen to assure a sufficient margin for hydrogen ignition during under voltage conditions and to account for the cooling effects of the containment sprays. Our commitment to the staff was to provide hydrogen igniters that are capable of 1700°F when 12 volts plus or minus 10% is applied (120 volts plus or minus 10% on the primary side of the transformer) during preshipment testing prior to commencing the qualification test program. In addition, we committed to demonstrate that each igniter would reach 1700°F by field test once installed in the plant.

Tests performed at Lawrence Livermore (Reference 1) provided a direct measurement of the glow plug surface temperature at ignition under various environmental conditions. The results of the tests under dry conditions indicate that hydrogen ignition occurred when the igniter reached 1300 to 1440°F. Under wet conditions, ignition occurred between 1390 and 1490°F. During the Grand Gulf igniter qualification program, the test results indicate that the igniter will reach 1700°F at 11.7 volts or higher and will reach 1500°F at 10.06 volts or higher.

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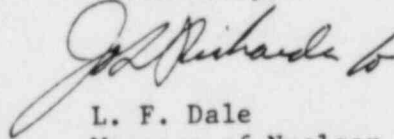
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## MISSISSIPPI POWER &amp; LIGHT COMPANY

We have evaluated the as-built HIS to determine the minimum voltage at the igniter under the worst case combination of conditions including the power grid at worst case degraded conditions, the bus loaded to its maximum, the highest environmental temperature in the containment and drywell, and the longest power cable length from the bus to the igniter. Our evaluation has determined that under the absolute worst case conditions the minimum voltage would be 10.08 volts. However, when the bus is loaded to the maximum design condition, equipment such as the ECCS which is designed to mitigate the consequences of an accident would be operational and, therefore, the HIS would not be required to perform its intended function.

In summary, the Grand Gulf HIS will perform its intended function under all degraded design conditions. If there are any questions on this information, please contact us.

Yours truly,



L. F. Dale  
Manager of Nuclear Services

GWS/SHH/JDR:sap

cc: Mr. J. B. Richard  
Mr. R. B. McGehee  
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