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

December 28, 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/L-860.0
Remote Shutdown Panel Modification,
Operating License Condition
2.C(30)
AECM-83/0802

In response to NRC Final Safety Analysis Report Question 13.18(4), Mississippi Power & Light (MP&L) committed to provide electrical isolation between the Division I control room manual safe shutdown circuits and the Division I remote shutdown panel. This position was addressed and accepted by the NRC in the Grand Gulf Nuclear Station (GGNS) Safety Evaluation Report in Section 9.5.4.1. In addition, the NRC incorporated this requirement into the GGNS Operating License as License Condition 2.C.(30). This license condition required that a description of the design modification be provided to NRC for approval by January 1, 1984.

By attachment to this letter, MP&L is submitting the subject proposed design change description in compliance with that aspect of the license condition. Full compliance to the license condition will be met by MP&L by installation of an NRC approved design modification prior to startup from the first refueling outage. You are requested to provide any comments or criticisms of this proposed modification to MP&L no later than July 1, 1984.

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

Yours truly,

L. F. Dale
Manager of Nuclear Services

JHS/JGC:rg
Attachment

cc: See next page

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cc: Mr. J. B. Richard (w/a)
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)
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30303

Background

NRC FSAR Question 013.18(4) states in part:

> "It is our position that the control room and remote shutdown panels be electrically isolated from each other so that a fire in either area that destroys redundant safe shutdown circuits in that area will not affect the safe shutdown capability from the other area."

In response to this NRC position, Grand Gulf has committed that:

> "Electrical isolation will be provided between the Division 1 control room manual safe shutdown circuits and the Division 1 remote shutdown panel."

The transfer panel will be installed solely in response to the NRC position. Grand Gulf's position on the possibility of a control room fire remains as stated in Section 7.2.2.46 of Appendix 9A to the FSAR:

> "An exposure fire in the control room which disables both divisions of redundant systems is not considered a credible event. The control room is continuously manned by trained personnel; an automatic Halon fire suppression system is provided for PGCC floor sections...; the floor covering at Grand Gulf is rated per ASTM E-84 as 20-25-110, which classifies it as a Class A material per NFPA 101, due to its very slow flame spread and very low fuel contribution; and multiple hose streams are available. Also...four Halon 1211 Type, UL Class 1A10BC portable fire extinguishers are located in the immediate vicinity of the control room."

Applicable Standards and Guides

The control circuits which are being isolated are Class 1E circuits. Consequently, the transfer panel and all inter-connecting wiring must also be Class 1E. The panel itself will be environmentally and seismically qualified in accordance with IEEE standards 323-1974 and 344-1975, respectively. All wiring will be routed strictly in accordance with Reg. Guide 1.75, Rev. 1. Fire protection measures will conform to the requirements of Appendix A to Branch Technical Position APCSB 9.5-1, dated August 23, 1976, for plants under construction before July 1, 1976.

Explanation of Design

The purpose of the transfer panel is to electrically isolate the control room from the Division I remote shutdown panel circuits. Only one division must be isolated since only one fire at a time is postulated and only one division is necessary for safe shutdown. Only the control room must be isolated since the Division I and Division II remote shutdown panels are in separate fire areas. A fire in the Division I remote shutdown room would not affect Division II circuits which could be used to maintain control from the control room. To accomplish the necessary isolation the design concept utilizes normally closed contacts which can be opened to isolate the control room circuitry from the remainder of the control circuit. A more detailed explanation of this isolation concept is given in the next few paragraphs. The simplified sketch which is attached will be useful in assimilating this explanation.

The fundamental concept of any control scheme is to turn power on or off to a load. In the sketch attached it can be seen that either the control room switch or the remote shutdown room switch can be operated to achieve the on-off function. If either of these switches is closed, current will flow

through the primary fuse in the power panel. Depending on whether the control room switch or the remote shutdown switch was activated would determine the remainder of the path. If the remote shutdown panel switch were closed, current would flow from the power panel, through the normally closed fuse isolation contact in the transfer panel, to the remote shutdown panel, through the control contacts which had been closed in that panel, back to the transfer panel, on to the load and finally return to the power panel. Similarly, under normal operating conditions, if the control room contacts were closed, current would flow through the primary fuse in the power panel and through the normally closed fuse isolation contact. From that point the path would be through the first normally closed control room switch isolation contacts, to the control room and through the control switch contacts, back to the transfer panel and through the second set of control room switch isolation contacts. From the transfer panel on, the path would be the same as previously described.

When the transfer panel is operated the current paths will change. Most notably, the control room switch isolation contacts will open, insuring that there will be no current path in the control room loop. Secondly, the fuse isolation contacts in the transfer panel will change state with the backup fuse contacts closing and the primary fuse contacts opening. These changes will result in the only current path being through the backup fuse to the remote shutdown panel loop.

Thus, no matter what damage could be postulated in the main control room, it could have no effect on the rest of the circuit once the transfer panel was operated. The isolation contacts (which are physically outside the control room) would completely isolate the control room circuits, both entering and

leaving the control room. Since the postulated fire is in the control room only, damage to switches and wiring would be confined to the control room as well. Various types of postulated fire damage with varying consequences are enumerated below:

Open circuits. If the postulated fire burned a control circuit open, the only effect external to the control room would be that there would no longer be a control room loop for that particular circuit. No currents would flow in the control room loop and the primary fuse would not be affected. Circuit control could be maintained from the remote shutdown panel. In this case isolation would only be required to avert more serious types of damage which could be postulated to be occurring in other control room circuits.

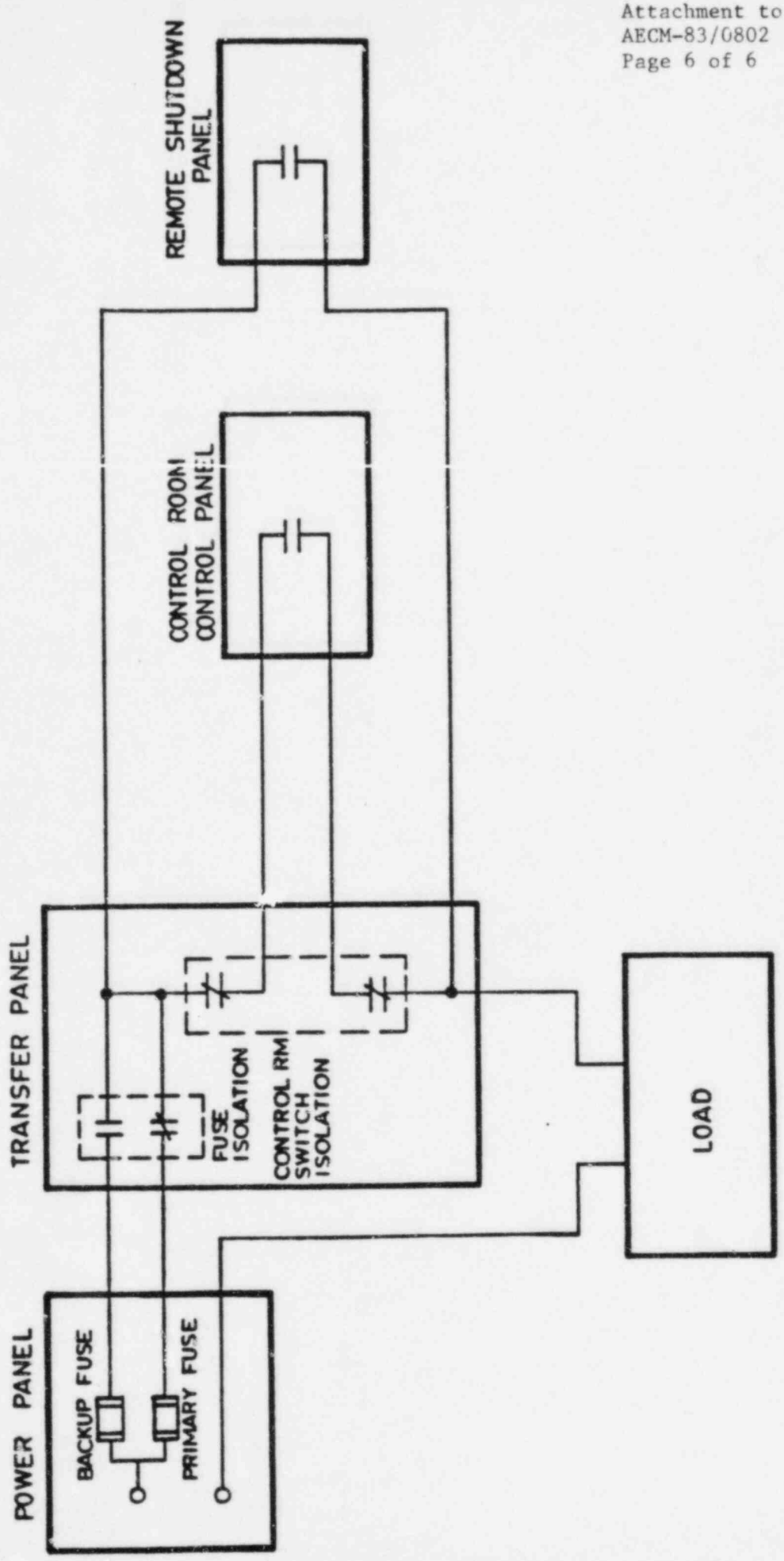
Line to line short circuits. This is the type of damage which would result if the postulated fire melted together two of the conductors in a control circuit. In effect the result would be identical to closing the control room contacts. Only normal currents would flow in the circuit and the primary fuse would be unaffected. However, isolation would be required to de-energize the load since otherwise the short would render the control circuit in the on condition until repairs could be made.

Short circuits to ground. This is the situation wherein one or more conductors become electrically connected to a ground potential. In addition to loss of control function from the control room, excessive currents would flow in the control room loops. These currents would blow the primary fuses which would act as immediate protection for the rest of the control circuitry. After the fuses blow there would be no current flow in the circuits and all wiring external to the control room would remain intact since the fuses are

sized to blow before the wiring can be damaged. Isolation would be required since the short to ground would still remain in the control room. Without opening the isolation contacts, replacement fuses would be blown as soon as installed. Because of this situation a backup fuse is inserted into the circuit at the same time that the control room loop is isolated. The primary fuse is also isolated since if it didn't blow, there would be two fuses in parallel. This situation would be in violation of the National Electric Code (NFPA 70-1981, Art. 240-8) and a violation of good engineering practice.

Design Implementation

The transfer panel will be located in the Division I switchgear room. This location was selected so that the panel is immediately accessible from the pathway between the control room and the remote shutdown room. In this way, should evacuation of the control room be ordered, the transfer panel could be operated on the way to the remote shutdown room. The panel consists primarily of approximately 35 lockout relays plus a "master" switch which electrically operates all of the relays. Thus, on his way to the remote shutdown panel, the operator merely has to stop long enough to throw one switch. This action will then remove the control function from all Division I control room circuits which are duplicated on the remote shutdown panel. However, if it was desirable to isolate only selected circuits, the lockout relays in those circuits could be manually operated individually. More importantly, control can be returned to the control room selectively as desired. Thus, the panel design gives the operator the capability of selective restoration and total or selective isolation of the control room Division 1 safe shutdown functions.


REMOTE SHUTDOWN PANEL
CONTROL ROOM CONTROL PANEL
TRANSFER PANEL
FUSE ISOLATION
CONTROL RM SWITCH ISOLATION
LOAD
POWER PANEL
BACKUP FUSE
PRIMARY FUSE