MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi

July 26, 1984

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
Unit 1
Docket No. 50-416
License No. NPF-13
File: 0260/L-860.0
Supplement to Application for
Partial, Temporary Exemption
to 10 CFR 50, Appendix A,
Criterion 17
AECM-84/0396

MP&L responded to NRC questions regarding our application for a partial, temporary exemption to General Design Criterion 17 of Appendix A to 10 CFR 50 in AECM-84/0358, dated July 19, 1984. Further conversations with your staff have resulted in a request for additional information to augment our responses to Questions 2 and 3 of our July 19, 1984 letter. This additional information is provided in our revised responses to these questions (attached).

Yours truly,

L. F. Dale,
Director

JGC/mm
Attachment

cc: Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a)
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REVISED RESPONSE TO QUESTION 2 OF AECM-84/0358

In the May 16, 1984 Shoreham Order, the Commission stated, "the applicant should include a discussion of its basis for concluding that, at the power levels for which it seeks authorization to operate, operation would be as safe under the conditions proposed by it, as operation would have been with a fully qualified onsite AC power source." MP&L interpreted "as safe as" as meaning the consequences of analyzed events meet the appropriate limits and acceptance criteria established in 10 CFR in AECM-84/0358, dated July 19,1984.

Further discussion with the NRC Staff on July 20,1984, indicated that this interpretation was incorrect and that MP&L should provide assurance that operation of Grand Gulf Unit 1 at 5% power without fully qualified TDI diesel generators is as safe as operation with fully qualified diesels.

In order to provide this assurance, MP&L has performed an evaluation of the events described in Chapter 15 of the FSAR. The results of this evaluation show that a loss of coolant accident (LOCA) has the worst consequences from a dose standpoint. A comparison of the doses from a LOCA at 5% power with the diesels available (Case 1) to a LOCA at 5% power without the diesels available (Case 2) shows that the dose from Case 2 are bounded by Case 1. Further details of this evaluation are provided in Attachment 2 to this letter.

Based on the results of this evaluation, MP&L concludes that operation of Grand Gulf Unit 1 at 5% power without fully qualified TDI diesel generators is as safe as operation with fully qualified diesels.

REVISED RESPONSE TO QUESTION 3 OF AECM-84/0358

Each event delineated in Chapter 15 the Grand Gulf FSAR was reviewed against specified acceptable fuel design limits (peak cladding temperature (PCT) and minimum critical power ratio (MCPR)) at 5% power. As a part of the process, this review was performed with offsite power assumed unavailable for those events listed in Chapter 15 which normally assume that offsite power is available. The results indicated that the consequences of the limiting transient events listed in the Grand Gulf FSAR are not adversely affected by the inclusion of this assumption, and the FSAR still bounds the transients for which MCPR limits govern.

The accident events listed in Chapter 15 are bounded by the most limiting loss of coolant accident with PCT being less than or equal to 2200°F.

An additional review of Chapter 15 events was performed to assess the dose consequences of a loss of AC power concurrent with these events. This review determined that the worst case event from a dose standpoint is a design basis LOCA. A comparison of the doses from a LOCA at 5% power without AC power for one hour (Case 2) (refer to AECM-84/0291, dated June 4,1984 for justification of one hour) to the doses from a LOCA at 5% power with AC power available throughout the event (Case 1) shows that the doses from Case 2 are bounded by Case 1. Table 1 provides a summary of the doses for these cases. Further details of the assumptions used in determining these doses is provided below.

Case 1 is an evaluation of a LOCA using the assumptions and conditions described in FSAR section 15.6.5, with the following exceptions:

1. The power level at the time of the accident is 5% of rated power.

2. The control room X/Qs used in dispersing the activity released are as described in AECM-84/0061, dated February 6,1984.

3. The control room inleakage rate is 590 cfm as described in AECM-84/0061.

Case 2 is an evaluation of the same accident with the additional assumption that AC power is unavailable for one hour. The loss of AC power for this time period modifies the analysis in the following ways:

1. The Standby Gas Treatment System (SGTS) does not operate for the first hour. During this time leakage from the containment is assumed to mix throughout all of the auxiliary building volume. The leak rate out of the auxiliary building equals the leak rate into it from the containment, after correcting for pressure differences between the buildings. Case 1 assumes that the SGTS is operational two minutes into the accident.

2. The containment sprays do not operate for the first hour. Case 1 assumes that they actuate 30 minutes into the accident.

3. The MSIV leakage control system does not operate for the first hour. Case 1 assumes that the leakage control system is operational 20 minutes into the accident.

Both cases assume that the accident does not result in core damage. This assumption of no fuel damage was justified in AECM-84/0291, dated June 4, 1984, and was based on an analysis by GE that showed that 10 CFR 50.46 criteria are met if the core is reflooded within 69 minutes. However, for conservatism, and to be consistent with the guidance of Regulatory Guide 1.3, it was assumed that 100% of the available inventory of noble gases and 25% of the available inventory of iodines are released from the containment. This source term inventory was determined based on a 5% power level and is, therefore, much smaller than the inventory used in the FSAR analysis of this event. Correspondingly, a comparison of the doses shown in Table 1 to those in FSAR Table 15.6.14 shows that the doses from a LOCA at 5% power are also considerably lower. Use of a more realistic source term would lower these doses by as much as three orders of magnitude.

As stated above, of the events described in Chapter 15 of the FSAR, a LOCA results in the highest doses. This determination was made by comparing the consequences of this event to the consequences of the other events in Chapter 15. These consequences are the result of the activity released during the event. A grouping of the events in Chapter 15 can be obtained by comparing the cause of the release. A summary of the causes of the releases and the events that fit into them is provided below.

The vast majority of the events result in very small doses because their only source of activity is from reactor coolant that may be released to the suppression pool during the pressure transient that could result from a loss of AC power. There are 24 events in this category; 15.1.1, 15.1.2, 15.1.3, 15.1.4 (15.6.1), 15.1.6, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5, 15.2.6, 15.2.7, 15.2.9, 15.2.10, 15.3.1, 15.3.2, 15.3.3, 15.3.4, 15.4.2, 15.4.3, 15.4.4, 15.4.5, 15.4.7, and 15.5.1 (15.5.3).

Several of the events result in doses that are composed of two factors; 1) activity released as a result of the event itself and 2) the activity released as a result of the release of reactor coolant to the suppression through the safety/relief valves as a result of the loss of AC power. The addition of the activity from the coolant to the activity from the event itself, however, results in essentially the same doses. This is due to the fact that the reactor coolant activity level is very small compared to that assumed to be released during the event. There are six events in this category; 15.4.8, 15.6.4, 15.6.6 (15.2.8), 15.7.1, 15.7.2, and 15.7.3.

Four of the events are postulated to occur during refueling. The events in this category are: 15.4.1, 15.7.4, 15.7.5, and 15.7.6. Of these events, 15.7.4, "Fuel Handling Accident in Auxiliary Building," has the highest dose consequences. If AC power is lost following a fuel handling event, the doses are lower because holdup in the auxiliary building offsets the dose reduction provided by the SGTS. These results are consistent with those described above for a LOCA.

The remaining events in Chapter 15 are not applicable to Grand Gulf. There are five events in this category; 15.1.5, 15.4.6, 15.5.2, 15.6.2, and 15.6.3.

Table 1

Post-LOCA Doses (Rem)

	Case 1	Case 2
Control Room (0 - 30 day)		
Thyroid	1.193	0.506
Beta Skin	0.481	0.470
Whole Body	0.031	0.030
Site Boundary (0 - 2 hour)		
Thyroid	5.178	1.117
Whole Body	0.622	0.465
Low Population Zone (0 - 30 day)		
Thyroid	3.702	2.546
Whole Body	0.792	0.756