MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
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June 4, 1984

J. B. RICHARD
SENIOR VICE PRESIDENT - NUCLEAR

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
Application for Partial, Temporary
Exemption to 10CFR Part 50,
Appendix A, Criterion 17
AECM-84/0291

INTRODUCTION

Over the past several months, Mississippi Power & Light Company (MP&L) has made several submittals and met with your staff and its consultants on the specific subject of the reliability of the Transamerica Delaval, Inc. (TDI) diesel generators at Grand Gulf Nuclear Station (GGNS) Unit 1 and the broader subject of the overall reliability of the GGNS Unit 1 Onsite/Offsite Power Supply Systems.

MP&L made its most recent submittal on May 6, 1984 (augmented by a submittal on May 14, 1984), in which two alternative proposals were made for operation of GGNS Unit 1 at power levels up to 100% rated power, pending the ultimate resolution of questions regarding the reliability of the TDI diesel generators.

Based upon its review of this information, and upon consultation with its consultants, the NRC staff concluded that additional information is needed regarding the present condition of critical TDI diesel generator components in order to support interim operation of GGNS Unit 1 at power levels in excess of 5% power. Accordingly, on May 22, 1984, the NRC issued an Order to MP&L which requires that the Division I TDI diesel generator at GGNS Unit 1 be disassembled, inspected, repaired (as necessary), reassembled, and tested prior to proceeding above 5% power.

The Order also indicated that, while the questions regarding the reliability of the GGNS Unit 1 TDI diesel generators are being resolved, there is a need to enhance the availability of other sources of power supplied to the facility. In this regard, the Order requires that MP&L provide additional power supplies and compensating actions which are reflected in the revised interim technical specifications appended to the Order. The Order specifically stated that:

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> The licensee shall not operate the Grand Gulf facility under the terms of License No. NPF-13 unless such operation is in conformance with the revised interim technical specifications appended to this Order.

In its Safety Evaluation Report (SER) related to this Order, the NRC staff concluded that the total failure of the two GGNS Unit 1 TDI diesel generators would not significantly increase the risk of low power operation and that the risk is acceptably small. Although the staff analysis upon which this conclusion is based does not include credit for the compensating effects of the Gas Turbine Generator (GTG) system recently installed at GGNS Unit 1, the SER acknowledges the fact that the GTG system has been provided as a substitute for an out-of-service TDI diesel generator during the period of inspection and subsequent preoperational testing. It is also noteworthy that the above-mentioned staff analysis does not include credit for the operability of the Division II TDI diesel generator, even though the revised interim Technical Specifications require that the Division II TDI diesel generator be maintained in an operable status for operation at power levels up to 5% with the Division I TDI diesel generator out of service for inspection.

The additional defense in depth provided by the GTG system and the remaining operable TDI diesel generator is recognized by the NRC staff as indicated in the Overall Conclusion of its SER which states that:

> Based upon our evaluation of the available power sources and in view of the minimum power needs for low power operation, the staff finds that these sources (offsite, one TDI diesel and gas turbine generators) together with the specified surveillance requirements, represent a power system which has the capacity, capability, reliability, and redundancy for this low power level and that the health and safety of the public will not be endangered by implementation of this Order.

PURPOSE

The Commission has recently interpreted General Design Criteria (GDC) 17 of 10CFR Part 50, Appendix A, in the Shoreham proceeding as requiring redundant, qualified onsite power sources for low power operation in the absence of an approved exemption from such a requirement.

The NRC's Order of May 22, 1984 to MP&L requires that one of the two GGNS Unit 1 TDI diesel generators be taken out of service for inspection. Implicit in that Order and its associated revised interim technical specification

requirements (which have their foundation in GDC-17)* is a partial, temporary exemption from the express requirements of GDC-17. As a result of this Order and in light of the Commission's recent Shoreham decision, the NRC staff has requested MP&L to file an exemption request. Granting the request would have the effect of making explicit the implicit exemption contained in the May 22, 1984 Order.

Accordingly, pursuant to 10CFR 50.12(a), MP&L hereby requests a partial, temporary exemption from the requirements of GDC-17 and any other applicable regulations that apply to redundant, qualified onsite emergency power systems. Such an exemption would be partial in that it would only apply to the requirements of GDC-17 which apply to onsite power supplies. Such an exemption would be temporary in that it would only be necessary until such time as the NRC and MP&L reach agreement on the qualification and reliability of the TDI diesel generators at GGNS Unit 1.

The principal focus of this exemption request is GDC-17. Based on its review of the regulations, MP&L believes that a lack of literal compliance with GDC-17 may indirectly result in a lack of literal compliance with several other GDC (e.g., GDC-33, GDC-34, GDC-35, GDC-38, GDC-41, and GDC-44). However, MP&L believes that such potential indirect non-compliances would be remedied by granting the requested exemption to GDC-17. Nonetheless, to the extent that the Commission or NRC staff conclude that residual aspects of this request call into effect other regulations, this application is deemed to expressly request an exemption from such regulations. In addition, to the extent that the compensating sources of onsite power are deemed to be out of conformance with the regulations and such compensating factors are deemed to be mandatory, this application should be considered to explicitly seek exemption from such regulations. MP&L believes that the safety justifications set forth herein and in the SER accompanying the May 22, 1984 Order are equally applicable to any such additional exemptions, as are the public interest considerations presented herein.

*The operability and surveillance requirements for AC power supply systems set forth in the GGNS Unit 1 technical specifications which were in effect prior to the May 22, 1984 Order were constructed to ensure that conformance with the requirements of GDC-17 would be maintained during plant operation at power levels up to 100%. The operability and surveillance requirements for AC power supply systems set forth in the revised interim technical specifications for GGNS Unit 1 were similarly constructed to ensure that conformance with the intent of the requirements of GDC-17 would be maintained during plant operations at power levels up to at least 5% with one TDI diesel generator out of service for inspection. The revised interim technical specifications, which are essentially identical to those described in MP&L's May 6, 1984 submittal to the NRC staff, (1) retain the operability and surveillance requirements for the remaining TDI diesel generator and the HPCS diesel generator, (2) establish new operability and surveillance requirements for the GTG system which meet or exceed those required for the diesel generators, (3) establish additional restrictive operability and surveillance requirements for onsite power supplies to compensate for the fact that the GTG system does not currently fully meet all of the design criteria which are applicable to typical, fully qualified onsite emergency power supplies, and (4) provide more restrictive operability requirements for the offsite power supply system.

At the present time*, this exemption request is limited to the extent that it is intended to support continued operation of GGNS Unit 1 at power levels up to 5% of full power.

Information in support of this exemption request is provided below and in the attachments to this letter.

JUSTIFICATION FOR THE REQUESTED EXEMPTION

The regulations provide for specific exemptions in 10CFR 50.12(a). The Commission has provided additional guidance regarding this regulation in its recent Order in the Shoreham proceeding.**

In view of the standards in 10CFR 50.12(a) and the Commission's guidance regarding interpretation of the regulation as it applies to exemptions from GDC 17, we may synthesize the circumstances in which the requested exemption is warranted as follows: (1) the activities to be conducted are authorized by law; (2) low power operation does not endanger life or property because such operation under the exemption would be "as safe as" operation at 100% power in literal compliance with GDC 17; (3) the common defense and security are not endangered; and (4) the exemption from GDC 17 is in the public interest because of exigent circumstances.

As demonstrated by the discussion herein, and supported by the attachments to this correspondence and previous submittals to the Commission incorporated herein by reference, MP&L is entitled to a partial, temporary exemption from GDC 17 because near term safety is adequately protected, assurance of long term safety will be enhanced, and exigent circumstances exist.

I. The Requested Exemption and the Activities Which Would Be Allowed Under It Are Authorized by Law

MP&L is currently operating GGNS Unit 1 at low power (less than 5% of full power) pursuant to License No. NPF-13, which was issued in accordance with the Atomic Energy Act as amended. The activities conducted at GGNS Unit 1 at power levels less than 5% of full power are of the type normally conducted during the start-up of all nuclear power plants.

One requirement of the license for GGNS Unit 1 (as well as for all licensed nuclear power facilities) is that the licensee is bound by Commission Orders modifying the license, such as the May 22, 1984 Order which required disassembly, inspection, and testing of one TDI diesel generator and which established revised interim Technical Specification

*MP&L may at a later date, if necessary, request a similar exemption to support operation of GGNS Unit 1 at power levels in excess of 5% of full power.

**Order, Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), CLI-84-8, May 16, 1984.

requirements governing continued operation of GGNS Unit 1 at less than 5% of full power. The requested exemption is intended to accomplish explicitly what that Order established implicitly.

If the criteria established in 10CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition by law exists to preclude the activities which would be authorized by the requested exemptions, as is the case, then the Commission is authorized by law to grant this exemption request.

II. The Requested Exemption Will Not Endanger Life or Property

In its previous submittals dated May 6, 1984 and May 14, 1984, MP&L has demonstrated that operation of GGNS Unit 1 at power levels approaching 100% power would not endanger the public health and safety, provided that reasonable credit be allowed for the reliability of one TDI diesel generator and the GTG system at GGNS Unit 1

As indicated in the Introduction section of this letter, in support of its May 22, 1984, Order, the NRC staff has performed a more conservative analysis which demonstrates that, with no credit given for the TDI diesel generators or the GTG system, the risk to the public health and safety of operation of GGNS Unit 1 at power levels up to 5% of full power is acceptably small. This conservative NRC staff analysis also demonstrates that the risk to the public of operation of GGNS Unit 1 at power levels up to 5% of full power is several orders of magnitude less than the very low risk of operation at 100% power with fully qualified onsite power supplies.

The May 22, 1984 Order established revised interim Technical Specification requirements for GGNS Unit 1. These technical specifications require, among other things, that both the remaining TDI diesel generator and the GTG system be maintained in an operable condition for low power operations. Consequently, the actual risk to the public health and safety is even lower than that which the staff has already determined to be acceptable under conservative assumptions.

Based upon the analyses previously submitted by MP&L to the NRC staff and upon MP&L's review of the conservative analysis performed by the NRC staff in support of the May 22, 1984 Order, MP&L has concluded that sufficient information currently exists in the public record to demonstrate that the requested exemption will not endanger life or property. Nonetheless, at this time, MP&L is providing additional information in Attachments 1 and 2 to support this exemption request.

Attachment 1 addresses the reliability of the offsite/onsite power supply systems at GGNS Unit 1.

Attachment 2 provides the results of a review of the impact on the GGNS Unit 1 FSAR Chapter 15 analyses of operation at power levels up to 5% with both TDI diesel generators assumed to be unavailable.

III. The Requested Exemption Will Not Endanger the Common Defense and Security

The common defense and security are not implicated in this exemption request. Only health and safety matters are of concern.

IV. The Requested Exemption Is In the Public Interest

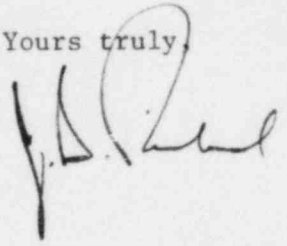
In its recent Order in the Shoreham proceeding* the Commission set forth guidelines for determining whether "exigent" (or "exceptional", the terms being used interchangeably) circumstances exist and, accordingly, whether the public interest would be served in granting an exemption to GDC-17 should it be demonstrated that, in spite of noncompliance with a literal reading of GDC-17, the health and safety of the public would be protected.

Utilizing these guidelines, as they apply to GGNS Unit 1, MP&L has concluded that they clearly weigh in favor of a finding that the requested exemption is "otherwise in the public interest." A summary of MP&L's assessment of the equities of this situation is provided as Attachment 3. The safety significance of the issues involved have already been addressed elsewhere in this correspondence and are not repeated in Attachment 3.

CONCLUSION

Based on the information presented and referenced in this correspondence, MP&L has demonstrated that its request for a partial, temporary exemption from the requirements of GDC-17 (and any other applicable regulations that apply to redundant, qualified onsite emergency power systems) for GGNS Unit 1 satisfies the criteria set forth in 10CFR 50.12(a) and the Commission's recent interpretation of 10CFR 50.12(a) in the Shoreham proceeding and is, therefore, justified.

Yours truly,



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Attachments

cc: (See Next Page)

*Order, Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), CLI-84-8, May 16, 1984

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File (Plant) (w/a)
File (Project) (w/a) [ ]

AFFIDAVIT

STATE OF MISSISSIPPI
COUNTY OF HINDS

J. B. Richard, being duly sworn, states that he is Senior Vice President - Nuclear, of Mississippi Power & Light Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this exemption request on behalf of said Company, Middle South Energy, Inc. and South Mississippi Electric Power Association; that he signed the foregoing exemption request as Senior Vice President - Nuclear, of Mississippi Power & Light Company; and that the statements made and the matters set forth therein are true and correct to the best of his knowledge, information and belief.

J. B. Richard

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 4th day of June, 1984.

(SEAL)

Paul J Richardson
Notary Public

My commission expires:

[redacted] Engineer Oct. 27, 1987

RELIABILITY OF GGNS UNIT 1
OFFSITE/ONSITE AC POWER SUPPLIES

In previous submittals to the NRC staff, MP&L has described, in detail, the configuration of the offsite power supply system for GGNS Unit 1 and the GTG system which was recently installed as an additional source of onsite emergency power supply for GGNS Unit 1. The May 6, 1984 submittal by MP&L summarizes the key features of these power supply systems and describes their high level of reliability. The information contained in that submittal is hereby incorporated by reference.

The offsite power supply system clearly exceeds the requirements of GDC-17. The GTG system does not fully meet all of the design criteria applicable to typical onsite emergency power supply systems (i.e., those criteria applied to onsite emergency diesel generators); however, the GTG system does, in large measure, approach satisfaction of those criteria and does provide a significant degree of direct compensation for the temporary unavailability of one of the TDI diesel generators.

The revised interim technical specification requirements established by the May 22, 1984 Order (1) retain the operability and surveillance requirements for the remaining two diesel generators, (2) establish new operability and surveillance requirements for the GTG system which are equivalent to those for the diesel generators, (3) establish additional restrictive operability requirements for onsite power supplies to compensate for the fact that the GTG system does not fully meet certain design criteria which are applicable to typical onsite emergency power supplies, and (4) provide more restrictive operability requirements for the offsite power supply system.

The integrated effect of the interim revised technical specifications is to ensure a highly reliable AC power supply system at GGNS Unit 1.

In fact, based on the information presented in MP&L's submittal dated May 14, 1984 (which is hereby incorporated by reference), the reliability of the GGNS Unit 1 AC power supply system (even with one TDI diesel generator out of service and with the other TDI diesel generator assumed to be in a degraded condition) is such that there is a reasonable level of assurance that the risk to the public health and safety of operation of GGNS Unit 1 at power levels up to 100% power in accordance with the operability requirements of the interim Technical Specifications is essentially equivalent to the risk of operation at 100% power with both TDI diesel generators fully qualified but without the additional features (e.g., the GTG system) required by the interim revised Technical Specifications.

Clearly then, if operation of GGNS Unit 1 in its current configuration and in accordance with the interim revised Technical Specifications is limited to 5% of full power (as would be the case under the requested exemption), the risk to the public health and safety is significantly less than the risk associated with 100% power operation with both TDI diesel generators fully qualified but without the additional features required by the interim revised Technical Specifications (as would be the case if an exemption were not necessary).

FSAR CHAPTER 15 EVALUATION AT 5% POWER WITH BOTH GRAND GULF TDI DIESEL GENERATORS UNAVAILABLE

Introduction

To confirm that operation of GGNS Unit 1 at 5% power will not endanger the public health and safety, MP&L, in conjunction with General Electric Company and Bechtel Power Corporation, has reviewed the spectrum of accidents and transients considered in Chapter 15 of the GGNS FSAR using the conservative assumption that both of the TDI diesel generators are inoperable.

This review was based upon the same criteria and bases as the original Chapter 15 analyses for GGNS which have been previously reviewed and approved by the NRC. However, where an assumption of a loss or unavailability of offsite power is required in the original analysis, the additional postulated unavailability of the two TDI diesel generators was also considered.

Summary

Chapter 15 of the GGNS FSAR provides the results of analyses for the spectrum of accident and transient events that must be accomodated by the plant to demonstrate compliance with the NRC's regulations and to ensure protection of the public health and safety. A review of the forty-four Chapter 15 events was performed for GGNS Unit 1 at 5% power postulating the unavailability of the two TDI diesel generators.

Based upon the results of this review, MP&L has concluded that operation of GGNS Unit 1 at 5% power with both TDI diesel generators unavailable does not constitute an undue risk to the public health and safety. In fact, the risk under these conditions is significantly less than the risk that has already been found to be acceptable by the NRC for 100% power operation of GGNS Unit 1. The basis for this statement is attributable to three factors: (1) operation at low power results in a small inventory of fission products in the core compared to full power operation. This low fission product inventory substantially reduces the amount of decay heat present in the core following shutdown and substantially reduces the radioactivity in the core that could be released upon any postulated fuel failure; (2) accidents or transients initiating at low power are generally milder and progress more slowly, which gives the operator increased time to take appropriate manual actions which further minimize the severity of the events and reduce the likelihood of any need for automatic operation of the plant's safety systems; and (3) the capacity requirements for mitigating systems (such as cooling and ventilation systems) are substantially reduced because of the low power levels. This reduces the amount of plant equipment needed to mitigate events (i.e., fewer pumps or smaller pumps) and, as a result, reduces AC power requirements.

Discussion of Results

(1) The review of the 44 Chapter 15 events as delineated in Exhibit 1 for low power operations revealed that three of the events in Chapter 15, generator load rejection (FSAR 15.2.2), failure of small lines carrying primary coolant outside containment (FSAR 15.6.2), and spent fuel cask drop

accidents (FSAR 15.7.5) cannot occur. Generator load rejection cannot occur because the generator will not be connected to the grid during 5% power operation. Failure of small lines carrying primary coolant outside containment cannot occur because Grand Gulf has no such line penetrating the containment boundary. The third event, the cask drop, is precluded by the single failure proof lifting device design.

Also, four events in Chapter 15 are not applicable to BWRs, i.e., the spectrum of steam system piping failures inside and outside of containment in a PWR (FSAR 15.1.5), chemical and volume control system malfunction (FSAR 15.4.6), chemical and volume control system malfunction or operator error (FSAR 15.5.2), and steam generator tube failure (FSAR 15.6.3).

(2) Of the remaining 37 events that can occur during this phase of operation, 31 of the events do not assume the loss or unavailability of offsite AC power. For each of these 31 events, operation of the plant up to 5% of rated power will be bounded by the Chapter 15 analysis. Since the Chapter 15 analysis considers all possible phases of plant operation, it follows that operation at 5% results in consequences less severe than those analyzed in Chapter 15. An example is the loss of feedwater heating event (FSAR 15.1.1). This event assumes continuous operation without feedwater heating, resulting in the injection of colder feedwater. For operation at power levels less than 5%, the impact of lost feedwater heating is minimal because of the low feedwater flow. Since these analyses are not required to assume the absence of AC power, potential unavailability of the TDI diesels has no effect on the assessment of these events.

Not only are the results of these 31 events bounded by the Chapter 15 analysis, the consequences of these events are also less than the consequences stated in the FSAR. First, the fission product inventory in the core will not exceed 5% of the values assumed in the FSAR. This low fission product inventory reduces risk in two ways: (a) the amount of decay heat present in the core following shutdown is substantially reduced, and (b) the amount of radioactivity that could be released if fuel failures were postulated is substantially reduced.

The second factor contributing to the significantly lower risk during low power operation is the increased time available for preventive or mitigating action should such action be deemed desirable by the operator. Longer time is available because the limited power levels means that it takes longer for the plant to reach setpoints and limits. For example, on loss of feedwater flow (FSAR 15.2.7), the water level in the reactor will decrease at a slower rate than if the event occurred at 100% power. This gives the operator more time to act manually to restore feedwater before an automatic action takes place. Similarly, in the loss of condenser vacuum event (FSAR 15.2.5), the operator will have more time to identify the decreasing volume and to take steps to remedy the situation before automatic actions such as feedpump trip or main steam isolation occur. Another example is the main steam isolation valve closure event (FSAR 15.2.4). At 5% power, the amount of heat produced upon isolation of the reactor vessel (which is followed by a reactor scram) results in a much slower pressure and temperature increase than would be experienced at 100% power. This gives the operator more time to manually initiate reactor cooling rather than relying on automatic action. In effect, the operator may end the transient before there is any substantial impact on the plant.

The third factor contributing to the significantly lower risk during low power operation is the reduction in the required capacity for mitigating systems. Because of the lower levels of decay heat present following operation at 5% power, the demand for core cooling and auxiliary systems is substantially reduced, permitting the operation of fewer systems and components of smaller system capacity to mitigate any event. It follows that the AC power requirements for mitigation are substantially reduced for 5% power operation as compared to 100% power operation.

(3) As already noted, only 6 of the events analyzed in Chapter 15 require the assumption of the unavailability of offsite AC power for operation. Of these six events, the loss of coolant accident is the most limiting event.

The Chapter 15 LOCA analysis assumes the unavailability of offsite AC power. This is a conservative licensing assumption due to the fact that there are multiple sources of AC power available to the Grand Gulf site (e.g., the HPCS diesel generator, one TDI emergency diesel generator, normal sources of offsite power and emergency gas turbines on the Grand Gulf site). Additional discussion regarding the reliability of the multiple Grand Gulf AC power supplies is provided in Attachment 1 of this submittal. Thus, it is highly unlikely that AC power will be unavailable at Grand Gulf to mitigate a loss of coolant accident during power operations at 5% rated power. As discussed below, in the unlikely event offsite AC power is lost, it can be restored within sufficient time to prevent exceeding the limits of 10CFR 50.46 and Appendix K.

As shown in Exhibit 2, GE has determined that for 5% power as long as reflooding of the core has occurred within 69 minutes, 10CFR 50.46 criteria will be met. Using more realistic assumptions (i.e., ANSI 5.1, 1979 and a film coefficient of h = 0.05 Btu/hr/ft^2/°F), the time available before 10CFR 50.46 limits are reached is 126 minutes. Traces of PCT versus time for these analyses are provided as Exhibits 3 and 4. Grand Gulf's capability to reflood the core within 69 minutes following a LOCA depends upon the ability to restore any offsite power circuit, one TDI diesel generator, or the gas turbines. The Commission's Order to MP&L of May 22, 1984 requires that the subject power supplies be demonstrated operable at least every 31 days. In addition, the order requires that the gas turbines be demonstrated operable every 15 days by starting and attaining rated speed and voltage within 25 minutes. These frequent operability demonstrations provide added assurance that AC power is available when required to mitigate the consequences of an accident. Even if AC power was not restored and these limits were reached, there would be no release of fission products due to the significant margin between the 10CFR 50.46 temperature limit and the temperature at which cladding perforation would occur. It should be noted that this analysis assumes that the onsite diesel generator (non-TDI) dedicated to the HPCS system is also unavailable. If HPCS is assumed available, then the peak clad temperature reaches 635°F maximum under the worst postulated break using Appendix K models. This temperature is far below the PCT limit of 2200°F. Therefore, given the availability of HPCS, core integrity is not jeopardized even after sustaining the worst-case recirculation line break.

(4) For the other five events, (1) loss of AC power (FSAR 15.2.6), (2) pipe break outside containment (PBOC) (steam line break accident) (FSAR 15.6.4),

(3) feedwater system line break (FSAR 15.2.3), (4) feedwater line break outside containment (FSAR 15.6.6) and (5) failure of RHR Shutdown Cooling (FSAR 15.2.9), the reactor would automatically isolate. An evaluation has been performed to assure the adequacy of containment isolation in the event AC power sources cannot provide immediate isolation. Based upon the results of this evaluation, we have concluded that, through the use of appropriate manual action, containment isolation can be accomplished in a timely manner.

For all five events, RCIC would be available to provide reactor coolant makeup. Even if RCIC ceases to function after a few hours, the reactor core will be covered by coolant water for at least four days due to the small decay heat at 5% power and to significant heat losses from the reactor vessel to the drywell. Given the heat capacity of passive heat sinks such as structural steel, suppression pool cooling would not be required for more than 25 days. Therefore, there is ample time for AC power to be restored. Furthermore, the assumption of the loss of offsite power in the context of pipe breaks outside containment (main steam line break accident and feedwater system break accident) is a conservatism which stems from the PBOC analysis methodology. That methodology requires the assumption of a loss of offsite power for pipe breaks which result directly in a plant trip of the turbine generator system or reactor protection system. Notwithstanding grid stability analyses, it is assumed that plant trips could cause perturbations of the grid, resulting in the loss of offsite power. For operation at 5% power or less, however, the turbine generator is not connected to the grid, and therefore any assumption of induced perturbation to the offsite grid is not applicable.

(5) In summary, even if the Grand Gulf TDI diesels are assumed to be unavailable, there is ample assurance that fuel design limits and design conditions of the reactor coolant pressure boundary will not be exceeded as a result of anticipated operational occurrences, and that the core will be cooled and containment integrity and other vital functions will be maintained in the event of postulated accidents.

EXHIBIT 1

EVALUATION OF GRAND GULF FSAR CHAPTER 15
EVENTS AT 5% POWER

	Chapter 15 Events	Event Category	Assumes Unavailability of Offsite AC
1.	Loss of Feedwater Heating	**	No
2.	Feedwater Controller Failure Maximum Demand	**	No
3.	Pressure Regulator Failure - Open	**	No
4.	Inadvertent Safety/Relief Valve Opening	**	No
5.	Spectrum of Steam System Piping Failures Inside and Outside of Containment in a PWR	NA	NA
6.	Inadvertent RHR Shutdown Cooling Operation	**	No
7.	Pressure Regulator Failure - Closed	**	No
8.	Generator Load Rejection	*	NA
9.	Turbine Trip	**	No
10.	MSIV Closures	**	No
11.	Loss of Condenser Vacuum	**	No
12.	Loss of AC Power	**	Yes
13.	Loss of Feedwater Flow	**	No
14.	Feedwater Line Break	**	Yes
15.	Failure of RHR Shutdown Cooling	**	Yes
16.	Loss of Instrument Air System	**	No
17.	Recirculation Pump Trip	**	No
18.	Recirculation Flow Control - Decreasing Flow	**	No
19.	Recirculation Pump Seizure	**	No
20.	Recirculation Pump Shaft Break	**	No
21.	Rod Withdrawal Error - Low Power	**	No
22.	Rod Withdrawal Error at Power	**	No
23.	Control Rod Maloperation (System Malfunction or Operator Error)	**	No
24.	Abnormal Startup of Idle Recirculation Pump	**	No
25.	Recirculation Flow Control with Increasing Flow	**	No
26.	Chemical and Volume Control System Malfunction	NA	NA
27.	Misplaced Bundles Accident	**	No
28.	Control Rod Drop Accident (CRDA)	**	No
29.	Inadvertent HPCS Startup	**	No
30.	Chemical and Volume Control System Malfunction (or Operator Error)	NA	NA
31.	BWR Transients Which Increase Reactor Coolant Inventory	**	No

*Event cannot occur.
**Bounded by same event at higher power level per FSAR Chapter 15.

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	Chapter 15 Events	Event Category	Assumes Unavailability of Offsite AC
32.	Inadvertent Safety/Relief Valve Opening	**	No
33.	Failure of Small Lines Carrying Primary Coolant Outside Containment	*	NA
34.	Steam Generator Tube Failure	NA	NA
35.	Steam System Piping Break Outside Containment	**	Yes
36.	Loss-of-Coolant Accidents (Resulting from Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary - Inside Containment)	**	Yes
37.	Feedwater Line Break - Outside Containment	**	Yes
38.	Offgas System Leak or Failure	**	No
39.	Radioactive Liquid Waste System Leak or Failure (Release to the Atmosphere)	**	No
40.	Postulated Radioactive Releases Due to Liquid Radwaste Tank Failure	**	No
41.	Fuel Handling Accident (in the Auxiliary Building	**	No
42.	Spent Fuel Cask Drop Accidents	*	NA
43.	Fuel Handling Accident Inside Containment	**	No
44.	Capability of Present BWR 4/5/6 Design to Accommodate ATWS	**	No

*Event cannot occur.
**Bounded by same event at higher power level per FSAR Chapter 15.

EXHIBIT 2

ECCS LOCA EVALUATION

- Core Average Power — 5.0% rated
- Peak Rod LHGR — 1.1 kw/ft
- Time to 10CFR 50.46 Limits

Appendix K		69 Minutes
Realistic	h = 0.05*	126 Minutes

- 10CFR 50.46 Limits

	PCT (°F) (Limit 2200°F)	Local Oxidation (Limit 17%)	Core Wide Oxidation (Limit 1%)
Appendix K	2200	7.1	0.85
Realistic (h = 0.05)*	2200	9.3	0.9

*Units on film coefficient: BTU/hr/ft^2/°F.

JESQdb7

EXHIBIT 3

PEAK CLADDING TEMPERATURE VERSUS TIME AFTER BREAK

GRAND GULF

DESIGN BASIS ACCIDENT, RECIRCULATION SUCTION BREAK, NO SYSTEMS AVAILABLE

(5% POWER WITH APPENDIX K ASSUMPTIONS)

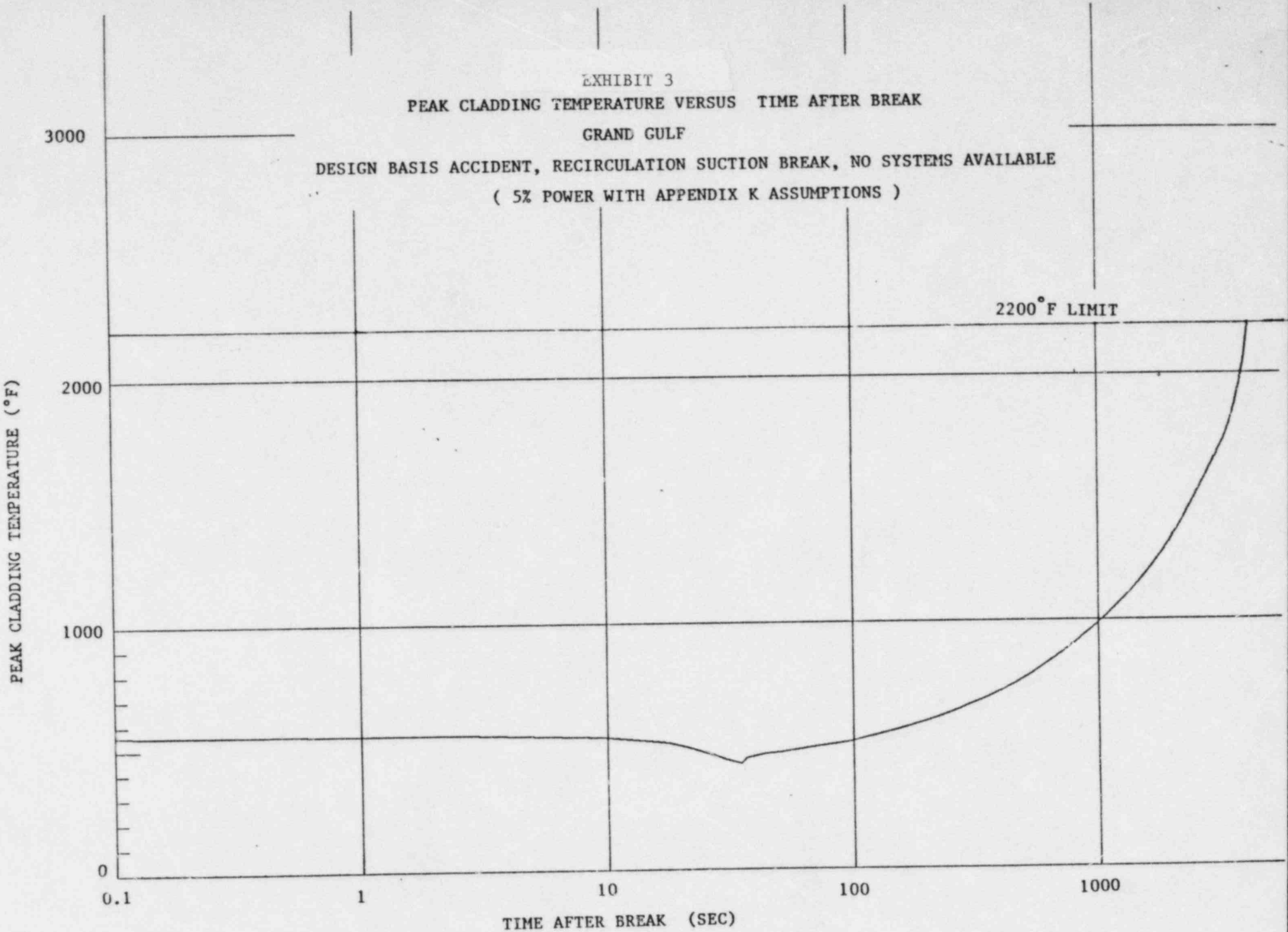


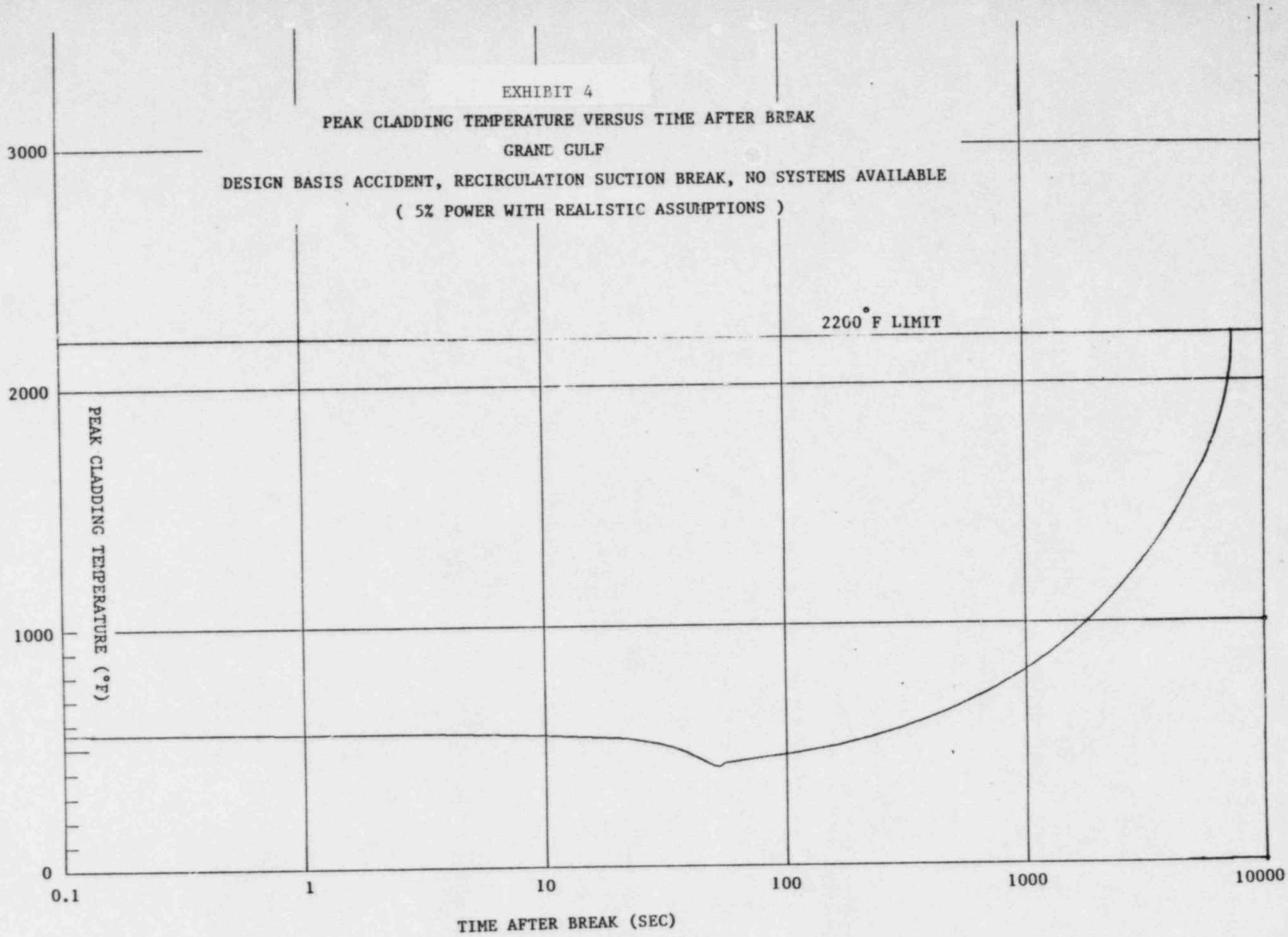
EXHIBIT 4

PEAK CLADDING TEMPERATURE VERSUS TIME AFTER BREAK

GRAND GULF

DESIGN BASIS ACCIDENT, RECIRCULATION SUCTION BREAK, NO SYSTEMS AVAILABLE

(5% POWER WITH REALISTIC ASSUMPTIONS)



INFORMATION SUPPORTING THE FACT THAT THE REQUESTED EXEMPTION IS IN THE PUBLIC INTEREST

1. The Stage of the Facility's Life

Grand Gulf Unit 1 is physically complete in all essential details and, were it not for the requirement to inspect one TDI diesel generator, would be ready shortly for power ascension to full power operation*. For the reasons stated herein, continued operation at or near 5% of full power is necessary to prevent possible delays in ascension to full power once the diesel generator has been disassembled, inspected, reassembled and tested.

The current schedule calls for the TDI disassembly, inspection, and post-reassembly testing efforts to be completed within six to eight weeks from May 24, 1984, the date the inspection work began. At that point, MP&L would be ready to receive a full power license from the Commission. Upon receiving the license, Grand Gulf will begin power ascension. Unless continued low power operation is permitted, the anticipated commercial operation date of the Unit could be delayed.

2. Financial or Economic Hardship*

The critical components demanding continued low power operation of the Unit are the in-core startup neutron sources installed in the reactor core. The seven (7) in-core startup neutron sources installed in the reactor core are Antimony-Beryllium, and have a half-life of 60.2 days. The startup sources have been installed in the core since February 1983. At the NRC's request, GGNS Unit 1 was voluntarily maintained in a shutdown status by MP&L from November 1983 through April 22, 1984, during which period regulatory concerns regarding the documentation of licensed operator qualification and the Unit's Technical Specifications were resolved.

Upon entering the licensed operator recertification program in November 1983, MP&L recognized that the startup source strength would not be sufficient to allow startup in accordance with the Unit's Technical Specifications at the conclusion of that program. Therefore, upon application by MP&L, the NRC on February 21, 1984 issued Amendment No. 12 to the Unit's Operating License, which changed the source range monitoring instrumentation down-scale trip value in the Technical Specifications from 3.0 CPS to 0.7 CPS. (The down-scale trip prohibits control rod movement.) Consequently, even though the sources were severely depleted, this change allowed startup of the Unit on April 22, 1984, at the conclusion of the recertification program and the Technical Specification Review Program. Since April 22, 1984, some regeneration of the startup sources has occurred; therefore, during the near term, virtually continuous operation at power levels in excess of 2% core thermal power is required to continue to regenerate the sources and to

*The requisite safety showing having been made, the arguments presented below do not constitute putting economics ahead of safety. Rather, it is appropriate to consider economics once such findings have been made.

maintain them at an activity level which could be sufficient to allow a restart of the Unit should an outage occur.

If these startup sources are not regenerated and are allowed to decay for any significant period of time, they will have to be replaced. Such a replacement operation is a time-consuming task which will require the allocation of significant financial and human resources. The replacement of startup sources entails the removal of the drywell head, the reactor vessel head, the steam dryer, steam separator, selected fuel bundles and vibration monitoring instrumentation, an operation which is not undertaken without some potentially adverse consequences. For example, there will be some small but finite personnel radiation exposure, which would otherwise be avoided if the startup sources were regenerated rather than replaced. There also will be an added stress cycle on the head, vessel and studs. Manpower which could have been used in further preparation for full power operations will be diverted to replace the startup sources. The estimated time to replace the neutron startup sources and reinstall affected portions of the reactor vessel internals vibration monitoring instrumentation system (which is required by license condition) is at least six to eight weeks. To provide for contingencies, MP&L has ordered a set of replacement startup neutron sources. These sources are not anticipated to be available onsite until July 1984. In light of this fact, it is projected that the Unit would unnecessarily be in a forced shutdown condition for at least three to seven weeks after the diesel generator has been restored to an operable status. As described below, this would result in significant additional financial costs. As a regulated utility, it is incumbent upon MP&L to avoid such unnecessary expenditures.

Assuming that continued low power operation is authorized, once the startup sources are sufficiently regenerated, MP&L is considering voluntarily shutting down GGNS Unit 1 for approximately three weeks in order to conduct certain surveillance tests and maintenance for which plant shutdown is required. Since these surveillance tests are required to be conducted within the next few months, MP&L is considering conducting these activities prior to the commencement of power ascension testing so as to avoid still further interruptions of the power ascension testing program and delay of commercial operation of the Unit. It is anticipated that the startup sources will be sufficiently regenerated so as to allow this voluntary shutdown to commence in mid-June, 1984. This voluntary outage would be completed during the same period that the diesel generator reassembly and testing is being performed and would be completed prior to the anticipated date of the issuance of the Full Power Operating License for GGNS Unit 1 and, therefore, prior to the time that MP&L would be authorized to proceed with the power ascension testing program. If GGNS Unit 1 were required to be shut down before the startup sources have been sufficiently regenerated, then the startup sources would have to be replaced prior to the commencement of the power ascension testing program, thereby resulting in further delays in commercial operation of the Unit. If this is the case, the delay in commercial operation would have a substantial adverse financial impact on the owners of the Grand Gulf Nuclear Station and their customers.

Middle South Energy, Inc. (MSE) and South Mississippi Electric Power Association (SMEPA) own undivided ownership interests of 90% and 10%, respectively, in the Grand Gulf Nuclear Station. Any delay in commercial operation of the Unit results in MSE's share in Grand Gulf, Unit No. 1, increasing by approximately $35 million per month, primarily as a result of on-going financing charges. In addition, SMEPA also has experienced problems in financing its share in Grand Gulf, Unit No. 1, and, if the commercial operation date of the Unit is delayed to replace the startup sources, it would expect to incur delay costs relating to its on-going financing charges. Furthermore, in various agreements with banks and other large lenders, relating to the financing of Grand Gulf, Unit No. 1, MSE covenanted that completion of the Unit would be no later than December 31, 1984. Under those financing arrangements, the Unit would be considered complete if, among other things, it was licensed, fully tested and ready for commercial operation. In the event this covenant is not fulfilled, MSE's first mortgage bonds and bank borrowings will become due and payable, unless extensions of time can be arranged. MSE presently has outstanding bank borrowings of approximately $1,884 million and first mortgage bonds of approximately $426 million, which would be affected by this covenant.

MSE is presently seeking from its principal creditor groups various approvals to extend the stipulated completion date for Grand Gulf, Unit No. 1, as set forth in the various financing agreements. However, MSE cannot determine, at this time, whether such an extension of time will be allowed or, if so, for how long the extension will be. Unless an extension of the stipulated completion date is arranged, a shutdown of the Unit which results in the necessity to replace the startup sources could delay completion of the Unit to beyond the stipulated completion date, which could thereby result in a default under MSE's major credit arrangements. Furthermore, an involuntary shutdown of the Unit at this time could create an atmosphere of uncertainty as to the ultimate commercial operation date of the Unit which could adversely affect MSE's ability to negotiate an extension of the stipulated completion date. This atmosphere of uncertainty also could adversely affect the ability of Middle South Utilities, Inc., MSE's parent company, to issue common stock to raise funds necessary to help finance the Unit.

In summary, if the NRC does not grant for Grand Gulf, Unit No. 1, an exemption from GDC-17 to allow the Unit to continue to operate at up to 5% power, the Owners of the Grand Gulf Nuclear Station will be required to shut down the Unit. If the Unit is shut down for this reason and can not be restarted before its in-core startup neutron sources have decayed below acceptable activity levels, the cost of replacement of the startup sources would have a significant direct financial impact on the Owners. Furthermore, a shutdown of the Unit resulting in replacement of the startup sources could result in some delay in the completion and ultimate commercial operation of the Unit, resulting in additional costs to MSE alone of approximately $35 million per month. SMEPA would be expected to incur similar delay costs in proportion to its 10% ownership interest in the facility. The prejudice to the Owners of the Grand Gulf Nuclear Station by not allowing the Unit to continue to operate at up to 5% power, cannot be justified under the circumstances, nor is it in the public interest to do so.

3. Training Benefits

MP&L has endeavored to upgrade the experience of its operators through operation of the plant with the reactor critical. This has provided a substantial enhancement to the experience of the operating staff. Should the Unit

have to be shut down and remain down while the diesel generator inspection program progresses, the opportunity to obtain additional, valuable operating experience will be lost. The training experience which can be gained through continued low power operation is unquestionably in the public interest.

4. Good Faith

MP&L has done everything that it reasonably can to resolve the concerns of the NRC with regard to TDI diesel generators, as they relate to Grand Gulf, Unit No. 1, without unnecessarily delaying the power ascension and, ultimately, commercial operation of the Unit.

MP&L was instrumental in forming the TDI Diesel Generator Owners' Group, which is investigating and addressing the generic problems with TDI diesel generators, and, as a basis for operating Grand Gulf, Unit No. 1, at full power, has submitted numerous reports, including those dated February 20, 1984, April 17, 1984, May 6, 1984, and May 14, 1984, concerning the MP&L program to verify and enhance the reliability of the TDI diesel generators at Grand Gulf, Unit No. 1. As indicated in these reports, in late 1983/early 1984, MP&L performed detailed inspections of both of the GGNS Unit 1 TDI diesel generators, replaced selected engine components with those of improved design, and performed extensive testing of both diesel generators after reassembly. Furthermore, in order to provide additional assurance of reliable onsite emergency power supply, in March, 1984, MP&L installed and successfully tested a highly reliable Gas Turbine Generator (GTG) system at the GGNS site. This GTG system is capable of supplying necessary Unit 1 safe shutdown loads in the unlikely event of a loss of all offsite power in conjunction with the failure of both TDI standby diesel generators.

The above-mentioned submittals document a substantial effort which the owners of the Grand Gulf Nuclear Station have made to ensure that the Grand Gulf TDI diesel generators are reliable. Based in particular on the submittal to the NRC dated May 6, 1984, MP&L believes that it has demonstrated not only the reliability of the Grand Gulf TDI diesel generators but also that of the Grand Gulf onsite/offsite power supply system. These costly and time consuming efforts are evidence of the good faith of MP&L in working to resolve the industry-wide problems associated with TDI diesel generators and weigh heavily in favor of granting the exemption.

5. Fairness to Applicant

On May 22, 1984, the NRC ordered MP&L to completely disassemble and inspect one of the Grand Gulf, Unit No. 1, TDI diesel generators. This Order was issued despite the fact that MSE believes that it demonstrated to the NRC that the Grand Gulf TDI diesel generators are reliable and fully comply with GDC-17, such that no further inspections were needed until the first refueling outage and despite the fact that the NRC has not concluded that the Grand Gulf TDI diesel generators are unreliable. (See Transcript of the Commission's Public Meeting on Grand Gulf Diesel Generator Inspection Order; dated May 25, 1984, p. 15.) Under the circumstances, fairness to the applicant would indicate that Unit No. 1 not be required to shutdown and, accordingly, that the exemption be issued.

6. Public Interest

The General Design Criteria are codified in 10CFR 50, Appendix A. The Introduction to this Appendix states in pertinent part:

> The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. (emphasis added).

Two important points are made in the excerpt from the Introduction just quoted: (1) the standard for the GDC is reasonable assurance; and (2) operation is not required to be risk-free. Therefore, in determining the suitability of an exemption from GDC 17, these underlying policies must be considered. The absence of certainty with respect to diesel generators or other sources of offsite or onsite power does not in itself imply that the purpose of GDC 17 is defeated.

The GDC refer to systems which are "important to safety". There is no question that the emergency on-site power systems such as diesel generators are important to the safety of the plant when operated at full power.

There are, however, threshold levels of power at or below which the plant can operate without having fully qualified on-site A/C power sources because the operability of such power sources would have little or no effect upon the safety of the plant. In such instances, it is the inherent physics of the operation of the plant which determines the safety to the public, not the operation of the diesel generators themselves. Furthermore, for those power levels at which diesel generators would be required, there is no requirement of absolute certainty of the operation of the systems. What is required is reasonable assurance.

When viewed in this light, GDC 17 is not to be applied in a rigid fashion. Rather, if, as we conclude and the NRC staff concluded in the safety evaluation attached to the May 22, 1984 Order, that there are power levels, at which operation without fully qualified and redundant onsite emergency power sources is a safe as comparable plants with such sources, then an explicit exemption from GDC 17 is justified.

MP&L has demonstrated in this exemption request that the public health and safety will not be endangered by low power operation of GGNS Unit 1 pursuant to the exemption. Given this assurance of protection, there is no public interest in adherence to the literal requirements of GDC 17 for the activities in question.