

BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

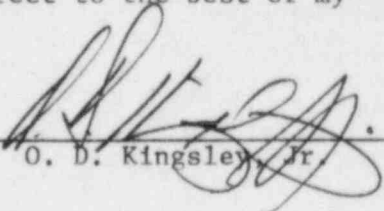
LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF
MISSISSIPPI POWER & LIGHT COMPANY
and
MIDDLE SOUTH ENERGY, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION

AFFIRMATION

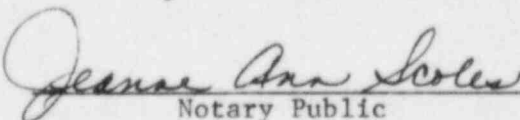
I, O. D. Kingsley, Jr., being duly sworn, stated that I am Vice President, Nuclear Operations of Mississippi Power & Light Company; that on behalf of Mississippi Power & Light Company, Middle South Energy, Inc., and South Mississippi Electric Power Association I am authorized by Mississippi Power & Light Company to sign and file with the Nuclear Regulatory Commission, this application for amendment of the Operating License of the Grand Gulf Nuclear Station; that I signed this application as Vice President, Nuclear Operations of Mississippi Power & Light Company; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.


O. D. Kingsley, Jr.

STATE OF MISSISSIPPI
COUNTY OF HINDS

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 6th day of May, 1985.

(SEAL)


Notary Public

My commission expires:

September 21, 1987

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SUBJECT: NLS-84/05

Technical Specifications 5.6.1.b and 5.6.3, page 5-6

DISCUSSION:

It is proposed to change the nominal center-to-center distance between fuel assemblies placed in the storage racks in the GGNS spent fuel storage pools from 12 inches to 6.26 inches and to change the maximum spent fuel storage capacity at GGNS from 1270 fuel assemblies in the spent fuel storage pool to 4348 fuel assemblies in the spent fuel pool and 800 fuel assemblies in the upper containment pool. This change will accommodate the proposed replacement of the current GGNS low density aluminum spent fuel storage racks with Joseph Oat Corporation designed/constructed high density spent fuel storage racks.

NRC has currently licensed GGNS Unit 1 with a capacity of 170 fuel storage assemblies in the upper containment pool. The capacity of these fuel storage racks are not addressed in Section 5 of the current technical specifications. MP&L is including the upper containment pool fuel storage racks in this proposal as a conservative measure and for completeness.

JUSTIFICATION:

GGNS was designed with two spent fuel storage pools. One is adjacent to the reactor cavity inside containment, hereinafter referred to as the "upper containment pool," and was designed for storage of spent fuel during refueling activities and other special evolutions, until such time as it could be moved to longer term storage in the other pool or replaced in the reactor vessel during core reload. The second pool, hereinafter referred to as the "spent fuel pool," is located in the auxiliary building and was designed for longer term storage of spent fuel during reactor operation until such time as it could be packaged and shipped to a reprocessing facility. The combined design capacity of these pools is 1440 spaces (approximately 1.8 full cores). The GGNS Final Safety Analysis Report addresses the safety implications of these pools to include relevant parameters associated with criticality, structural integrity, and cooling (Safety Evaluation, Docket No. 50-416). The evaluation found the environmental and safety impacts of such storage to be acceptable.

On April 17, 1977, the federal government issued a policy statement on commercial reprocessing of spent nuclear fuel which effectively eliminated reprocessing as part of the relatively near term nuclear fuel cycle. On October 18, 1977, the Generic Environmental Statement on Mixed Oxide fuels (GESMO) proceedings were deferred indefinitely. The combined effect of this national policy was to leave operating nuclear plants, like GGNS, without a repository for the spent fuel previously generated or being generated. Thus, MP&L has essentially no alternative except for reracking of the GGNS spent fuel pools to further increase its storage capacity.

With this application, MP&L is requesting approval to use Joseph Oat Corporation designed/constructed high density spent fuel racks to increase the Grand Gulf Nuclear Station (GGNS) spent fuel pool capacity to 5148

total spent fuel storage spaces - 800 spaces in the upper containment pool and 4348 spaces in the spent fuel pool. This modification would extend the GGNS fuel storage capability from the current 1990 date to the year 2004.

The increase in GGNS spent fuel storage capacity would be accomplished by replacing the existing low density non-poison racks with neutron absorbing high density racks.

The analysis summary supporting the proposed amendment request is set forth in Attachment 2. This analysis addresses the applicable requirements set forth in the NRC's Guidance on Spent Fuel Pool Modifications dated April 14, 1978 (revised January 18, 1979).

SIGNIFICANT HAZARDS CONSIDERATION:

Mississippi Power and Light (MP&L) has made the determination that this amendment request involves no significant hazards considerations by evaluating it in accordance with the requirements of 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- 2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- 3) Involve a significant reduction in a margin of safety.

The following evaluation demonstrates by reference to the analysis summary contained in Attachment 2 that not one of the three significant safety hazards consideration guidelines are met. Each of the three standards is discussed below.

o First Standard

Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The analysis of this proposed reracking has been accomplished using current NRC Staff accepted codes and standards. The results of the analysis meet the specified acceptance criteria set forth in these standards.

From our analyses and regulatory document reviews, MP&L has identified the following potential accident scenarios: 1) fuel damage from an equipment drop onto the spent fuel; 2) thermal-hydraulic concerns of fuel pool cooling; 3) seismic event; 4) spent fuel assembly drop; 5) and natural disaster. The probability of occurrence of any of these accidents is not affected by the racks themselves; therefore, reracking will not increase the probability of occurrence of these accidents.

The consequences of the equipment drop accident have been evaluated with conclusions on page 7-6 of Attachment 2. The cask handling crane stops and administrative controls will continue to be used to prevent heavy loads and casks from being moved into the fuel pool area; therefore, the spent fuel cask drop accident is not credible and was not evaluated. Thus, the consequences of this type accident will not be significantly increased from previous analyses as described in the GGNS FSAR section 15.7.4.3.

The thermal-hydraulic concerns of fuel pool cooling have been evaluated (Section 5 of Attachment 2). As indicated in Table 5.2.1 (page 5-18 of Attachment 2), neither the peak local coolant temperature nor the peak local cladding temperature significantly increases due to the increased density of spent fuel in the pool resulting from the proposed high density racks modification. The consequences of a loss of fuel pool cooling accident will not be significantly increased from previously evaluated accidents by the installation of proposed high density racks.

The consequences of a seismic event have been evaluated. The proposed high density racks were evaluated against the appropriate NRC standards, GGNS FSAR, and applicable codes. The results of the seismic and structural analysis show that the proposed racks meet all of the NRC structural acceptance criteria and are consistent with licensing reports on high density fuel racks submitted by Fermi II and Quad Cities nuclear stations, as indicated on page 6-1 of Attachment 2. Thus, the consequences of seismic events will not significantly increase from previously evaluated seismic events.

The consequences of a spent fuel assembly drop accident are described on page 4-14 and Section 7 of Attachment 2. The radiological consequences for this type accident are unchanged from previous analyses presented in the GGNS FSAR Section 15.7.4.3, and K_{eff} is shown to always be less than the NRC acceptance criteria of 0.95. Thus, the consequences of this type accident will not be significantly increased from previously evaluated spent fuel assembly drop accidents.

The fuel storage facilities are designed to seismic Category I requirements to prevent earthquake damage to the stored fuel as stated on page 6-1 of Attachment 2. From the analysis it has been determined that the spent fuel storage arrangement and design meet the safety design bases and satisfy the intent of Regulatory Guide 1.13 which is intended to preclude any deleterious effects on spent fuel storage integrity due to natural phenomena such as earthquakes, tornadoes, hurricanes, and floods. Therefore, the consequences of a natural disaster accident will not significantly increase from previously evaluated natural disaster analyses.

By the above rationale MP&L believes that the proposed GGNS spent fuel pool high density racks will not involve a significant increase

in the probability or consequences of an accident previously evaluated.

o Second Standard

Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

MP&L has evaluated the proposed reracking in accordance with the "NRC Position for Review and Acceptance of Spent Fuel Storage and Handling Applications", appropriate NRC Regulatory Guides, appropriate sections in the NRC Standard Review Plan, and appropriate industry codes and standards. Based upon MP&L's analysis and review of NRC evaluations and industry standards and codes, MP&L believes that the proposed reracking does not in any way create the possibility of a new or different kind of accident than those previously evaluated.

o Third Standard

Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

Consideration of the issue of margin of safety when applied to a reracking modification requires the following areas to be addressed (as established by the NRC Staff safety evaluation review process):

1. Nuclear criticality considerations,
2. Thermal-hydraulic considerations,
3. Mechanical, material, and structural considerations.

The margin of safety that has been established for nuclear criticality considerations is that the neutron multiplication factor in the spent fuel pool remains less than or equal to 0.95, including all uncertainties under all conditions. The criticality analysis for the proposed modification is discussed in Section 4 of Attachment 2.

The methods utilized in the analysis conform with ANSI N18.2-1973, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants"; ANSI N210-1976, "Design Objectives for LWR Spent Fuel Storage Facilities at Nuclear Power Stations"; Regulatory Guide 3.41, "Validation of Computational Methods for Nuclear Criticality Safety" (and related ANSI N16.9-1975); NRC Standard Review Plan, Section 9.1.2, "Spent Fuel Storage"; and the NRC guidance, "NRC Position for Review and Acceptance of Spent Fuel Storage and Handling Applications."

The results of this analysis indicate that K_{eff} is always less than 0.95 including all uncertainties at a 95/95 probability/confidence level thereby meeting the acceptance criteria for criticality. Minimum design requirements for poison concentrations are discussed in Section 4.4.3 of Attachment 2. Aspects of the construction process and quality assurance controls which establish confidence that the minimum poison requirements are met in the high density racks are discussed in Attachment 3 to this submittal. The retention of poison material will be monitored by a surveillance program at each refueling outage. This program is described in Section 10 of Attachment 2. MP&L has concluded that proposed high density racks do not involve a significant reduction in the margin of safety for nuclear criticality.

When evaluating thermal-hydraulics concerns, the areas addressed to determine if there is a significant reduction in a margin of safety are: 1) maximum fuel temperature, and 2) the increase in temperature of the water in the pool. The thermal-hydraulic evaluation is described in Section 5 of Attachment 2. Results of these analyses show that fuel cladding temperatures under abnormal conditions are sufficiently low to preclude failures and that boiling does not occur. In addition, the existing spent fuel cooling system as modified per Operating License Conditions 2.C(20) and (21), will provide the capacity to maintain an acceptable temperature range for normal and abnormal heat loads. The cooling system is described in the GGNS FSAR Section 9.1.3. Thus, there is no significant reduction in the margin of safety from a thermal-hydraulic standpoint or from a spent fuel cooling standpoint.

The mechanical, material, and structural considerations of the proposed high density racks are described in Attachment 2. The racks are designed in accordance with "NRC Position for Review and Acceptance of Spent Fuel Storage and Handling Applications" dated April 14, 1978 and revised January 18, 1979. The racks are designed to Seismic Category 1 requirements and are classified as ANS Safety Class 3 and constructed to ASME Code Class 3 Component Support Structures except where the weld stresses are less than twenty (20) percent of yield in which case the vendor visual inspection criteria was applied in lieu of NF visual inspection criteria. The racks are designed to withstand loads which may result from fuel handling accidents and from the maximum uplift force of the fuel handling crane. The materials utilized are compatible with the spent fuel pool environment and the spent fuel assemblies. The structural considerations of the racks provide a sufficient margin of safety against tilting and sliding such that the racks do not impact each other or impact the pool walls. Structural integrity of the pool structure is maintained with additional dead load, live load, thermal load, wind load, and seismic load considerations; therefore, the margin of safety is not significantly reduced by the proposed high density racks.

MP&L believes that the proposed GGNS spent fuel pool high density racks modification does not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- 2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- 3) Involve a significant reduction in a margin of safety.

As such, MP&L has determined and submits that the proposed high density racks modification described herein does not involve a significant hazard.

ENVIRONMENTAL CONSIDERATION:

MP&L has evaluated the proposed high density racks modification in accordance with the requirements of 10 CFR 51.5 and has found that the proposed high density racks do not involve an environmental consideration. In MP&L's analysis and review of NRC evaluations, regulatory documents, and related industry experience, MP&L finds, as indicated in Section 9 of Attachment 2, that the proposed high density racks modification does not involve:

- 1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the Final Environmental Statement (FES) as modified by the NRC staff's testimony to the Atomic Safety and Licensing Board (ASLB), supplements to the FES, environmental impact appraisals, or in any decisions of the ASLB; or
- 2) a significant change in effluents or power level (in accordance with 10CFR51.5(b)(2)); or
- 3) a matter not previously reviewed and evaluated in the documents specified in (1) above, which may have a significant adverse environmental impact.

Therefore, MP&L has determined and submits that the proposed high density racks do not involve an environmental consideration.