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Grand Gulf Nuclear Station

Operations.

September 18, 1997

U.S. Nuclear Regulatory Commission Mail Station P1-37 Washington, D.C. 20555

Document Control Desk Attention:

Subject: Grand Gulf Nuclear Station Docket No. 50-416 License No. NPF-29 Cycle 10 Reload Proposed Amendment to the Operating License (PCOL-97/003)

GNRO-97/00087

Gentlemen:

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PDR

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PDR

In accordance with 10CFR50.90, Entergy Operations, Inc. is submitting by this letter a proposed amendment to the Grand Gulf Nuclear Station (GGNS) Operating License.

The proposed amendment requests changes to those Technical Specifications (TS) required to support Grand Gulf Nuclear Station. Cycle 10 operation. These changes include a change to the minimum critical power safety limit ratio (SLMCPR). Cycle 10 will be the second cycle of operation with a mixed core of Siemens Power Corporation (SPC) 9x9-5 and General Elc stric (GE) GE11 reload fuel.

The proposed amendment reflects a decrease of the two recirculation loop SLMCPR limit to 1.11 and a single recirculation loop SLMCPR limit to 1.12.

On June 10, 1997, GE submitted Licensing Topical Report (LTR) No. NEDC-32694P, Power Distribution Uncertainties for Safety Limit MCPR Evaluations that addresses the power distribution uncertainties with 3D MONICORE (Reference GE letter from R. J. Reda to the Document Control Desk, submitted June 10, 1997). The LTR removes undue conservatism in GE methodology for calculating MCPR safety limits. Entergy intended to use these reduced uncertainties in developing Grand Gulf Nuclear Change : Line 1984

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Station's Cycle 10 SLMCPR. Therefore, on July 11, 1997, Entergy Operations submitted GNRO-97/00067 addressed to the Reactor Systems Branch (Attention: J. E. Lyons) to support the above LTR and also requested the Commission for an expeditious review and approval of the LTR. Subsequent commercial issues were raised by GE which could not be resolved to the satisfaction of Entergy. Therefore, Entergy developed this PCOL without the use of the above uncertainties.

In accordance with the provisions of 10CFR50.4, the signed original of the requested amendment is enclosed. Attachment 2 provides the discussion and justification for decrease in the SLMCPR and supports the requested amendment. This amendment request has been reviewed and accepted by the Plant Safety Review Committee and the Safety Review Committee.

Based on the guidelines in 10CFR50.92, Entergy Operations has concluded that this proposed amendment involves no significant hazards considerations. Attachment 2 details the basis for this determination. Attachment 3 includes marked-up pages of the GGNS Technical Specifications and Bases.

Attachment 4 provides additional information regarding the two-loop and singleloop cycle specific SLMCPRs for Cycle 10. The additional information is based on the input provided by General Electric. General Electric considers the information contained in Attachment 4 to be proprietary. In accordance with the requirements to 10CFR2.790(b), an affidavit is enclosed to support the withholding of the information contained in Attachment 4.

Entergy Operations requests NRC approval and issuance of Technical Specifications changes by March 15, 1998 to allow related work activities to be implemented prior to the Grand Gulf Refueling Outage 9 now scheduled to begin April 11, 1998.

Yours truly.

Bill Laton for J. Hagan.

JJH/RME/ACG/ attachments:

- 1. Affirmation per 10CFR50.30
- 2. GGNS PCOL-96/008
- 3. Mark-up of Affected Technical Specification Pages
- Additional Information Regarding the 1.11 Cycle Specific SLMCPR for Grand Gulf -Cycle 10
- 5. GE Affidavit to Support the Withholding of the Information

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CC:

Ms. J. L. Dixon-Herrity, GGNS Senior Resident (w/a) Mr. L. J. Smith (Wise Carter) (w/o) Mr. N. S. Reynolds (w/o) Mr. H. L. Thomas (w/o)

Mr. E. W. Merschoff (w/a) Regional Administrator U.S. Nuclear Regulatory Commission Region IV 611 Ryan Plaza Drive, Suite 400 Arlington, TX 76011

Mr. J. N. Donohew, Project Manager (w/2) Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Mail Stop 13H3 Washington, D.C. 20555

Dr. E. F. Thompson (w/a) State Health Officer State Board of Health P.O. Box 1700 Jackson, Mississippi 39205

Attachment 1 to GNRO - 97/00000

#### BEFORE THE

# UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

### IN THE MATTER OF

MISSISSIPPI POWER & LIGHT COMPANY and SYSTEM ENERGY RESOURCES, INC. and SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION and ENTERGY OPERATIONS, INC.

#### AFFIRMATION

I, F. W. Titus, being duly sworn, state that I am Vice President, Engineering of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, Inc. 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, Engineering of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my kncs indge, information and belief.

STATE OF MISSISSIPPI COUNTY OF HINDS

SUBSCRIBED AND SWORN TO before me, a Notary Fublic, in and for the County and State above named, this 17th day of Scotember 1997.

(SEAL)

(Imy a. Blaylock) Notary Public

My commission expires: Note::: Public State of Mississiopi At Large My Commission Explore: June 17, 8001 BONDED 7WRU HEIDEN-MARC JETTI, 1960

Attachment 2 to GNRO-97/00087

# GGNS PCOL-97/003

#### A. AFFECTED TECHNICAL SPECIFICATIONS

1. The following Technical Specifications are affected by the proposed change:

2.1.1 Reactor Core Safety Limits

5.6.5 Core Operating Limits Report

2. The following Technical Specification Bases are affected by the proposed change. Since Technical Specification Bases are controlled under 10CFR50.59 Program, the markup of the Bases Sections are provided for information only.

B 2.1.1.2 MCPR

B 3.2.2 Minimum Critical Power Ratio (MCPR)

#### **B. DESCRIPTION OF CHANGES**

- <u>Technical Specification 2.1.1.2</u>: Change the Safety Limit MCPR for Two Loop Operation and Single Loop Operation to 1.11 and 2.12, respectively and change the footnote referring to Cycle 9 operation for Cycle 10 operation.
- Technical Specification 5.6.5 Change the footnote referring to Cycle 9 operation for Cycle 10 operation.
- <u>Technical Specification Bases</u> Add a statement that the operating limits will be based on the calculated MCPR safety limits rather than the rounded values reported in Technical Specification 2.1.1.2 and deletion of an unnecessary reference.

### C. BACKCROUND

Grand Gulf Cycle 10 is the second cycle of operation with GE11 reload fuel. The Cycle 10 core will contain 560 GE11 bundles and 240 twice-burnt Siemens 9x9-5 bundles. A conventional corc design with a checkerboard fresh fuel loading pattern is utilized.

The GGNS Cycle 10 MCPR safety limits were developed with General Electric's cycle-specific MCPR safety limit methodol, gy. This methodology has been presented to the NRC Staff and has been submitted as Amendment 25 to GESTAR-II. The approved plant uncertainties reported in GETAB were credited in this evaluation although recent GE topicals have concluded that reductions in a number of these uncertainties are warranted.

Grand Gulf Nuclear Station Cycle 10, PCOL-97/003

GE's cycle-specific methodology includes objective measures for evaluating the flatness of the core and bundle power distributions. These measures are reported below for the GGNS Cycle 10 core and the core used to develop GE11 generic MCPR safety limit. Table 1 of Artachment 4 contains additional results.

Description	Generic GE11	Grand Gulf Cycle 10
Limiting Cycle Exposure Point	PHE	EOC-1K
Core MCPR (for limiting rod pattern)	1.257	1.2555
% uncontrolled bundles within 0.20 CPR	2.6%	16.0%
MCPR Importance Pasameter, MIP	1.662	3.851
R-Factor Importance Parameter, RIP	14.3%	27.6%
Calculated Safety Limit MCPR	1.07	1.11

### Comparison of Generic GE11 and Grand Gulf Cycle 10 Cores

The Siemens 9x9-5 bundles were modeled with the approach applied in GGNS Cycle 9 and reported in PCOL 96/008, Rev. 1 (Letter dated September 5, 1996 from C. R. Hutchinson addressed to the Document Control Desk). New coefficients were developed for GE's GE/GL02 correlation for the Siemens bundles and bundle R-factors were developed in a manner consistent with GE's methodology. A conservative CPR uncertainty was applied based on comparisons of this modified GEXL correlation to both Siemens' ANFB correlation (PCOL 96/008, 'kev. 1) and Siemens' critical power test data (GNRO-96/00117, letter from J. J. Hagan addressed to the Document Control Desk, submitted October 22, 1996). The GGNS Cycle 10 analysis determined that the Siemens bundles contributed no rods subject to boiling transition and consequently have no impact on the calculated MCPR safety limits.

#### D. PROPOSED 7S CHANGES

The proposed changes to the Technical Specifications are to change the MCPR satety limit values for two-loop and single-loop operation to those values calculated by GE's methodology for GGNS Cycle 10. These marked-up Technical Specifications are included as Attachment 3.

The GESTAR reference is maintained on the list of documents that have been reviewed and approved by the NRC without a revision number to maintain consistency with the other COLR methodology references and to allow reference to the upcoming revision to GESTAR which will include this cycle-specific analytical approach for the MCPR safety limit. The SPC reports currently listed in the Technical Specifications will be unaffected since SPC fuel will remain in the Cycle 10 core.

The Cycle 9 MCPR safety limit report will remain in Technical Specification 5.6.5 since it contains information regarding the modeling of the Siemens bundles that is not included in GESTAR. The cycle specific footnote will be maintained since Amendment 25 to GESTAR has not yet been approved.

#### E. JUSTIFICATION

The MCPR Safety Limit is developed to assure compliance with General Design Criterion 10 of 10CFR50 Appendix A. The Bases to Technical Specification 2.1.1 states that "The MCPR SL ensures sufficient conservatism in the operating MCPR limit that, in the event of an Anticipated Operational Occurrence (AOO) from the limiting condition of operation, at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition" The new MCPR SL was developed with considerable conservatism in the methodology.

Attachment 4 of this PCOL documents additional information for the 1.11 Cycle specific SLMCPR. The information is based on the GE provided input.

### F. CONCLUSION

For two-loop operation, a Safety Limit MCPR of 1.11 was demonstrated to be adequate to ensure that 99.9 percent of the rods in the core avoid a boiling transition during the most limiting AOO. For single-loop operation, the limit is increased by 0.01 to 1.12. The MCPR fuel cladding integrity safety limits for GGNS Cycle 10 two-loop and single-loop operation were determined by applying GE's cycle-specific MCPR safety limit methodology to the GGNS Cycle 10 core design. This approach has been presented to the NRC Staff and contains considerable conservatism in the applied uncertainties. The SPC fuel was explicitly considered and found to not contribute to the Cycle 10 MCPR safety limit. The resulting values, therefore, represent bounding measures of the GGNS Cycle 10 MCPR safety limits.

# G. SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations, Inc. proposes to change the current Grand Gulf Nuclear Station Technical Specifications. The specific change is to modify the Minimum Critical Power Ratio (MCPK) safety limits reported in Technical Specification 2.1.1.2, and associated Bases changes. The proposed change is necessary in order to reflect the results of the GGNS Cycle 10 analysis.

The Commission has provided standards for determining whether no significant hazards considerations exists as stated in 10 CFR 50.92 (c). A proposed amendment to an operating license involves no significant hazards if 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; (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.

Entergy Operations, Inc. has evaluated the no significant hazards consideration in its request for this license amendment and determined that no significant hazards considerations result from this change. In accordance with 10 CFR 50.91(a), Entergy Operations, Inc. is providing the analysis of the proposed amendment against the three standards in 10 CFR 50.92(c). A description of the no significant hazards consideration determination follows:

# The proposed change does not significantly increase the probability or consequences of an accident previously evaluated.

The Minimum Critical Power Ratio (MCPR) safety limit is defined in the Bases to Technical Specification 2.1.1 as that limit which "ensures that during normal operation and during Anticipated Operational Occurrences (AOOs), at least 99.9% of the fuel rods in the core do not experience transition boiling." The MCPR safety limit is re-evaluated for each reload and, for GGNS Cycle 10, the analyses have concluded that a two-loop MCPR safety limit of 1.11 based on the application of GE's cycle-specific MCPR safety limit methodology is necessary to ensure that this acceptance criterion is satisfied. For single-loop operation, a MCPR safety limit of 1.12 based on GE's cycle-specific MCPR safety limit methodology was determined to be necessary. Core MCPR operating limits are developed to support the Technical Specification 3.2 requirements and ensure these safety limits are maintained in the event of the worst-case transien! Since the MCPR safety limit will be maintained at all times, operation under the proposed changes will ensure at least 99.9% of the fuel rods in the core do not experience transition boiling Therefore, these changes to the Minimum Critical Power Ratio (MCPR) safety limit do not affect the probability or consequences of an accident.

GE's GESTAR-II approved methodology will continue to be implemented and has no effect on the probability or consequences of any accidents previously evaluated. One exception to GESTAR is that the mis-oriented and mis-located bundle events will continue to be analyzed as accidents subject to the acceptance criteria in the current licensing basis. The design of the GE11 fuel bundles is such that the bundles are not likely to be mis-oriented or mis-located and the normal administrative controls will be in effect for assuring proper orientation and location. Therefore, the probability of a fuel loading error is not increased. This analysis ensures that postulated dose releases will not exceed a small fraction (10 percent) of 10CFR100 limits. Therefore, the probability or consequences of accidents previously evaluated are unchanged.

II. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The GE11 fuel to be used in Cycle 10 is of a design compatible with fuel present in the core and used in the previous cycle. Therefore, the GE11 fuel will not create the possibility of a new or different kind of accident. The proposed changes do not involve any new modes of operation, any changes to setpoints, or any plant modifications. They introduce revised MCPR safety limits that have been proven to be acceptable for Cycle 10 operation. Compliance with the applicable criterion for incipient boiling transition continues to be ensured. The proposed MCPR safety limits do not result in the creation of any new precursors to an accident.

Therefore, the proposed changes do not create the possibility of a new or different type of accident from any accident previously evaluated.

# III. The proposed change does not involve a significant reduction in a margin of safety.

The MCPR safety limits have been evaluated in accordance with GE's current cycle-specific methodology to ensure that during normal operation and during AOOs, at least 99.9% of the fuel rods in the core are not expected to experience transition boiling. Unless otherwise approved, GGNS will implement only the NRC-approved revisions to GE's GESTAR methodology. This GE methodology is similar to those SPC reports currently listed in TS 5.6.5 and it will be applied in a similar, conservative fashion. One exception to GESTAR is that the misoriented and mis-located bundle events will continue to be analyzed as accidents subject to the acceptance criteria in the current licensing basis. This analysis ensures that postulated dose releases will not exceed a small fraction (10 percent) of 10CFF 100 limits. On this basis, the implementation of this GE methodology does not involve a significant reduction in a margin of safety.