December 21, 1998

FOR: The Commissioners

FROM: William D. Travers /s/
Executive Director for Operations

SUBJECT: AGENCY POLICY REGARDING LICENSEE RECAPTURE OF LOW-POWER TESTING OR SHUTDOWN TIME FOR NUCLEAR POWER PLANTS

PURPOSE:

To obtain Commission approval of a policy issue concerning recapture of low-power testing or shutdown time for nuclear power plants not in commercial operation because of unusual, unforeseen, or exigent circumstances.

SUMMARY:

The Nuclear Regulatory Commission (NRC) has received a request from Entergy Operations, Inc., the licensee for the Grand Gulf Nuclear Station (GGNS), to amend the expiration date of the GGNS license. The proposed amendment would recover time the plant spent in an extended low-power testing condition before receiving a full-power operating license (FPOL). Because a number of legal, policy, and technical issues are associated with granting the amendment request, the staff wishes to inform the Commission of this license amendment request and other types of recapture situations.

BACKGROUND:

On June 16, 1982, GGNS was issued a low-power operating license (LPOL) to operate up to 5-percent rated power. After a number of technical specification and startup testing issues were resolved, the Commission amended the LPOL on August 31, 1984, to allow operation up to 100-percent rated power. In response to a court challenge to the amendment, the Commission subsequently directed the staff to issue a separate FPOL to GGNS. *Mississippi Power & Light Co., et al*. (Grand Gulf Nuclear Station, Unit 1), CLI-84-19, 20 NRC 1055 (1984). On November 1, 1984, the staff issued to GGNS an FPOL with an expiration date of June 16, 2022, 40 years from the date of issuance of the LPOL. Additional background regarding the period GGNS was in low-power testing is available in CLI-84-19 and the Director's Decision Under 10 CFR 2.206 in *Mississippi Power & Light Co., et al*. (Grand Gulf Nuclear Station Unit 1), 20 NRC 788 (1984).

The GGNS amendment requests approximately a 28.5-month extension of the expiration date of the FPOL to November 1, 2024, 40 years from the date of issuance of the FPOL. In its application, the licensee argues that in accordance with the Commission's regulations in 10 CFR 50.51, the FPOL term should be 40 years from the date of issuance of the FPOL, not 40 years from the date of issuance of the LPOL. That regulation states that "[e]ach license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from the date of issuance." It does not differentiate between LPOLs and FPOLs. Additionally, the licensee stated that the 28.5-month period between issuance of the LPOL and the FPOL was unique and the low-power license period was not intended to be part of the licensed 40-year life of the facility. Rather, this period was intended to confirm design adequacy in an operational setting. After confirming design criteria, the 40-year license period was to begin with full-power licensing and operation.

Licenses have been issued under two separate sections of the Atomic Energy Act of 1954, as amended (AEA): a commercial license under Section 103 and a research and development license under Section 104b. Prior to the 1970 amendments to the AEA, a Section 103 license required a finding of "practical value." The Atomic Energy Commission (AEC) would have based a finding of "practical value" for a type of reactor on a reliable estimate of its economics, based upon a demonstration of the technology and plant performance. In addition, after an AEC finding of "practical value" for a particular type of reactor, licenses issued under Section 103 were subject to a prelicensing review to determine if the proposed license would tend to create or maintain a situation inconsistent with antitrust laws. At that time, the AEC did not believe that it had sufficient information to make the "practical value" finding and all licenses were issued under Section 104b. In 1970, the AEA was amended to abolish the requirement of a finding of practical value and stated that any license issued for a utilization or a production facility for industrial or commercial purposes must be issued under Section 103. Note, however, that the operating license for a facility whose construction permit had previously been issued under Section 104b would likewise be issued under Section 104b, as stated in Section 102b of the AEA. The AEA does not specifically identify a license term for Section 104b licenses, although the AEA does restrict Section 103 licenses to 40 years. Section 50.51 does not distinguish between licenses issued under Sections 103 and 104b.

The Commission's practice with respect to issuance of operating licenses has varied. At one time, the staff issued provisional operating licenses (under Section 104b), followed by a full-term operating license. In addition, the staff, in some cases, issued an LPOL which was amended to allow full-power operation. The current practice is to issue an LPOL followed by a separate FPOL.

Over the years, the date from which the 40-year license term began has also varied. Originally, the forty year term began with issuance of the construction permit. Most plants in such circumstances have requested and been authorized to recapture the construction period in their operating licenses. Today, the majority of 40-year license terms begin with issuance of the LPOL. For some plants, however, the 40-year license term begins from the date of issuance of the FPOL. In most cases where the 40-year term begins with the LPOL, the time period between issuance of the LPOL and the FPOL is relatively short (several months); therefore, applying the 40-year license term to the FPOL date versus the LPOL date usually has limited benefit.

DISCUSSION:

Grand Gulf

The staff has reviewed the GGNS request and identified a number of issues associated with the proposed recapture. These issues are discussed in more detail below.

First, it appears that extending the expiration date for GGNS is not inconsistent with the regulations. GGNS was issued a separate FPOL, and the request for the license term of 40 years from the FPOL does not contravene 10 CFR 50.51.

Second, the licensee's technical position for the recapture is based on the interpretation that a 40-year service life was considered during the design and construction of the plant. The licensee believes that the original intent of the regulations was to treat the operating license term independently of the startup testing period. Surveillance, inspection, and maintenance practices are implemented in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Quality Assurance Program, and Technical Specifications and ensure that any degradation in plant safety equipment will be identified and corrected to provide safe operation of the plant for the proposed recapture period. Although there is no regulatory guidance for review of this type of recapture, the staff performed its review on the basis of the effects of aging of safety-related and other structures and components, relative to the licensing basis. The review specifically focused on the adverse effects of aging to ensure that important systems, structures, and components will continue to perform their intended functions during the requested period of recapture. The staff reviewed the effect of the recapture period on the reactor pressure vessel, structures, mechanical equipment, electrical equipment, and quality assurance and maintenance programs, and addressed outstanding safety issues. The staff concluded that no safety issues existed that would preclude an additional 28.5 months of operation. The staff's draft safety evaluation is attached.

Policy Implications of Granting Recapture

Although the GGNS amendment request is legal and technically acceptable, there are policy issues and implications associated with granting the amendment. The staff wants to make the Commission aware of these issues before it acts on the amendment.

First, a number of licensees, such as GGNS, received separate low-power and full-power licenses. As stated previously, a subset of these licensees already have a 40-year term beginning from the date of the FPOL. The GGNS amendment would be consistent with those licenses. Those licensees that were issued separate LPOLs and FPOLs with the 40-year license term beginning with the LPOL date would be eligible to recapture the time at low power without needing an exemption from 10 CFR 50.51 or applying for license renewal under 10 CFR Part 54. Granting the GGNS amendment would set a precedent for granting recaptures for those eligible plants. Although a number of plants would be eligible to apply for recapture, it would probably be advantageous for only a small number of licensees because of the variation in duration between issuance of the LPOL and the FPOL and fuel cycle length. However, a number of licensees were not issued a separate FPOL and have a 40-year license term dating from the issuance of the LPOL. If these licensees hold Section 104b licenses, they would be able to recapture the time spent at low power with an exemption to 10 CFR 50.51 or by applying for license renewal. A holder of a Section 103 license under such circumstances would be limited to applying for license renewal to recapture time spent at low-power testing due to the 40-year limit in the AEA. This would in essence, be treating some licensees differently than others merely because of differences in agency practice in issuing licenses. However, some licensees have been granted 40 years from the issuance of the FPOL and not granting the amendment to Grand Gulf would be treating Grand Gulf differently from these licensees; although Grand Gulf would be the first plant that the 40 years from FPOL was not granted with the issuance of the FPOL. As a matter of policy, a Commission decision is needed on whether to allow a certain group of licensees i.e., those issued a separate FPOL, the opportunity to recapture low-power testing time via the license amendment process when that opportunity does not exist for another group i.e., those not issued a separate FPOL.

Second, each recapture technical review would have to be customized to some extent to address the variable lengths of proposed recaptures and the level of detail of aging programs.

Other Types of Recapture

Two Section 104b licensees, GPU Nuclear and Tennessee Valley Authority, have expressed interest in recapturing time spent in long shutdowns for the Three Mile Island (TMI) Unit 1 plant and the Browns Ferry Unit 3 plant, respectively. These cases are distinctly different from the Grand Gulf case in that Grand Gulf is specifically requesting a 40-year license term beginning with the date of FPOL. Browns Ferry 3 and TMI's recapture of time spent in long shutdowns, however, could result in the duration of those licenses extending beyond 40 years from the date of the FPOL. In the TMI and Browns Ferry cases, the Commission would be extending the 40-year license as a result of long shutdown conditions. An exemption from 10 CFR 50.51 would be needed. Should Section 103 licensees seek a similar shutdown recapture, they would be precluded from seeking such extensions by statute.

The Commission has generally expressed the view, in the context of license renewal under Part 54, that Section 103 and 104 licensees should be treated similarly. Therefore, the Commission concluded that extended operation of nuclear power plants under renewed licenses, which cannot be accomplished by amendment for Section 103 licensees in accordance with the Act, should also not be accomplished by amendment for plants licensed under Section 104b. Even though the Commission is not precluded from granting amendments for the recapture of shutdown time requested by licensees of plants licensed under Section 104b such as Browns Ferry and TMI, the Commission, as a matter of policy, may wish to treat such licensees similarly to Section 103 licensees in similar circumstances and require that such types of "recapture" be accomplished under Part 54. Other factors associated with shutdown recaptures include whether to allow recapture of voluntary or involuntary shutdown time, unplanned shutdown time resulting from equipment or regulatory concerns, time spent in a shutdown condition because of NRC orders, or planned shutdown time caused by refueling outages or other maintenance outages. The duration of the shutdown would also have to be considered. The staff notes that arguments could be made to recapture shutdown time of any duration, planned or unplanned. The staff does not recommend granting these types of requests, other than through the established license renewal program specified in 10 CFR Part 54.

Although most licensees whose 40-year license term began with issuance of the construction permit have been granted construction period recapture, the staff recommends this practice continue consistent with past Commission policy.

Conclusion

In summary, the issue of whether to allow a licensee to recover (recapture) time spent in an extended low-power testing condition before receiving a full-power operating license is a policy matter. Because of past licensing practices, only licensees in similar circumstances to those of GGNS would be eligible to benefit from a policy that allows a licensee to recover time spent in low-power testing prior to receiving a full-power license. It is unclear how many of these licensees would view such an action as beneficial for the specific length of time spent in low-power operation. A policy issue exists on whether to allow a certain group of licensees the ability to recapture low-power testing time via the license amendment process when that opportunity does not exist for another group. In the Grand Gulf case, recovering the low-power testing period does not contravene the regulations, the evaluation is technically acceptable, and because of the long period of time between the LPOL and FPOL, GGNS has determined that recovering the time spent in low-power testing to be beneficial. Therefore, unless otherwise directed, the staff will issue the GGNS amendment. The Commission should note that by granting the GGNS amendment, a precedent would be set for the staff to grant other recaptures for similarly eligible plants if requested.

A policy issue also exists on whether to allow licensees to recover time spent in a shutdown condition, such as TMI and Browns Ferry. These cases are distinctly different than the GGNS case. Only 104b licensees would be eligible to request recovery of this time via an exemption from 10 CFR 50.51 i.e., without applying for license renewal under Part 54. The staff notes that should these types of requests for recovering time spent in shutdown conditions be granted, arguments could be made to recover time spent in a planned or unplanned shutdown of any duration. It is unclear how many licensees would view this type of action as beneficial. A policy issue exists whether the duration of licenses should be extended via the exemption process for 104b licensees, while this cannot be done for 103 licensees. In the context of license renewal under 10 CFR Part 54, the Commission has expressed the view that 103 and 104b licensees be treated similarly even though a 104b licensee is not precluded from requesting a license amendment that would recover extended shutdown time. The staff recommends not granting these types of requests and requiring these types of recaptures be accomplished under Part 54.

The Commission has established a policy of granting licensee requests to recover time spent in construction in cases where the 40-year license term began with the construction date. The staff recommends continuing this policy.

RESOURCES:

Plant-specific recapture requests will be assigned priorities and reviewed as part of the existing licensing activities of the Office of Nuclear Reactor Regulation.

COORDINATION:

Input to this paper was provided by the Office of the General Counsel (OGC). Additionally, OGC has reviewed this paper and has no legal objection to its contents.

The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and has no objections.

RECOMMENDATION:

The policy issues and staff recommendations are as follows:

1. Grant the Grand Gulf license amendment request to amend the expiration date of the license to recover the time spent in an extended low-power testing condition before receiving the FPOL. Grant similar requests from other licensees provided the 40-year license term began with the LPOL and a separate FPOL was issued.

2. Continue to grant licensee requests to amend the expiration date of the license to recover time spent in construction in cases where the 40-year license term began with the construction date.

3. Deny granting license amendment requests to amend the expiration date of the license to recover time spent in a shutdown condition.

William D. Travers
Executive Director for Operations

CONTACT: Claudia M. Craig, NRR
301-415-1053

Attachment: Draft GGNS Safety Evaluation

ATTACHMENT

DRAFT

Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: ISSUANCE OF AMENDMENT NO. TO FACILITY OPERATING LICENSE NO. NPF-29 - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M92993)

Dear Mr. Hagan:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. This amendment is in response to your application dated July 21, 1995.

The amendment extends the expiration date of the operating license from June 16, 2022, to November 1, 2024. The extended date is 40 years from when the full power license was issued on November 1, 1984, in accordance with Section 103.c of the Atomic Energy Act of 1954, and 10 CFR 50.51, 50.56, and 50.57.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice. The enclosed evaluation would not be sufficient for a request for license renewal under 10 CFR Part 54.

Sincerely,
Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:
1. Amendment No. to NPF-29
2. Safety Evaluation

cc w/encls: See next page

ENTERGY OPERATIONS, INC.
SYSTEM ENERGY RESOURCES, INC.
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
ENTERGY MISSISSIPPI, INC.
DOCKET NO. 50-416
GRAND GULF NUCLEAR STATION, UNIT 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.
License No. NPF-29

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Entergy Operations, Inc. (the licensee) dated July 21, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended, as indicated in the attachment to this license amendment, by amending paragraph 2. H. of Facility Operating License No. NPF-29 to read as follows:

H. This license is effective as of the date of issuance and shall expire on November 1, 2024.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION
Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Page 17 of the License

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT
AMENDMENT NO. FACILITY OPERATING LICENSE NO. NPF-29
DOCKET NO. 50-416

Revise the above license by removing the page identified below and inserting the enclosed page. The revised page is identified by amendment number and contains a vertical line indicating the area of change.

REMOVE PAGE	INSERT PAGE
17 of license	17 of license

DRAFT

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. TO FACILITY OPERATING LICENSE NO. NPF-29
ENTERGY OPERATIONS, INC., ET AL.
GRAND GULF NUCLEAR STATION, UNIT 1
DOCKET NO. 50-416

1.0 INTRODUCTION

By letter dated July 21, 1995, Entergy Operations, Inc. (the licensee) submitted a request for changes to the operating license for Grand Gulf Nuclear Station, Unit 1 (GGNS). The amendment would extend the expiration date of the operating license from June 16, 2022, to November 1, 2024. The extended date for termination of the operating license would be 40 years after issuance of the full-power license, NPF-29, issued on November 1, 1984. This proposed amendment is not a request for license renewal under 10 CFR Part 54.

2.0 BACKGROUND

Section 103.c of the Atomic Energy Act of 1954, as amended, provides that a license is to be issued for a specific period not to exceed 40 years. The Code of Federal Regulations (CFR) in 10 CFR 50.51 also specifies that each license will be issued for fixed period of time not to exceed 40 years from the date of issuance. Also, 10 CFR 50.56 and 50.57 allow the issuance of an operating license pursuant to 10 CFR 50.51 after the construction of the facility

has been substantially completed, in conformity with the construction permit and when other provisions specified in 10 CFR 50.57 are met.

The current licensed term for GGNS ends on June 16, 2022. This is 40 years from the date of the low-power license, which was issued on June 16, 1982. In the low-power license, the licensee was only authorized to operate the plant up to 5 percent of rated power or 191 megawatts thermal.

On August 31, 1984, the Commission amended the low-power license to allow the licensee to operate up to 100 percent rated power or 3833 megawatts thermal. However, in response to a court challenge to the amendment, the Commission issued CLI-84-19 on October 25, 1984, directing the Staff to issue a separate full power license to Grand Gulf. On November 1, 1984, a full power license was issued to Grand Gulf whose expiration date was 40 years from the date of issuance of the low power license. In the full-power license, the licensee was authorized to operate up to 100 percent of rated power.

The licensee requests an extension to the full-power operating license so that the licensed term will expire on November 1, 2024, or 40 years from the date of issuance of the full-power operating license on November 1, 1984. In the full-power license, the licensee was authorized to operate the plant up to 100 percent rated power or 3833 megawatts thermal.

In its application, the licensee stated that GGNS is fairly unique among licensed commercial nuclear power facilities in having an extended period of low-power operation. The period from the date of issuance of the low-power license to the full-power license is approximately 2.5 years. The licensee proposed to recapture this period of low-power operation by having the 40-year operating license term extended from June 16, 2022 to November 1, 2024. The licensee stated that, for GGNS, the additional license period would allow for at least one additional cycle of operation and perhaps two cycles and, therefore, the economic value of the license extension would be substantial.

The licensee's request for an extension of the operating license is based on the fact that a 40-year service life was considered during the design and construction of the plant. Although this does not mean that some components will not wear out during the plant's lifetime, design features were incorporated which provide for inspectability of structures, systems, and components during this lifetime. Surveillance, inspectability, and maintenance practices which were implemented in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) for inservice inspection and testing of pumps and valves and the plant Technical Specifications (TSs) provide assurance that any degradation in plant safety equipment will be identified and corrected to provide safe operation of the plant for the proposed license extension period. The specific provisions and requirements for ASME Code testing are set forth in 10 CFR 50.55a.

3.0 EVALUATION

The staff has evaluated the environmental and safety issues associated with the proposed amendment which would allow approximately 2.5 years of additional plant operation. The major safety issue is the effects of aging and neutron fluence on plant structures and equipment. This is addressed in Section 3.2.

The staff reviewed the licensee's application, the licensee's Updated Final Safety Analysis Report (UFSAR) for GGNS, the GGNS TSs, and the Safety Evaluation Report (SER, NUREG-0831 and its seven supplements) and Final Environmental Statement (FES, NUREG-0777) related to the operation of Grand Gulf Nuclear Station, Units 1 and 2, which documented the staff's review prior to issuance of a license to GGNS. The two NUREGs were issued in September 1981. The supplements to NUREG-0831 were issued at later dates as identified in the evaluation below.

Unit 2 is not involved with this amendment because it was abandoned in September 1985 and never constructed. The construction permit for Unit 2 was revoked by the Nuclear Regulatory Commission (NRC) Order dated August 7, 1991.

3.1 Environmental Assessment

The environmental assessment for the proposed amendment was addressed by the staff in the Notice of Issuance of Environmental Assessment and Finding of No Significant Impact in the Federal Register (62 FR 19144) on April 18, 1997. The conclusion of the staff was that the proposed amendment would result in no significant differences from the environment impacts that were reported in the FES dated September 1981 issued prior to the issuance of the licenses for GGNS on June 16, 1982 (low-power license), and November 1, 1984 (full-power license).

3.2 Safety Assessment

3.2.1 NEUTRON DAMAGE OF THE REACTOR PRESSURE VESSEL

The reactor pressure vessel was designed and fabricated in accordance with the requirements of Section III, Class 1, of the ASME Code edition, addenda, and Code Cases applicable at the time of design and construction. Operating limitations of the ASME Code and of Appendix G, "Fracture Toughness Requirements," of 10 CFR Part 50 are also applicable. The reactor pressure vessel (RPV) and the reactor coolant system were designed to allow inspections in accordance with Section XI of the ASME Code. The staff's evaluation approving the programs and their implementation with respect to these structures are contained in NUREG-0831 and its seven supplements. Industry experience with steel structures confirms a service life in excess of 40 years may be anticipated.

Over the operating life of a reactor vessel, ferritic materials exposed to neutron irradiation will undergo changes in material properties and a decrease in fracture toughness. The decrease in fracture toughness is of particular importance because the ability to resist failure caused by the propagation of a crack decreases with increasing irradiation. The fracture toughness of the vessel is monitored by a surveillance program in accordance with the requirements of Appendix H, "Reactor Vessel Materials Surveillance Program Requirements," of 10 CFR Part 50. The purpose of the materials surveillance program is to help ensure vessel integrity by monitoring changes in the fracture toughness properties of the reactor vessel beltline materials. The ferritic materials must meet the fracture toughness properties of Section III of the ASME Code and Appendix G to 10 CFR Part 50. This surveillance program will aid in adjusting the operational conditions in order to maintain sufficient safety margin for the prevention of brittle failure of the reactor vessel.

The reactor vessel is discussed in Section 5.3 of the UFSAR. In that section, the following are discussed:

- The vessel is designed, fabricated, tested, inspected, and stamped in accordance with the ASME Code, Section III, Class 1 including the addenda in effect at the date of the order of the vessel, Winter 1972 and meets Seismic Category I.

- Shifts in transition temperature caused by irradiation during the vessel life can be accommodated by raising the minimum pressurization temperature, and the predicted value of adjusted reference temperature does not exceed 200 degrees F.

- Compliance with Appendices G and H of 10 CFR Part 50.

The reactor vessel was also designed to withstand a variety of transient and cyclic loads which occur throughout the operational life of the plant. Table 3.9-35 of UFSAR provides the cyclic or transient limits for the vessel.

To date one material specimen capsule has been removed from the reactor vessel; however, by letters dated May 2 and 31, 1996, the licensee requested that it be placed back in the vessel because testing of the first capsule at 8 effective full power years (EFPY) may not be useful. The low neutron fluence and good material chemistry for the vessel will result in a minimal shift in the material properties of the specimen in the capsule. A revision to the capsule withdrawal schedule and placing the first capsule back in the vessel was approved by the staff in its letter of August 27, 1996.

On May 19, 1995, the NRC issued Generic Letter (GL) 92-01, Revision 1, Supplement 1, "Reactor Vessel Structural Integrity." In this GL, the NRC requested that licensees perform a review of their reactor vessel structural integrity analyses in order to identify, collect, and report any new data pertinent to the analysis of the vessel structural integrity and to assess the impact of that data on the analysis relative to the requirements of 10 CFR 50.60 (Acceptance criteria for fracture prevention measures for normal operation) and 50.61 (Fracture toughness requirements for protection against pressurized thermal shock), and Appendices G and H. The licensee responded in its letters of August 14 and November 20, 1995, and indicated that it has performed additional reviews and the structural integrity analyses remain valid; however, the licensee also stated that there is an industry initiative to ensure all sources of information pertinent to the reactor vessel are considered in the structural integrity analyses. In its letter of August 22, 1996, the staff concluded that the licensee had completed all of the actions in GL 92-01 and requested that the licensee provide NRC with results of this industry initiative for GGNS within 120 days of receipt of the final generic assessment.

Based on the above, there is reasonable assurance that the RPV will, for the proposed license term extension requested by the licensee, be in conformity with the applicable provisions of the rules and regulations of the Commission, and the GGNS license.

3.2.2 STRUCTURES

The concrete and steel Category I structures at GGNS were designed and constructed in accordance with the General Design Criteria of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50. This is discussed in Sections 3.1 and 3.2 of the UFSAR. The licensee's design basis, fabrication, construction, and implementation of quality assurance criteria for the plant were reviewed by the staff when the plant was being licensed for low-power operation. The staff's evaluation approving the programs and their implementation with respect to these structures are contained in NUREG-0831 and its seven supplements. Industrial experience with concrete and steel structures confirms a service life in excess of 40 years may be anticipated.

The major codes and specifications used in the design and construction of the Category I concrete and steel structures were, respectively, American Concrete Institute (ACI) 349, "Criteria for reinforced Concrete Nuclear Power Containment Structures," and ACI 318-71, "Building Code Requirements for Reinforced Concrete," and the American Institute of Steel Construction (AISC) specification, "Specification for the Design, Fabrication, and Erection of Structural Steel for Building." The foundations of the seismic Category I structures are reinforced concrete designed to ACI 318-71. Section 3.8 of NUREG-0831 stated that the criteria that were used in the analysis, design, and construction of seismic Category I structures at GGNS account for anticipated loadings and postulated conditions that may be imposed on the structures during their service lifetime which would include the requested 2.5 years of additional power operation. These criteria are in conformance with the established criteria, codes, standards, and specifications acceptable to the staff.

The licensee's use of the indicated codes, standards, and specifications in the plant's design, analyses, and construction and the licensee's quality assurance program required by Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, as approved by NUREG-0831 and its supplements, provide reasonable assurance that the concrete and steel structures will, for the proposed license term extension requested by the licensee, be in conformity with the applicable provisions of the rules and regulations of the Commission, and the GGNS license.

3.2.3 MECHANICAL EQUIPMENT

Surveillance, maintenance, and testing requirements for mechanical equipment are in place at the plant to verify operability or to detect degradation and ensure that the equipment that does degrade is replaced or other corrective actions are taken. In addition, subcomponents such as nonmetallics (e.g., gaskets and o-rings) are inspected and replaced as necessary, as part of routine maintenance in order to ensure the design life of equipment. Surveillance, inspection, and testing requirements at GGNS, which will apply during the operating life of the plant, include the following:

- ASME Code Section XI: Equipment that is safety-related is ASME Code Class 1, 2, or 3 and is subject to the inservice inspection and testing requirements of Section XI and 10 CFR 50.55a, except where relief has been granted in writing from these requirements. These requirements apply throughout the operating life of a plant and will provide reasonable assurance that mechanical components will be properly monitored throughout the plant lifetime.

- Technical Specifications (TSs): 10 CFR 50.36 requires the establishment of limiting conditions for operation (LCOs) for certain equipment. (LCOs

are the lowest functional capability or performance levels of equipment required for safe operation of the facility). This equipment is subject to the surveillance and testing requirements in the TSs to assure systems are operable. These surveillance requirements include calibration and inspection of systems and components to ensure that operation of the plant will remain in accordance with the limiting conditions for operation.

- 10 CFR Part 50, Appendix J: Equipment and components associated with containment penetrations, including containment isolation valves, are subject to the leak testing requirements in Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." This is for Type B and C testing of valves and penetrations, and Type A testing of the overall containment structure.

The licensee has implemented procedures for maintaining the operability of the mechanical components and, thus, the mechanical equipment the components are a part of. Examples of the procedures are the following: 01-S-07-27 (Rev. 10, dated 8/26/92) Lubricating Oil Sample Program, 01-S-07-35 (Rev.100, 3/20/95) ASME Section XI System Pressure Test, 01-S-07-39 (Rev. 101, 2/4/97) Inservice Testing, 01-S-17-12 (Rev. 2, 3/11/96) Maintenance Monitoring Program for effectiveness of maintenance on equipment, 01-S-17-18 (Rev. 0, 4/5/90) Predictive Maintenance Program on early detection and diagnosis of equipment problems and degradation before failures, 01-S-17-20 (Rev. 3, 1/30/97) Reliability Centered Maintenance Program to enhance preventative maintenance to improve reliability, 01-S-17-21 (Rev. 1, 2/9/96) Oil/Lubricant Program, 01-S-17-43 (Rev. 0, 2/21/95) Air Operated Valves (AORs) Program for proper maintenance of AORs, 17-S-03-24 (Rev. 1, 8/6/93) Thermography Program to inspect electrical and mechanical equipment to determine if maintenance is required, 17-S-03-25 (Rev. 1, 10/13/94) and 17-S-03-27 (Rev. 0,6/17/94) Vibration Monitoring program to establish criteria and vibration limits to prevent equipment failures, 17-S-05-3 (Rev. 1, 11/14/95) Review of Pump Inservice Test Results, 17-S-05-12 (Rev. 100, 3/31/95) Snubber Service Life Program, GGNS-MS-41 (Rev. 3, 4/14/95) and GGNS-MS-46 (Rev. 1, 4/24/94) Monitoring Internal Erosion/Corrosion in High Energy and Moderate Energy Piping Components, and QAP.9.90 (Rev. 3, 2/26/97) Administration of Microbiological Induced Corrosion (MIC) Tracking in Standby Service Water Systems. The Station Information Management System (SIMS) and the repetitive task program (procedure 01-S-17-11, Rev. 2, 9/3/93) schedules the repetitive maintenance tasks, such as maintenance, inspections, testing, sampling, and surveillances to assure the tasks are completed as scheduled. This will assure that the preventative maintenance of the mechanical components is performed to ensure the operability and qualification of the mechanical equipment is maintained.

From this evaluation, the staff concludes that compliance with the codes, standards, and regulatory requirements to which mechanical equipment were analyzed, constructed, tested, and inspected provide adequate assurance that the structural integrity of equipment important to safety will be maintained during the operating lifetime of the plant and during the additional period authorized by this amendment. Any significant degradation by such equipment would be discovered and the equipment restored to an acceptable, and operable, condition.

3.2.4 ELECTRICAL EQUIPMENT

The licensee has a program in place for the environmental qualification (EQ) of electrical equipment. As noted in Appendix H of Supplement 2 (dated June 1982), and Section 3.11 of Supplements 4 (dated May 1983) and 5 (dated August 1984), to NUREG-0831, the staff approved the program and deleted the low-power license conditions related to the program.

The full-power license condition 2.C.(11) required the licensee to qualify the electrical equipment to the EQ requirements in 10 CFR 50.49 by March 31, 1985. By letter dated March 7, 1985, the licensee requested an extension to no later than November 30, 1985 (as was allowed by 50.49) to have all electrical equipment important to safety qualified and in compliance with 10 CFR 50.49, and the staff granted the extension in its letter of March 27, 1985. The NRC Inspection Report 50-416/87-32, of March 25, 1988, documented that the licensee had met 10 CFR 50.49. Although there were 4 deficiencies in the EQ program, the staff concluded that within the scope of the inspection, the program met the requirements of 10 CFR 50.49.

The EQ program at GGNS includes qualification of the electrical equipment through accelerated aging tests. In accordance with 10 CFR 50.49, the program is required during the entire period of the operating license, which will include the term of the proposed license extension requested by the licensee, with approval of this amendment. The program will continue to ensure electrical equipment important to safety will not be used beyond its qualified life. To determine whether the program can and will perform this function, the following GGNS procedures which govern the environmental equipment qualification program were reviewed: (1) Standard ES-19 (Revision 9, September 9, 1996) Engineering Standard for Environmental Equipment Qualification Maintenance," (2) 07-S-01-227 (Revision 6, dated February 19, 1997) "Maintenance Procedure Equipment Qualification Program Safety Related," and (3) Standard ES-21 (Revision 1, May 5, 1988) "Engineering Standard Environmental Qualification Program Safety-Related." The safety information management system (SIMS) provides a computerized method of ensuring that the requirements of maintaining qualification of safety-related equipment are tracked and met. The maintenance activities for each component which are required to maintain qualification of that component are shown in and scheduled through the SIMS database.

Although the plant's original life was considered to be 40 years, the EQ program will account for operation during the term of the proposed extension requested by the licensee. If a component has a qualified life of less than 40 years, its replacement is scheduled through the maintenance program and the SIMS database. Similarly, if the component has a 40-year qualified life, the replacement of the component is also scheduled through the maintenance program and the SIMS database. Therefore, the EQ program will support the proposed amendment.

3.2.5 QUALITY ASSURANCE AND MAINTENANCE PROGRAMS

In licensing GGNS, the staff reviewed the quality assurance (QA) program and the conduct of operations, including the maintenance procedures, at GGNS. The QA program for the plant operations will assess how the plant organization is following procedures and meeting requirements for plant operation. This would include the maintenance program at the plant which assures the equipment is operable. In NUREG-0813, the staff concluded that the QA program and maintenance procedures were acceptable.

Inspections by the staff of the QA and maintenance programs at GGNS show that these programs remain acceptable, although corrections in the programs have been identified. The QA program meets the requirements of Appendix B to 10 CFR Part 50.

Therefore, the licensee's implementation and use of these programs at GGNS provides reasonable assurance that equipment important to safety will, for

the proposed license term extension requested by the licensee, be in conformity with the applicable provisions of the rules and regulations of the Commission, and the GGNS license.

3.2.6 STATUS OF OUTSTANDING ISSUES, CONFIRMATORY ISSUES, AND LICENSE
Conditions

At the time the plant was licensed, there were outstanding issues, confirmatory issues, and license conditions discussed in Sections 1.09, 1.10, and 1.11, respectively, of NUREG-0831 and its seven supplements. These issues and license conditions were either resolved prior to issuance of the full-power license or made license conditions. The proposed amendment has no effect on the license conditions in the full-power license.

3.3 Conclusion

Based on the discussion above, on the safety and environmental issues involved with granting an extension to the operating license, there are no safety issues that would preclude an additional 2.5-year period of operation, from June 16, 2022, to November 1, 2024, extending the term of the license. Based on this, the staff concludes that the proposed amendment is acceptable; however, it should be noted that the above evaluation would not be sufficient for license renewal under 10 CFR Part 54.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact has been prepared for the proposed amendment and published in the Federal Register on April 18, 1997, (62 FR 19144). Accordingly, based upon the environmental assessment, the staff has determined that the issuance of the amendment will not have a significant effect on the quality of the human environment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Jack Donohew

Date: