November 7, 1990

Docket No. 50-416

Mr. William T. Cottle
Vice President, Operations GGNS
Entergy Operations, Inc.
Post Office Box 756
Port Gibson, Mississippi 39150

Dear Mr. Cottle:

SUBJECT: ISSUANCE OF AMENDMENT NO. 72 TO FACILITY OPERATING LICENSE NO. NPF-29 - GRAND GULF NUCLEAR STATION, UNIT 1, REGARDING POST ACCIDENT NEUTRON MONITOR (TAC NO. 76092)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 72 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. This amendment consists of a change to Attachment 1 to the Operating License in response to your application dated February 16, 1990, as revised May 31 and June 22, 1990.

The amendment extends the date for installing a neutron flux monitor for improved accident monitoring from the fourth refueling outage (October 1990) to the fifth refueling outage (April 1992).

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.

Sincerely,

ORIGINAL SIGNED BY:

Lester L. Kintner, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 72 to NPF-29
2. Safety Evaluation

cc w/enclosures:
See next page

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*See previous concurrence

OFC	PD4-1/LA	PD4-1/PM	*SICB/BC	OGC	PD4-1/D(A)		
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DATE	10/24/90	10/24/90	10/24/90	10/25/90	11/7/90		

OFFICIAL RECORD COPY Document Name: GRAND GULF AMENDMENT TAC 76092

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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L L Kintner

Lester L. Kintner, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III,
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Office of Nuclear Reactor Regulation

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2. Safety Evaluation

cc w/enclosures:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENTERGY OPERATIONS, INC.

SYSTEM ENERGY RESOURCES, INC.

SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION

MISSISSIPPI POWER AND LIGHT COMPANY

DOCKET NO. 50-416

GRAND GULF NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 72
License No. NPF-29

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

   A. The application for amendment by the licensee dated February 16, 1990 as revised May 31, 1990, and June 22, 1990, 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 by changes to the Operating License, as indicated in the attachment to this license amendment.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R. Quay

Theodore R. Quay, Director
Project Directorate IV-1
Division of Reactor Projects - III
IV, V, and Special Projects
Office of Nuclear Reactor Regulation

Attachment:
Change to the Operating License

Date of Issuance: November 7, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 72

FACILITY OPERATING LICENSE NO. NPF-29

DOCKET NO. 50-416

Replace the following page of Attachement 1 to the Operating License with the attached page. The revised page is identified by amendment number and contains vertical lines indicating the area of change.

REMOVE PAGE	INSERT PAGE
18	18

NOVEMBER 1, 1984

Attachment 1

SERI shall complete the following requirements on the schedule noted below:

Emergency Response Facilities (Generic Letter 82-33, NUREG-0737 Supplement 1, SSER #5)

SERI shall implement the specific items below, in the manner described in MP&L letter (AECM-83/0232) dated April 15, 1983, as modified in MP&L letter (AECM-83/0486) dated August 22, 1983, no later than the following specified dates:

(a)	Safety Parameter Display System (SPDS)	
	(1) Submit a safety analysis and implementation plan to the NRC	July 1985
	(2) SPDS fully operational and operator trained	Prior to startup following first refueling outage.
(b)	Detailed Control Room Design Review (DCRDR)	
	(1) Submit a program plan to the NRC	December 1984
	(2) Submit a summary report to the NRC including a proposed schedule for implementation	July 1986
(c)	Regulatory Guide 1.97 - Application to Emergency Response Facilities	
	(1) Submit a report to the NRC describing how the requirements of Supplement 1 to NUREG-0737 have been or will be met.	February 1985
	(2) Implement (installation or upgrade) requirements of R.G. 1.97 with exception of flux monitoring and coolant level monitoring.	Prior to startup following first refueling outage.
	(3) Implement (installation or upgrade) requirements of R.G. 1.97 for coolant level monitoring.	Prior to startup following second refueling outage.
	(4) Implement (installation or upgrade) requirements of R.G. 1.97 for flux monitoring.	Prior to startup following fifth refueling outage
(d)	Upgrade Emergency Operating Procedures (EOP's)	
	(1) Submit a Procedures Generation Package to the NRC.	April 1985

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 72 TO FACILITY OPERATING LICENSE NO. NPF-29

ENTERGY OPERATIONS, INC.

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

1.0 INTRODUCTION

By letter dated February 16, 1990, as revised May 31 and June 22, 1990, the licensee (System Energy Resources, Inc., before June 6, 1990, and Entergy Operations, Inc., on or after June 6, 1990), requested an amendment to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. License Condition 2.C.(36), of Operating Licensee No. NPF-29, requires that prior to startup from the fourth refueling outage, the licensee shall implement the requirements of Regulatory Guide (R.G.) 1.97 for neutron flux monitoring by installation of an additional flux monitor or by upgrading the existing flux monitoring system. The proposed amendment would modify License Condition 2.C.(36) to delay the implementation of neutron flux monitoring system installation or modifications from prior to startup following the fourth refueling outage to prior to startup following the fifth refueling outage.

On January 12, 1987, the staff issued a safety evaluation regarding the licensee's conformance to R.G. 1.97. This safety evaluation concluded that the Grand Gulf Nuclear Station design was acceptable with respect to the provisions of R.G. 1.97, Revision 2, except for instrumentation associated with the neutron flux variable. The staff found that the existing neutron flux instrumentation was acceptable for interim operation; however, the safety evaluation concluded that prior to startup from the second refueling outage, the licensee must install or upgrade the neutron flux instrumentation to conform to R.G. 1.97, Revision 2.

By letter dated July 1, 1987, the licensee requested that the implementation date for the installation or upgrade of the neutron flux instrumentation be changed from prior to the startup following the second refueling outage to prior to startup following the third refueling outage. The licensee stated that they followed the industry development of neutron flux instrumentation that meets R.G. 1.97 criteria and that the scheduling, procurement, and installation of a system meeting R.G. 1.97 would not be possible during the second refueling outage. On December 2, 1987, the staff approved the requested schedule change in Amendment No. 37 to the license.

By letter dated July 1, 1988, the licensee requested that the implementation date for the installation or upgrade of the neutron flux instrumentation be deferred until startup following the fourth refueling outage. The basis for this request was that the Boiling Water Reactor Owners Group (BWROG) had submitted licensing topical report (LTR) NEDO-31558, which concluded that the present BWR neutron flux monitors for normal operation are also adequate for post-accident monitoring, although they deviate from the criteria of R.G. 1.97. The NRC staff approved the requested change in the implementation schedule by Amendment No. 37 to the license, dated December 6, 1988, based on the licensee's commitment to install the instrumentation in the fourth refueling outage if the NRC staff did not accept the BWROG LTR, and to provide quarterly progress reports on the design and procurement specifications of the instrumentation.

By letter dated January 29, 1990, the NRC staff provided to the BWROG its Safety Evaluation of the BWROG LTR NEDO-31558 in which the staff concluded that the proposed deviation from the Category 1 Criteria of R.G. 1.97 for post-accident neutron flux monitoring instrumentation is unacceptable and that BWR licensees should install instrumentation that fully complies with the Category 1 Criteria of R.G. 1.97.

At that time, the licensee had designed excore neutron flux instrumentation but expected it would not fully meet R.G. 1.97 Criteria, particularly in environmental qualification and the low end of the instrumentation range (10E-6% power). The BWROG met with the staff to further discuss design criteria and to discuss the basis for the staff's conclusion. The present request for deferral to the fifth refueling outage is based on achieving an excore design that would meet the low end of the range.

By letter dated August 16, 1990, the BWROG appealed the NRC staff's position to the Director, Office of Nuclear Reactor Regulation (NRR), requesting reversal of the staff's conclusion that BWR licensees must install instrumentation that meets the Category 1 Criteria of R.G. 1.97. By letter dated September 13, 1990, the Director, NRR, advised BWROG that he would consider the appeal and that, as requested, licensees may defer plant specific actions to install instrumentation pending resolution of the appeal. The Director's decision on the appeal is expected to be made in November 1990.

The proposed change requested by the licensee's June 22, 1990 submittal would change the license condition to state that the licensee shall implement the installation or upgrade recommendations of R.G. 1.97 for neutron flux monitoring prior to startup following the fifth refueling outage. Since the fifth outage will begin in April 1992, there is adequate time to procure the instrumentation, should the Director, NRR, deny the appeal.

2.0 EVALUATION

The excore neutron monitoring instrumentation designed for installation in the fourth refueling outage would have detectors outside the biological shield. The licensee indicated that the low end of the instrumentation range for sensors, mounted external to the biological shield, was expected to be in the range of 10E-4 to 10E-5% power. Deferral of the installation until the fifth refueling outage will allow the design of detector locations to increase the low end of the range to 10E-6% power. The licensee is currently working with a vendor of excore detectors on a design which is expected to result in this sensitivity. This design will use a detector placed in a hole in the biological shield so that the end is near the inner steel liner. This design will use a smaller detector than the one previously designed for location outside the biological shield.

The post-accident neutron monitoring system proposed for installation in the fourth refueling outage is expected to be within two decades of meeting the R.G. 1.97 low end range of 10E-6% power. The intent of the post-accident neutron monitoring system is to provide warning of returning the reactor to a critical state. Under anticipated design basis events, once all rods have been inserted, return to a critical state would not be expected. However, under hypothetical events where certain rods would drift out or where fuel would undergo some physical changes, the proposed system would provide 6 decades (10E-4% to 100% power) of power status information to the operator. However, deferring installation of the proposed system one fuel cycle to allow for additional design at a better detector location will provide a post-accident monitoring system that will have a greater operating range (8 decades) for detecting approach to criticality. This earlier warning of approach to criticality would allow more time for operators to initiate mitigative actions.

The current margin of safety is established by the existing operational neutron monitoring system and the shutdown margin of the control rod system. The post-accident neutron monitoring system required by R.G. 1.97 provides additional information to the operator for responding to undefined post-accident reactivity anomalies. The excore neutron monitoring system originally proposed for installation during the fourth refueling outage would provide neutron monitoring diversity and qualified instrumentation to approximately 10E-4% power. Deferral of this system for one additional fuel cycle to allow for further review of system design criteria and alternate detector locations for improving low end range sensitivity to 10E-6% power will reduce the post-accident neutron monitoring margin of safety during fuel Cycle 5 operations. However, the margin of safety for a post-accident monitoring system having potentially 8 decades of operating range for the remainder of the GGNS plant operating life (about 30 years), would provide an overall long-term net improvement in post-accident neutron monitoring capability. Therefore, the deferral of the installation for one fuel cycle (1½ years) when viewed over the complete operating life of the plant, would result in a net increase in the margin of safety.

The licensee has committed to install an incore neutron monitoring system that meets the recommendations of R.G. 1.97. The licensee has also agreed to provide the staff with quarterly updates of the progress of procurement, design, and installation of a qualified system. Until the post-accident qualified neutron flux monitoring system is installed and operational, the licensee would use the presently installed neutron flux monitoring system and other post-accident qualified instrumentation. The presently installed system is expected to function during the initial phase of an accident (including a LOCA) to indicate subcritical reactor power. Long term monitoring is available through the APRM channels where operator action is required at the APRM down scale alarm. However, since the presently installed system is not fully qualified to R.G. 1.97, Category 1 requirements, long-term monitoring in a harsh environment may not be directly available over the entire R.G. 1.97 range. In this event, other measures and indications are available to the operator, as discussed below:

(a) The present control rod position indication system provides the reactor operator with the information that all rods are inserted.

(b) Qualified instrumentation, such as reactor pressure, suppression pool temperature and safety relief valve (SRV) actuation, provides the reactor operator with post-accident information of assessment of reactor power if direct neutron monitoring capability is not available.

(c) The Emergency Procedures (EP) are symptom based and provide appropriately conservative actions if reactor power can not be directly measured in a post-accident situation. The EP contain action steps that mitigate the symptomatic effects of design basis events (such as LOCA), and beyond design basis events (such as ATWS).

The compensatory measures listed above ensure that the consequences of an accident previously evaluated will not be significantly increased by the absence of a post-accident neutron flux monitoring system during the fifth fuel cycle.

Based on the licensee's commitment to install an improved neutron flux monitoring instrumentation that fully conforms to R.G. 1.97, Revision 2, by startup following the fifth refueling outage and to provide quarterly reports on the status and schedule for procurement, design, and installation of the instrumentation, the staff concludes that the proposed delay is acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and that there is no significant increase in individual or cumulative

occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration, and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that this amendment involves no significant hazards consideration, which was published in the Federal Register on July 25, 1990 (55 FR 30295), and consulted with the State of Mississippi. No public comments or requests for hearing were received, and the State of Mississppi did not have any comments.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of this amendment will not be inimical to the common defense and the security, or to the health and safety of the public.

Dated: November 7, 1990

Principal Contributors: L. Kintner
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