October 9, 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. 71 TO FACILITY OPERATING LICENSE NO. NPF-29 - GRAND GULF NUCLEAR STATION, UNIT 1, REGARDING BATTERY SURVEILLANCE TESTING (TAC NO. 77294)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 71 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. This amendment consists of changes to the Technical Specifications (TS) in response to your application dated August 10, 1990, as revised August 20, 1990.

The amendment changes the TS by adding a note to TS Table 4.8.2.1-1, "Battery Surveillance Requirements," to allow a battery charging current less than 2 amps to be used to determine battery operability when on float charge following a battery service or discharge test. The associated Bases for the TS are also changed.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's 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. 71 to NPF-29
2. Safety Evaluation

DISTRIBUTION

Docket File	NRC PDR	Local PDR	PD4-1 Reading
B. Boger	GPA/PA	T. Quay	L. Berry
L. Kintner (2)	OGC	D. Hagan	PD4-1 Plant File
G. Hill (4)	Wanda Jones	ACRS (10)	ARM/LFMB
D. Verrelli			

OFC	:PD4-1/LA	:PD4-1/PM	:OGC	:PD4-1/D(A)	:	:	:
NAME	:LBerry:	:LKintner:lh	:	:TQuay	:	:	:
DATE	:09/ /90	:09/17/90	:09/27/90	:09/ /90	:	:	:

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

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Sincerely,

L L Kintner

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:
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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. 71
License No. NPF-29

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

   A. The application for amendment by the licensee dated August 10, 1990, as revised August 20, 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 Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. NPF-29 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 71 , are hereby incorporated into this license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Theodore R Quay

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 9, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 71

FACILITY OPERATING LICENSE NO. NPF-29

DOCKET NO. 50-416

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised areas are indicated by marginal lines.

REMOVE PAGES	INSERT PAGES
3/4 8-13	3/4 8-13
B 3/4 8-2	B 3/4 8-2

TABLE 4.8.2.1-1

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A(1)	CATEGORY B(2)	
	Limits for each designated pilot cell	Limits for each connected cell	Allowable(3) value for each connected cell
Electrolyte Level	>Minimum level indication mark, and < ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	> 2.13 volts(b)	> 2.07 volts
Specific Gravity(a)	≥ 1.195(c)	≥ 1.190	Not more than .020 below the average of all connected cells
		Average of all connected cells > 1.200	Average of all connected cells ≥ 1.190(c)

(a) Corrected for electrolyte temperature and level.
(b) May be corrected for average electrolyte temperature.
(c) Or battery charging current, following a battery service or performance discharge test, is less than 2 amps when on float charge.
(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

A.C. SOURCES, D.C. SOURCES and ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The surveillance requirements for demonstrating the OPERABILITY of the unit batteries are in accordance with the recommendations of Regulatory Guide 1.129 "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.".

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8.2.1-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery. Exceptions to the specific gravity requirements are taken to allow for the normal deviations experienced after a battery discharge and subsequent recharge associated with a service or performance discharge test. The specific gravity deviations are recognized by and discussed in IEEE 450-1980.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8.2.1-1 is permitted for up to 7 days. During this 7 day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 71 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 August 10, 1990, as revised August 20, 1990, the licensee, Entergy Operations, Inc., requested an amendment to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1 (GGNS-1).

The proposed amendment would change the Technical Specifications (TS) by adding a note to TS Table 4.8.2.1-1, "Battery Surveillance Requirements," to allow a battery charging current less than 2 amps instead of specific gravity limits to be used to determine battery operability when on float charge following a battery service or performance discharge test. The associated Bases for the TS are also changed.

2.0 EVALUATION

The existing surveillance requirements in TS 4.8.2.1 require, in part, that engineered safety features (ESF) batteries be demonstrated operable by verifying that the battery electrolyte specific gravity meet the limits in Table 4.8.2.1-1 at specified test intervals. Verification that the specific gravity limits are met, must be made at least once per 7 days for Category A limits, and at least once per 92 days for Category B limits. In addition, verification must be made that Category B limits, or allowable values, are met within 7 days after the battery service discharge test, required by TS 4.8.2.1.d, and after the battery performance discharge test, required by TS 4.8.2.1.e.

Although the batteries are fully recharged after a discharge test, it takes about 7 days for the specific gravity to stabilize. Until the specific gravity limits of Table 4.8.2.1-1 are met, the batteries cannot be declared operable. The Bases for TS 3.8.2.1 recognize that a battery charging current which has stabilized at a low value is an acceptable alternative to specific gravity measurement for determining the state of charge of the battery, but an acceptable value is not specified. The licensee has proposed a change to TS Table 4.8.2.1-1 by adding a footnote to allow a charging current less than 2 amps to be used as an alternate means of verifying the operability of batteries following a battery service or performance discharge test. The footnote would be applicable to the Category A limits and the Category B allowable values. The Bases for TS 3.8.2.1 would be changed to reflect the TS change.

The staff has reviewed the proposed changes to use the battery charging current in lieu of specific gravity to verify the operability of ESF batteries following service and performance discharge tests. The specific gravity of the tested battery drops during discharge to a value approaching 1.00. On the subsequent recharge, the measured specific gravity of the cells is not immediately representative of the average specific gravity of the electrolyte in the cell. This is caused by high specific gravity sulfuric acid which sinks to the bottom of the cell resulting in an incorrect low reading at the top of the cell where a sample is taken for measurement. The high specific gravity acid gradually diffuses through the solution and it takes about a week for the acid to diffuse throughout the electrolyte. Due to the time required for the diffusion process, the specific gravity parameter measurement does not accurately reflect the battery's state of charge after recharging.

During the period following a service or performance discharge test, the battery charging current is a more accurate indicator of the battery state of charge. As the cells approach full charge, the battery voltage rises to approach the charger output voltage, and the charging current decreases to a stabilized value. When the charging current has stabilized at the charging voltage, the battery is charged, even though the specific gravity has not stabilized. A charging current less than 2 amperes when on float charge is indicative of full charge. This method is in accordance with IEEE Standard 450-1980, "IEEE Recommended Practices for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations," and is, therefore, acceptable. However, the use of battery charging current in lieu of specific gravity, is acceptable only for Categories A and B parameters within 7 days following the service and performance discharge tests. At other times, the specific gravity parameter must be used.

Based on its review of the licensee's submittals, the staff concludes that the proposed TS and Bases changes to allow the use of the battery charging current in lieu of elertrolyte specific gravity to verify operability of ESF batteries following service and performance discharge tests are in accordance with IEEE Standard 450-1980, and are, therefore, 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 and changes the surveillance requirements. 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 September 5, 1990 (55 FR 36342), 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: October 9, 1990

Principal Contributor: N.K. Trehan