February 16, 1995

Mr. C. Randy Hutchinson
Vice President, Operations GGNS
Entergy Operations, Inc.
Post Office Box 756
Port Gibson, Mississippi 39150

SUBJECT: ISSUANCE OF AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. NPF-29 - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M87065)

Dear Mr. Hutchinson:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 116 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. This amendment revises the Technical Specifications (TSs) in response to your application dated July 14, 1993.

The amendment revises TS requirements for the hydrogen ignition system (HIS). The amendment also removes several tables related to the HIS in accordance with guidance contained in Generic Letter 91-08, "Removal of Component Lists From Technical Specifications."

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:
Paul W. O'Connor, 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. 116 to NPF-29
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 116
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 14, 1993 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. 116, 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

Paul W. O'Connor

Paul W. O'Connor, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the
Technical Specifications

Date of Issuance: February 16, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 116

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 pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE PAGES	INSERT PAGES
3/4 6-59	3/4 6-59
3/4 6-60 thru 3/4 6-66	3/4 6-60
-	B 3/4 6-8b
B 3/4 6-9	B 3/4 6-9

CONTAINMENT SYSTEMS

CONTAINMENT AND DRYWELL HYDROGEN IGNITION SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.7.2 The containment and drywell hydrogen ignition system consisting of two independent containment and drywell hydrogen ignition subsystems shall be OPERABLE with each subsystem consisting of at least 90% of its igniter assemblies operable.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2

ACTION:

With one containment and drywell hydrogen ignition subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.6.7.2 The containment and drywell hydrogen ignition system shall be demonstrated OPERABLE:

a. At least once per 184 days by energizing the supply breakers for each igniter circuit and performing current/voltage measurements of each circuit. If more than 3 of the included igniter assemblies of either subsystem are determined to be inoperable, increase the surveillance frequency to a 92-day interval until the condition no longer exists.

b. At least once per 18 months, by energizing each glow plug and:

   1. verifying a surface temperature of at least 1700°F for each of the accessible igniters, and

   2. verifying by measurements sufficient current/voltage to develop 1700°F surface temperature for those igniter assemblies in inaccessible areas.

CONTAINMENT SYSTEMS

COMBUSTIBLE GAS CONTROL PURGE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.7.3 Two independent drywell purge system subsystems shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With one drywell purge system subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.6.7.3 Each drywell purge system subsystem shall be demonstrated OPERABLE:

a. At least once per 92 days by:

1. Starting the subsystem from the control room, and

2. Verifying that the system operates for at least 15 minutes.

b. At least once per 18 months by:

1. Verifying a subsystem flow rate of at least 1000 cfm during subsystem operation for at least 15 minutes.

2. Verifying the pressure differential required to open the vacuum breakers on the drywell purge compressor discharge lines, from the closed position, to be less than or equal to 1.0 psid.

c. Verifying the OPERABILITY of the drywell purge compressor discharge line vacuum breaker isolation valve differential pressure actuation instrumentation with an opening setpoint of 0.0 to 1.0 psid (Drywell minus Containment) by performance of a:

1. CHANNEL CHECK at least once per 24 hours,

2. CHANNEL FUNCTIONAL TEST at least once per 31 days, and

3. CHANNEL CALIBRATION at least once per 18 months.

SECONDARY CONTAINMENT (Continued)

The surveillance testing for verifying heat dissipation for the Standby Gas Treatment System heaters is performed in accordance with ANSI N510-1975 with the exception of the 5% current phase balance criteria of Section 14.2.3. The offsite power system for the Grand Gulf Nuclear Station consists of a non-transpositional 500-kV grid. The grid has an inherent unbalanced load distribution which results in unbalanced voltages in the plant. Voltage unbalances exceeding the ANSI N510-1975 5% criteria are not atypical. For painting, fire and chemical releases other than carbon dioxide in any ventilation zone communicating with the standby gas treatment system, the surveillance requirements are adequate to ensure charcoal adsorbency is maintained. A release of carbon dioxide for any reason other than a fire will not adversely affect the charcoal's adsorbency and the surveillance requirement need not be performed.

3/4.6.7 ATMOSPHERE CONTROL

The OPERABILITY of the systems required for the detection and control of hydrogen gas ensures that these systems will be available to maintain the hydrogen concentration within the containment below its flammable limit during post-LOCA conditions. The drywell purge system in combination with the hydrogen recombiner system is designed to control the hydrogen produced following a DBA LOCA. The hydrogen ignition system is used to control the excessive quantity of hydrogen during the unlikely occurrence of a degraded core accident. Both the hydrogen recombiner and the hydrogen ignition systems are capable of controlling the expected hydrogen generation associated with (1) zirconium-water reactions, (2) radiolytic decomposition of water, and (3) corrosion of metals within containment.

Two 100% capacity hydrogen recombiners are provided for the control of hydrogen in the containment. Either recombiner is capable of maintaining the hydrogen concentration below the flammability limits following a DBA LOCA.

Two 100% drywell purge systems are the primary means of H^2 control within the drywell. Either system is capable of purging hydrogen produced following a LOCA into the containment volume. Hydrogen generated from the metal-water reaction and radiolysis is assumed to evolve to the drywell atmosphere and form a homogenous mixture through natural forces and mechanical turbulence (ECCS pipe break flow). The drywell purge system forces drywell atmosphere through the horizontal vents and into the containment and as a result no bypass path exists. The hydrogen control system is consistent with the recommendations of GDC 41, "Containment Atmosphere Cleanup" and the recommendations of Regulatory Guide 1.7, "Control of Combustible Gas Concentrations in Containment Following a LOCA," September 1976.

The primary containment and drywell hydrogen ignition system is a part of the combustible gas control system required by 10 CFR 50.44 to reduce the hydrogen concentration in the primary containment following a degraded core accident. Ignitors are distributed throughout the primary containment and drywell. The OPERABILITY of at least 90% of igniter assemblies in either hydrogen ignition subsystem will maintain an effective coverage throughout the containment and drywell. Some areas may be categorized as inaccessible areas due to high levels of radiation or personnel safety. Examples of inaccessible areas include such enclosures as the heat exchanger, filter demineralizer, and the reactor water clean-up pump rooms. Special surveillance requirements are provided for igniters located in inaccessible areas to reduce personnel exposure and other safety concerns. A list of required hydrogen igniters is contained in applicable plant procedures by electrical division/circuit and physical location.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 116 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 14, 1993, the licensee (Entergy Operations, Inc.), submitted a request for changes to the Grand Gulf Nuclear Station, Unit 1 (GGNS) technical specifications (TSs). The amendment revises TS requirements for the hydrogen ignition system (HIS). These changes are consistent with generic TSs proposed by the Mark III Containment Hydrogen Control Owners Group (HCOG) as modified by the NRC staff's safety evaluation (SE) dated August 6, 1990 (available as NUREG-1417). The amendment would also remove several tables related to the HIS in accordance with guidance contained in Generic Letter (GL) 91-08, "Removal of Component Lists From Technical Specifications." The proposed changes are consistent with guidance contained in NUREG-1434, "Standard Technical Specifications - General Electric Plants, BWR/6."

2.0 BACKGROUND

The primary containment and drywell hydrogen igniters are a part of the combustible gas control measures required by 10 CFR 50.44 and General Design Criterion (GDC) 41, "Containment Atmosphere Cleanup," to reduce the hydrogen concentration in the primary containment following a degraded core accident. The hydrogen igniters ensure the combustion of hydrogen in a manner such that containment overpressure failure is prevented as a result of a postulated degraded core accident.

10 CFR 50.44 requires boiling water reactor units with Mark III containments to install suitable hydrogen control systems. The hydrogen igniters are installed to accommodate an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water. This requirement was placed on reactor units with Mark III containments because they were not designed for inerting and because of their low design pressure. Calculations indicate that if hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water were to collect in primary containment, the resulting hydrogen concentration would be far above the lower flammability limit such that, without the hydrogen igniters, if the hydrogen were ignited from a random ignition source, the resulting hydrogen burn would seriously challenge the primary containment.

The hydrogen igniters are based on the concept of controlled ignition using thermal igniters designed to be capable of functioning in a post accident environment, seismically supported and capable of actuation from the control room. Igniters are distributed throughout the drywell and primary containment. The hydrogen igniters are arranged in two independent divisions such that each containment region has two igniters, one from each division, controlled and powered redundantly so that ignition would occur in each region even if one division failed to energize.

When the hydrogen igniters are energized they heat up to a surface temperature $\geq$ 1700°F. At this temperature, they ignite the hydrogen gas that is present in the airspace in the vicinity of the igniter. The hydrogen igniters depend on the dispersed location of the igniters so that local pockets of hydrogen at increased concentrations would burn before reaching a hydrogen concentration significantly higher than the lower flammability limit.

The hydrogen igniters cause hydrogen in containment to burn in a controlled manner as it accumulates following a degraded core accident. Burning occurs at the lower flammability concentration, where the resulting temperatures and pressures are relatively benign. Without the system, hydrogen could build up to higher concentrations that could result in a violent reaction if ignited by a random ignition source after such a buildup.

The hydrogen igniters are not included for mitigation of a Design Basis Accident (DBA) because an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water is far in excess of the hydrogen calculated for the limiting DBA loss-of-coolant accident (LOCA). The hydrogen concentration resulting from a DBA can be maintained less than the flammability limit using the hydrogen recombiners. However, the hydrogen igniters have been shown by probabilistic risk analysis to be a significant contributor to limiting the severity of accident sequences that are commonly found to dominate risk for units with Mark III containment.

3.0 EVALUATION

Requirements regarding operability of adjacent igniters and igniters in enclosed areas have been deleted. These provisions were originally included due to uncertainty regarding the mixing characteristics of hydrogen released to the containment atmosphere. The tests conducted by the HCOG indicated that hydrogen exhibits better mixing characteristics than originally assumed. Based on these results, the HCOG concluded that these additional requirements, intended to preclude the formation of localized, high-concentration hydrogen pockets, were not warranted. Based on the information provided by the HCOG regarding hydrogen mixing, the staff concluded in the 1990 SE that there is reasonable assurance that deletion of these requirements would not have an adverse effect on the effectiveness of the HIS; therefore, deletion of these requirements is acceptable.

The specification has been revised to redefine the HIS as being operable based solely on subsystem status, in lieu of using circuit and subsystem criteria. The licensee proposed to redefine an operable subsystem as consisting of "at

least 90% of its igniter assemblies operable," in lieu of "two circuits . . . with no more than two igniter assemblies inoperable per circuit," (i.e., no more than four inoperable igniters per subsystem). The staff considers this to be an acceptable administrative change, since the number of operable igniters required has not been changed (i.e., "at least 90% of a subsystem's igniter assemblies operable" is equivalent to "no more than four inoperable igniters per subsystem").

Table 4.6.7.2-1, "Number of Igniters by Circuit," has been deleted. This table identifies the minimum number of igniters required to be operable per circuit. Since operability of the igniter system will be based solely on subsystem status, as noted above, this table is no longer required. This change is acceptable to the staff.

The required action for one inoperable subsystem has been revised by increasing the time allowed for restoration of an inoperable system to operable status from 7 days to 30 days. The 30 day completion time is based on the low probability of occurrence of the degraded core accident for which the system is designed, the amount of time available following event initiation for operator action to prevent hydrogen accumulation, and the low probabilty of failure of the operable igniter system. The staff concluded in the 1990 SE that a 30 day restoration time for one inoperable subsystem is appropriate.

Table 3.6.7.2-1, "Hydrogen Igniter Circuits," and Table 3.6.7.2-2, "Hydrogen Igniters and Locations," have been relocated to plant procedures in accordance with NRC GL 91-08, "Removal of Component Lists From Technical Specifications."

10 CFR 50.36 does not require these tables to be retained in the TSs. Requirements related to the operability, applicability, and surveillance requirements, including performance of testing to ensure operability of the hydrogen igniters is retained in the TSs due to the hydrogen igniters' importance in mitigating the consequences of an accident. However, the staff determined that the inclusion of specific information regarding igniter circuits and locations is a design detail related to the licensee's safety analyses that is adequately controlled by the requirements of 10 CFR 50.59. Therefore, the continued processing of license amendments related to revisions of the affected tables where the revisions to those requirements do not involve an unreviewed safety question under 10 CFR 50.59, would afford no significant benefit with regard to protecting the public health and safety.

The staff has concluded, therefore, that relocation of these tables is acceptable because (1) their inclusion in TSs is not specifically required by 10 CFR 50.36 or other regulations, (2) the affected tables have been relocated to plant procedures which are adequately controlled by 10 CFR 50.59, and their inclusion in the TSs is not required to avert an immediate threat to the public health and safety, and (3) changes that are deemed to involve an unreviewed safety question will require prior NRC approval in accordance with 10 CFR 50.59(c).

The changes contained in this amendment are consistent with the generic TSs approved by the staff in its SE dated August 6, 1990, and with guidance contained in NUREG-1434. As required by the 1990 SE, the licensee has confirmed that the assumptions used to develop the generic TSs are also valid for the Grand Gulf Nuclear Station configuration.

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

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC 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 offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 46232). Accordingly, the 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 the amendment.

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: R. Schaaf

Date: February 16, 1995