October 23, 2001

Mr. William A. Eaton
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: REVISION OF TECHNICAL SPECIFICATIONS FOR EMERGENCY DIESEL ENGINE LUBE OIL SYSTEM INVENTORIES (TAC NO. MB0423)

Dear Mr. Eaton:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 149 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1 (GGNS). This amendment revises the Technical Specifications (TSs) in response to your application dated October 24, 2000, as supplemented by letters dated June 18 and August 21, 2001.

The amendment changes TS 3.8.3 regarding the lube oil inventories for GGNS Divisions I, II, and III emergency diesel generators (EDGs), and will result in additional margins for lube oil availability to provide for EDG operability for seven days following a postulated design basis accident.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

S. Patrick Sekerak, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures: 1. Amendment No. 149 to NPF-29
2. Safety Evaluation

cc w/encls: See next page

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Sincerely,
/RA/
S. Patrick Sekerak, Project Manager, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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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. 149
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 October 24, 2000, as supplemented by letters dated June 18 and August 21, 2001, 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. 149 , 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 and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: October 23, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 149

FACILITY OPERATING LICENSE NO. NPF-29

DOCKET NO. 50-416

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3.8-22	3.8-22
3.8-24	3.8-24

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 149 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 application dated October 24, 2000, as supplemented by letters dated June 18 and August 21, 2001, Entergy Operations, Inc., et al. (EOI or the licensee) submitted a request for changes to the Grand Gulf Nuclear Station, Unit 1 (GGNS), Technical Specifications (TSs). The changes would revise TS 3.8.3 regarding the lube oil inventories for Division I, II, and III emergency diesel generators (EDGs), and will provide additional margins for lube oil inventories to ensure EDG operability for seven days following a design basis accident (DBA).

The June 18 and August 21, 2001, supplemental letters provided clarifying information that did not change the scope of the original *Federal Register* notice or the initial no significant hazards consideration determination.

2.0 BACKGROUND

The GGNS licensing basis for the Diesel Engine Lubricating System provides for EDG lube oil sump capacities sufficient to support seven days of EDG operation at rated load. The GGNS TS requirements for EDG lube oil inventory were originally established by GGNS engineering calculations using nominal oil consumption rates specified by the diesel engine manufacturer. Subsequent EDG surveillance identified apparent lube oil consumption rates in excess of the vendor-specified nominal values. GGNS-revised calculations, using higher lube oil consumption rates, have determined the need to revise the TS 3.8.3 values specified for lube oil inventory.

3.0 EVALUATION

3.0.1 Systems Safety and Analysis Evaluation

3.0.1.1 Discussion

Currently, TS 3.8.3 requires that the lube oil inventory for each Division I and II EDG be < 205 gallons and ≥ 176 gallons, and the Division III EDG be < 101 gallons and ≥ 87 gallons to provide seven days of operation for each EDG following a DBA. The current TS lube oil inventory requirements were established based on vendor-supplied consumption rates of 1.21 gallons per hour for Division I and II EDGs and 0.6 gallons per hour for the Division III EDG. In

1998, the licensee identified that the lube oil consumption rate for the Division III EDG may exceed the vendor-specified nominal consumption rate. The licensee determined that the lube oil consumption rate for the Division III EDG would be 0.94 gallons per hour instead of 0.6 gallons per hour. Subsequently, the licensee specified a new inventory requirement based on a more conservative consumption rate for the Division III EDG, which has been implemented via Administrative Controls. Therefore, they are proposing to change TS 3.8.3 to increase the lube oil inventory for the Division III EDG from "< 101 gallons and $\geq$ 87 gallons" to "< 202 gallons and $\geq$ 173 gallons."

3.0.1.2 Evaluation

The licensee proposed a TS limit (< 202 gallons and $\geq$ 173 gallons) on the lube oil inventory for the Division III EDG. This TS limit, which was conservatively based on doubling the vendor-specified rate for the Division III EDG, will ensure that sufficient margin exists in the lube oil inventory for any potential increase in the Division III EDG lube oil consumption rate to support a Division III EDG seven-day operation following a DBA.

The licensee did not identify any deficiency in the vendor-supplied lube oil consumption rate for Division I and II EDGs. However, to provide a conservative margin and a consistent method of establishing the lube oil inventory for Division I and II EDGs, as is done for the Division III EDG, the licensee proposed a TS limit (< 410 gallons and $\geq$ 350 gallons) on the lube oil inventory for the Division I and II EDGs, also based on doubling the vendor-specified rate for each of the EDGs.

Based on U.S. Nuclear Regulatory Commission (the Commission) review of the licensee's rationale, the staff concludes that the proposed lube oil inventory, which is to be maintained for each of the EDGs, will be sufficient to support the required EDG seven-day operation at GGNS following a DBA, and therefore, is acceptable.

The licensee stated that there is no physical modification required to support the proposed lube oil inventory for Division I and II EDGs. The lube oil sump for each of the Division I and II EDGs has a capacity of 1,200 gallons. A slight increase in the sump level will accommodate the proposed lube oil inventory. The staff finds that increasing the sump level slightly to accommodate the required lube oil inventory is an appropriate resolution for these EDGs, and therefore, is acceptable.

For the Division III EDG (two diesel engines and one generator), the sump capacities are too small to accommodate the same solution in order to provide lube oil inventory, at the newly assumed oil consumption rates, for seven days of EDG operation following a DBA. To ensure sufficient margin exists for any potential increase in the lube oil consumption rate, the licensee stated that a dedicated storage skid capable of holding three 55 gallon barrels of oil will be installed in the EDG room. Lube oil will be manually added to diesel engines as needed. This skid was designed to meet engineering criteria which prevent creation of a seismic II/I hazard within the Division III EDG room. The licensee also updated the fire hazard analysis to ensure that existing design requirements were still valid, and that the ability to achieve and maintain safe shutdown was not adversely affected.

In the licensee's June 18, 2001, response to the staff's Request for Additional Information (RAI), the licensee discussed how the lube oil will be transferred from the skid-mounted barrels

to the Division III EDG. The licensee stated that the transfer method consists of attaching a manual pump to the barrels and discharging lube oil via a rubber hose to the engine sumps (this is similar to the normal maintenance practice for refilling the sumps after oil changeout). The oil transfer-related equipment is tagged as being required by TS 3.8.3, and is located in the Division III EDG room safe storage area where it will be available for immediate use. Also, there are provisions in the system operation procedures and surveillance procedures for periodic monitoring of the lube oil, and for alerting operations personnel when lube oil should be added to the individual EDG.

Based on the staff's review of the licensee's rationale, it finds that the licensee is capable of transferring makeup lube oil from the skid mounted barrels to the Division III EDG following a postulated DBA.

3.0.1.3 Conclusion

Based on the staff's review of the licensee's proposed increase in the lube oil inventory for the EDGs, the rationale, and the provisions in the system operation procedures and surveillance procedures for periodic monitoring of the lube oil, it concludes that GGNS will have a reliable and sufficient lube oil inventory to support seven days of operation for each EDG following a DBA. Therefore, the licensee's proposed changes to TS 3.8.3 regarding the lube oil inventories for Division I, II, and III EDGs are acceptable.

3.0.2 Fire Protection Engineering Evaluation

3.0.2.1 Discussion

By application dated October 24, 2000, as supplemented by letters dated June 18 and August 21, 2001, the licensee requested a change to their TSs for the diesel engine lube oil system inventory requirements to ensure that there are adequate oil supplies to compensate for any future changes in oil consumption rates. Due to the limited size of the engine oil sumps for the Division III EDG, a physical change to the facility is required to accommodate the increased capacity for these engines. Therefore, EOI proposed to install a dedicated storage skid capable of holding the contents of three 55 gallon barrels of lube oil, to be installed in the DG room.

In a letter dated April 12, 2001, the staff sent an RAI to EOI asking that they discuss the changes to the fire protection program in more detail. By supplemental letter dated June 18, 2001, the licensee responded to the staff's RAI. EOI reported that only two changes resulted to the fire hazards analysis (FHA) as a result of adding the dedicated lube oil storage skid: (1) the fire in the Division III EDG room (fire area 63) increased from a duration of less than 45 minutes to less than 60 minutes, and (2) a different type of combustible material was being added to this room (75 feet of rubber hose). The hose is used to transfer oil from the barrels to the engine sump.

In addition, the staff requested that EOI provide the analysis which assessed that the ability to achieve and maintain safe shutdown was not adversely affected with the addition of the lube oil storage skid. The licensee responded that a fire in fire area 63 will not damage or propagate to redundant safe shutdown components because it is separated from all other areas by a three-hour-rated fire barrier, and this area contains no 10 CFR Part 50 Appendix R safe shutdown components/equipment.

The staff asked EOI to describe the relationship of the lube oil storage skid to combustibles, potential ignition sources, safe shutdown equipment or cables, rated fire barriers/doors, automatic suppression and detection systems, manual fire protection features, and ventilation systems in fire area 63. In the licensee's RAI response, they stated that the lube oil storage skid is located along the north end of the west wall. The licensee further responded that the location of combustibles to the lube oil storage skid includes the following:

- lube oil in the west engine of fire area 63 (located approximately 6 feet to the east)
- electrical cables in trays (located approximately 20 feet to the south and 15 feet above floor level in fire area 63)
- electrical control panels (located approximately 18 feet south in fire area 63)

Furthermore, fire area 63 is protected by an area-wide, automatic pre-action sprinkler system; actuated heat detectors; ultraviolet flame detection for early warning; and accessibility to manual hose streams and portable fire extinguishers. All suppression and detection alarm systems annunciate in the main control room. The lube oil storage skid is located in an open area that is adequately covered with suppression and detection systems. Ventilation for this area consists of room supply fans which exhaust through the EDG building corridor to the outside.

Finally, the staff asked the licensee to discuss what measures are in place to prevent or detect oil leakage from the skid-mounted barrels and to discuss all actions or built-in features that would minimize the potential for a fire and limit the ability of the oil to spread beyond the lube oil storage skid. The licensee stated that the barrels to be used for the skid are to be closed and sealed to prevent sloshing/leakage, and stored inside a welded steel pan or tank capable of holding 110% of the barrels' contents (185 gallons). The staff asked the licensee to provide the dimensions of the welded steel pan/tank during a telephone conference call on July 9, 2001. The licensee stated that the internal dimensions for length, width, and height of the steel tank/pan containing the oil in the event of a spill are 47 ½ inches x 47 ½ inches x 19 inches. The outside dimensions of the pan are 48 inches x 48 inches. The licensee further stated that any leakage will be contained within the steel pan. The barrels will be tightly restrained together, in accordance with the requirements of an established plant procedure and seismic storage requirements standard. The design requirements for the skid preclude overturning of the skid during a seismic event and resultant spillage of the contents. In addition, fire area 63 room conditions are monitored by plant operators on a regular basis (once per shift or every 12 hours) to check for oil and water leakage in the room.

3.0.2.2 Evaluation

During the July 9, 2001, telephone conference call with the licensee, the staff asked the licensee to clarify if the room exhaust from the Division III EDG room is exhausted into corridor 1D301. The staff's concern was that, in the event of a fire, smoke products would also be exhausted into corridor 1D301 and prevent operator access to perform manual actions in the Division I and II EDG rooms. The licensee was able to address the staff's concern during a follow-up telephone conference call on July 10, 2001. During this conversation, the licensee stated that the ventilation system for fire area 63 takes suction on the west end of the Division III EDG room by door 1D312, and exhausts through a vent opening along the east end of the building into corridor 1D301. Fire area 63 has three-hour rated fire dampers that fuse at

165 °F, which allows the dampers to close to prevent the passage of flames. Corridor 1D301 is an open corridor which vents directly to the outside environment and would not allow smoke products to build up to prevent access to the Division I and II EDG rooms. The licensee noted that additional access to each EDG room is available through separate doors located on the west wall of each room. This would allow operators to enter the Division I and II EDG rooms from the west end of the building in the event that the smoke in corridor 1D301 hinders access along the east end of the building.

The staff was also concerned that an oil spill (liquid pool fire) could adversely affect safe shutdown of the plant. In the event of an oil spill, the contents would be contained within a welded steel pan or tank. Therefore, since the design of the welded steel pan or tank is capable of holding 110% of its contents and would not overturn during a seismic event, the oil would not spill over and spread to safety-related equipment, which would provide a means of propagation for a fire. Furthermore, lube oil, which has a relatively high flash point, would require localized heating to achieve ignition. The licensee responded in their July 18, 2001, RAI response that the electrical control panels, which are the only fixed ignition source (other than the diesel engine) are located approximately 18 feet south of the storage skid. Therefore, the electrical control panels would not be considered a “localized” ignition source with respect to the lube oil skid.

In addition, the staff was concerned that the licensee did not specifically state that the provisions of the National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code," for safe storage of combustible materials were followed. NFPA 30 includes minimum requirements for the safe storage and use of a great variety of flammable and combustible liquids commonly available. NUREG-0800, Section 9.5.1, "Fire Protection Program," contains the guidelines to provide assurance, through defense-in-depth, that a fire will not prevent the performance of safe shutdown functions or increase the risk of radioactive releases to the environment. It also contains criteria for evaluating potential fire hazards for safety-related plant areas. Position C.5.d.4, "Control of Combustibles," of NUREG-0800 states that the "...storage of flammable liquids should, as a minimum, comply with the requirements of NFPA 30."

During the telephone conference call of July 9, 2001, the licensee stated that they followed the applicable guidance of NFPA 30 in fire area 63, and provided additional clarification in a supplemental submittal dated August 21, 2001. In the August 21, 2001, supplemental letter, the licensee stated that NFPA 30 1996 Edition was used as one of the criteria for determining adequacy of the storage of additional lube oil in the Division III EDG room. The type of lube oil used is Mobilgard 450 NC, having a flash point of 500 °F, which is classified by NFPA 30 as a Class IIIB combustible liquid. For storage of 165 gallons of a Class IIIB combustible liquid, NFPA 30 does not specify any containment or drainage requirements. However, the licensee’s design provides for both containment and for drainage, even though not specifically required by NFPA 30.

During the July 9, 2001, telephone conference call, the staff asked the licensee if they performed calculations to ensure that the drains were adequately sized to accommodate the additional fuel load and the sprinkler suppression system water. The licensee replied that the existing FHA has enough margin to bound the additional fire loading represented by the additional lube oil inventory. In addition, the existing analysis (which includes the sprinkler suppression system/hose stream runoff) bounds the additional fuel load because the drains

were originally designed in fire area 63 to handle a greater capacity than is currently being stored. Therefore, since the drains were sized for a larger capacity, the additional fuel load remains bounded by the existing FHA.

Finally, the staff was also concerned that flames resulting from a lube oil fire could impinge on the ceiling to cause ceiling collapse and ignition of equipment or cables close to the ceiling. The licensee's RAI response states that the area above the lube oil storage skid is open and would not expose electrical cable in trays to a fire. The electrical cable in trays are located 20 feet south of the lube oil storage skid. In addition, an ultraviolet flame detection system is provided for fire area 63 and would cause actuation of the automatic pre-action sprinkler system to suppress or control a lube oil fire. Additionally, the ceiling is supported by structural steel, which is coated with a three-hour fireproofing barrier.

3.0.2.3 Conclusion

The staff's review of the information provided by the licensee shows that any oil leakage from the barrels would be contained in the welded steel pan or tank, and would not be subject to overturning. In the event of an oil spill, the drains are adequately sized to safely discharge the combustible oil and any subsequent sprinkler suppression system/hose stream runoff. The fire protection features in fire area 63 are installed and designed to adequately detect and control any EDG or lubricating oil fire. Furthermore, smoke exhausted to the outdoor open corridor 1D301 would not prevent operator access to the Division I and II EDG rooms. Finally, the licensee's inspections are performed on a routine basis by plant operators to check for oil and water leakage in fire area 63.

On this basis, the staff has reasonable assurance that the licensee has maintained defense-in-depth in accordance with the Standard Review Plan, NUREG-0800, Section 9.5.1, "Fire Protection Program," and that the additional combustible load in fire area 63 does not adversely affect their ability to obtain safe shutdown since there are no safe shutdown components located in fire area 63.

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. 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 (66 FR 7680 dated January 24, 2001). 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 Contributors: David Shum
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Date: October 23, 2001

Grand Gulf Nuclear Station

cc:

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