

August 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 - CORRECTION LETTER FOR SAFETY EVALUATION FOR EMERGENCY LICENSE AMENDMENT RE: IMPLEMENTATION OF TECHNICAL SPECIFICATION 3.3.4.1, LIMITING CONDITION FOR OPERATION 3.3.4.1 b. (TAC NO. MB2595)

Dear Mr. Eaton:

On August 10, 2001, the Nuclear Regulatory Commission (NRC, the staff) issued an emergency license amendment to Facility Operating License No. NPF-29 (Amendment Number 148). This amendment revised the Technical Specifications (TSs) in response to your application dated August 10, 2001.

The amendment authorized implementation of TS 3.3.4.1, Limiting Condition for Operation 3.3.4.1 b. to be consistent with NUREG-1434, "Standard Technical Specifications General Electric Plants, BWR [Boiling Water Reactor]/6," Volume 1, Revision 2, dated June 2001. The amendment allowed revision of reactor operational limits, as specified in the Grand Gulf Nuclear Station, Unit 1 (GGNS) Core Operating Limits Report, to compensate for the inoperability of the End Of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation.

After issuing the amendment, the staff had discussions with GGNS personnel regarding what your engineering staff considered to be an inaccurate statement in the NRC staff's Safety Evaluation (SE) enclosed with the amendment. In Section 3.0 on page 3 of the SE, the staff summarized the purpose of the EOC-RPT Instrumentation, and included the statement, "...The EOC-RPT anticipates the pressure transient that will result from a generator load rejection event, and it causes the reactor recirculation pumps to trip, as well, so that the forced circulation of water through the reactor core stops...." GGNS explained that when the EOC-RPT breakers trip open, the recirculation pumps downshift to slow speed (Reference GGNS TS B 3.3.4.1), which slows the forced circulation of water through the reactor core, but does not stop forced circulation, as stated in the staff's SE. Your staff requested that a correction to the above statement in the SE be issued.

Upon review of your explanation of the EOC-RPT trip function, the staff agrees that the SE should be corrected. The statement above has been revised to read, "...The EOC-RPT anticipates the pressure transient that will result from a generator load rejection event, and it causes the reactor recirculation pumps to trip, as well, so that the forced circulation of water through the reactor core slows...." Additionally, a sentence within the same paragraph of the

W. A. Eaton

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SE has been revised by deleting the first word, "Natural." This sentence now reads, "...Circulation of water through the core continues at a lower rate which is sufficient to remove energy from the fuel...." Enclosed with this letter is a replacement page 3 for the staff's SE enclosed with License Amendment Number 148, dated August 10, 2001.

This revision does not change the staff's conclusions regarding the acceptability of your implementation of TS 3.3.4.1, Limiting Condition for Operation 3.3.4.1 b. Furthermore, the correction does not alter the emergency circumstances discussed in the staff's SE dated August 10, 2001, nor does it change the staff's final no significant hazards determination included in the SE.

If you have any further questions regarding this matter, please contact me at 301-415-2623.

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

Enclosure: As stated

cc: See next page

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The MCPR limits that are referred to in this new LCO would be incorporated into a new version of the GGNS COLR, which the licensee has committed to complete within 30 days of issuance of this amendment. In addition, the licensee has agreed to take the following actions until the new COLR limits have been developed and implemented:

1. Intentional operation with feedwater heaters out of service will not be allowed.
2. Interim MCPR operating limits will be implemented, as discussed below.
3. The existing EOC-RPT instrumentation will not be disabled, and will continue to provide protection for all transients except the small subset for which the licensee has determined that it does not actuate.

The purpose of the EOC-RPT is to provide additional MCPR operating margin. At the end of a normal operating cycle, the neutron flux shape in the reactor is such that the effectiveness ("worth") of the control rods when they are initially inserted during a scram is lower than it is earlier in the operating cycle. During a postulated pressurization transient such as a generator load rejection event, the control rod worth during the first few feet of insertion may not be sufficient to reduce reactor power quickly enough to ensure that the fuel meets the specified acceptable fuel design limits. The EOC-RPT anticipates the pressure transient that will result from a generator load rejection event, and it causes the reactor recirculation pumps to trip, as well, so that the forced circulation of water through the reactor core slows. When this occurs, the coolant void fraction (the relative amount of steam vs. liquid water) in the core rises, reducing neutron moderation and therefore reducing reactor power. The combined effects of the EOC-RPT and the scram reduce fuel bundle power more rapidly than does a scram alone, resulting in an increased margin to the MCPR SL. Circulation of water through the core continues at a lower rate which is sufficient to remove energy from the fuel. The EOC-RPT therefore reduces the severity of the transient with regard to the fuel thermal limits.

The EOC-RPT reduces the severity of these transients at all times during the fuel cycle, but it was intended to have its greatest effect at the end-of-cycle. GGNS analyses of this event were done by the fuel vendor (Framatome ANP Richland) using approved NRC methods, as described in the licensee's August 10, 2001 letter. The vendor has partially re-analyzed the plant behavior for the limiting transients with the EOC-RPT out of service, and developed new, more limiting MCPR values that will be incorporated into the COLR, and into the core monitoring software in the plant process computer.

In its submittal, the licensee stated that FRAMATOME has evaluated the impact of the EOC-RPT out-of-service condition, and has identified several adjustments to the MCPR limits that are necessary to support operation with no EOC-RPT from the beginning of cycle (core average exposure 19,658 MWd/MTU) until mid-cycle (core average exposure 30,840 Mwd/MTU). At this point in the cycle, the core average exposure is about 22,000 Mwd/MTU. These adjustments will be entered into the COLR and into the core monitoring software in the plant process computer, and they effectively change the initial conditions for the transients under consideration. With the new initial conditions, which are more restrictive than the case with the EOC-RPT in operation, the margin to reactor fuel thermal limits during these transients would be restored to acceptable values.

Although FRAMATOME has completed some of the analyses that are needed to support this new TS LCO, it has not completed the analyses for the Feedwater Heater out of

Grand Gulf Nuclear Station

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May 1999