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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENTS NOS. 151 AND 89 TO

FACILITY OPERATING LICENSES DPR-57 AND NPF-5

GEORGIA POWER COMPANY
OGLETHORPE POWER CORPORATION
MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA
CITY OF DALTON, GEORGIA

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-321 AND 50-366

I. INTRODUCTION

By letter dated October 21, 1987 (Reference 1), Georgia Power Company (the licensee) requested changes to the Technical Specifications (TS) for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, that would: (1) revise the Minimum Critical Power Ratio (MCPR) scram time parameters for Unit 2 and move the definitions of these parameters to the Bases section of the TS; (2) reduce the Option A MCPR limit from 1.37 to 1.33 for Unit 2 8x8 fuel; (3) revise an existing Average Planar Linear Heat Generation Rate (APLHGR) curve and modify the existing figure for Maximum APLHGR Flow Factor ($MAPFAC_F$) for Unit 2 to reflect thermal-mechanical and Emergency Core Cooling System (ECCS) limits on four Lead Fuel Assemblies (LFAs) which are expected to be part of the Reload 7 fuel batch for Unit 2; and (4) change the Refueling and Design Features sections of the TS for both Units 1 and 2 to allow loading of any four fuel assemblies which meet certain analytical criteria around each source range monitor prior to a full fuel load. In response to a staff request, the licensee provided by letter dated January 8, 1988, additional information regarding the controls that would be maintained when initially loading the four fuel assemblies around each source range monitor. This additional information clarified the licensee's intent, and did not alter the requested TS changes, or affect the staff's initial determination published in the Federal Register on December 16, 1987.

II. EVALUATION

The proposed TS changes are discussed individually.

(1) Revise the MCPR scram time parameters for Unit 2.

This proposed change has to do with the Option A and Option B scram speed formulation. The licensee proposes to change the constants used in determining the Option B scram speed limit. The change would be from the constants based on the GENESIS set of methods to those approved by the staff from a larger data base for the GEMINI methods. This is an acceptable change. The licensee also proposes to move the formula and the definitions and associated constants for the various scram times used in determining

MCPR limits via the Option A and Option B methods to the Bases section of the TS. Detailed discussion of the scram time calculations would continue to be provided in plant procedures. This relocation of the formula and definitions to the Bases section of the TS is the same as the staff previously required for Unit 1 (Reference 2) and is acceptable.

The overall changes to the scram time parameters for Unit 2 are the same as were previously approved by the staff for Unit 1 (Reference 2). We conclude that they are acceptable for Unit 2.

(2) Reduce the Option A MCPR limit from 1.37 to 1.33 for all Unit 2 8x8 fuel.

TS Figure 3.2.3-1 presents a curve of MCPR limits as a function of average measured scram speed (ODYN Code, Option A and B) for all 8x8 fuel types. The licensee proposes to reduce the Option A limit from 1.37 to 1.33 (thereby changing the curve in Figure 3.2.3-1) as a result of the change from the GENISIS to the GEMINI methods and uncertainty analysis. The GEMINI method is approved by the staff and the proposed change in the MCPR limit for Option A scram speed is reasonable and acceptable.

(3) Revise an existing APLHGR curve, TS Figure 3.2.1-9, and the existing $MAPFAC_F$ figure, TS Figure 3.2.1-12, for Unit 2 to include thermal-mechanical and ECCS limits on four Lead Fuel Assemblies (LFAs) which are expected to be part of the Reload 7 fuel batch for Unit 2.

The licensee proposes to load up to four 9x9 LFAs from the Advanced Nuclear Fuels Corporation (ANF) as part of the Reload 7 fuel batch for unit 2. These 9x9 fuel assemblies have been designed neutronically to replace the 8x8 fuel bundles which otherwise would be used. Analyses by the manufacturer (Reference 3) demonstrate that the 9x9 fuel has an equivalent or better ECCS-LOCA response as compared to the existing 8x8 fuel assemblies and that the 9x9 fuel can withstand the same mechanical forces as the existing fuel. The 9x9 fuel has improved heat transfer characteristics and lower stored energy in the fuel rods as compared to the existing fuel.

To account for the presence of these LFAs in the Reload 7 fuel batch, the licensee proposes to modify TS Figure 3.2.1-9 by adding a new axis to the MAPLHGR curve to reflect the fact that the 9x9 LFAs will have APLHGR limits that are equivalent on a planar power basis to the existing 8x8 fuel. TS Figure 3.2.1-12 would be modified to show that it applies to the 9x9 fuel as well as to the existing 8x8 fuel. The Reference 3 analyses providing the LFA MAPLHGR values, and the descriptions, fuel analyses, and proposed analyses for operation with the fuel in Hatch 2, are acceptable.

(4) Change the Refueling and Design Features sections of the TS for both Units 1 and 2 to allow loading of any four fuel assemblies which meet certain analytical criteria around each source range monitor prior to a full fuel load.

Existing TS 3.10.C for Unit 1 and 4.9.2.c for Unit 2 require that during a core reload, up to four fuel assemblies will be loaded into their previous positions around each of the four Source Range Monitors (SRMs) in order to

obtain the TS required 3 cps count rate on each monitor prior to proceeding with the core loading. The reason for using the previously irradiated fuel assemblies around each of the SRMs, as discussed in the TS Bases, is to ensure subcriticality of the 2x2 fuel bundle arrays prior to the time the required 3 cps is achieved. The licensee states that this procedure leads to additional fuel handling during the reload process since the assemblies initially reloaded around the SRMs typically are scheduled either for discharge or for placement in other core positions. To avoid this extra handling of the fuel, the licensee proposes to allow initial reloading of any fuel assemblies in the 2x2 arrays around the SRMs provided that subcriticality of the arrays can be ensured.

The FSAR for Hatch Unit 2, in Section 9.1.2.3.2 describes the results of analyses of various combinations of fuel bundles in the spent-fuel storage pool. Among these is a 2x2 array of fuel bundles of the highest reactivity manufactured by General Electric (koo = 1.35) located outside the storage rack area and separated from the rack by 12 inches of water. Reactivity calculations for this arrangement resulted in a subcritical k_{eff} = 0.856. The licensee argues, correctly, that a 2x2 array of fuel assemblies around an SRM is analogous to the 2x2 array analyzed for the spent fuel pool, since each array is separated by more than 12 inches from each of the other arrays. Thus, even if four fuel assemblies with the highest reactivity were loaded into the initial 2x2 array around the SRM, the array would be subcritical. In practice, four new fuel assemblies would not be loaded around an SRM because fuel management would mandate interspersing some new assemblies with assemblies removed from the previous cycle. Thus, at least one or two previously irradiated assemblies would be included in any 2x2 array, which should be sufficient to initiate the gamma-neutron reactions necessary to attain the minimum count rate of 3 cps before proceeding with the core reload.

To assure that any fuel that could be loaded into a 2x2 array around the SRM does not cause a critical configuration, the licensee proposes to amend the Design Features sections of the TS (Section 5.E.1 for Unit 1 and Section 5.6.1 for Unit 2) to require that all fuel be evaluated to assure that any credible configuration (i.e., up to a 2x2 array) outside the racks shall not have a k_{eff} of greater than 0.95.

The staff had some concern that with the wording proposed by the licensee, where "any" four bundles could be loaded around each SRM, it would be possible to have greater reactivity associated with these 2x2 arrays than would be permitted by the physics design of the core reload. By letter dated January 8, 1988, the licensee clarified this matter, stating that while "any" four fuel bundles could be loaded around each SRM, the actual bundles loaded would be subject to the TS shutdown margin requirements.

The staff has examined the licensee's proposed changes and we agree that by maintaining a k_{eff} of not greater than 0.95 for any credible 2x2 fuel assembly array, subcriticality will be ensured until required 3 cps count rate is attained on the SRMs. Further, the staff agrees that by assuring that the actual bundles loaded around the SRMs are subject to the TS shutdown margin requirements, the licensee has ensured that the reactivity of the final core reload will be not in excess of that permitted by the physics design for the core reload. Accordingly, we find this proposed change acceptable.

In summary, the staff has examined each of the changes proposed by the licensee, and has found that each change is acceptable. We thus conclude that the licensee's requested TS changes as contained in its October 21, 1987 letter, are acceptable.

III. ENVIRONMENTAL CONSIDERATION

The amendments involve a change in use of facility components located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there should be no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendments meet 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 amendments.

IV. CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (52 FR 47783) on December 16, 1987, and consulted with the state of Georgia. No public comments were received, and the state of Georgia did not have any comments.

We have 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES

1. Letter from J. P. O'Reilly, Georgia Power Company, to the U. S Nuclear Regulatory Commission, dated October 21, 1987.

2. Letter from L. P. Crocker, USNRC, to J. P. O'Reilly, Georiga Power Company, subject: Issuance of Amendment Nos. 139 and 76 to Facility Operating Licenses DPR-57 and NPF-5 - Edwin I. Hatch Nuclear Plant, Units 1 and 2 (TACs 64779/64780), dated June 1, 1987.

3. Advanced Nuclear Fuels Corporation, ANF-87-95, Revision 1, "Hatch 9X9 Lead Fuel Assemblies Safety Analysis Report," July 21, 1987.

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Dated: January 22, 1988