Distribution
Docket
ORB #3
Local PDR
NRC PDR
VStello
KGoller
GLear
CParrish
SNowicki
Attorney, OELD
OI&E (5)
BJones (4)
BScharf (10)
JMcGough
DEisenhut
ACRS (16)
OPA (Clare Miles)
DRoss
TBAbernathy
JRBuchanan

OCT 5 1977

Docket No. 50-321

Georgia Power Company
Oglethorpe Electric Membership Corporation
Municipal Electric Association of Georgia
City of Dalton, Georgia
ATTN: Mr. I. S. Mitchell, III
Vice President and Secretary
Georgia Power Company
Atlanta, Georgia 30302

Gentlemen:

The Commission has issued the enclosed Amendment No. 45 to Facility Operating License No. DPR-57 for the Edwin I. Hatch Nuclear Plant Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated July 18, 1977.

The amendment modifies the HNP-1 Technical Specifications by changing the mid-cycle point, for 7x7 and 8x8 fuel assemblies, of the Minimum Critical Power Ratio (MCPR) curves. These curves show the limiting values for MCPR versus burnup of fuel. The mid-cycle point is changed from 2000 megawatt days/ton (MWD/T) before end-of-cycle 2 (EOC-2) to 1500 MWD/T before EOC 2.

Copies of the Safety Evaluation and the FEDERAL REGISTER Notice are also enclosed.

Sincerely,

Original signed by

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:
1. Amendment No. 45
2. Safety Evaluation
3. FEDERAL REGISTER Notice

cc: See page 2

Subject to change on page 2 of SER

Count 1

*SEE PREVIOUS YELLOW FOR CONCURRENCES

GD

OFFICE	ORB #3	ORB #3	OELD	ORB #3		
SURNAME	*CParrish	SNowicki:mjf	B. Smith	GLear		
DATE	9/23/77	9/26/77	9/29/77	10/4/77		

NRC FORM 318 (9-76) NRCM 0240

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Sincerely,

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

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2. Safety Evaluation
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cc w/enclosures:
See page 2

OFFICE		ORB #3	ORB #3	OELD	ORB #3	
SURNAME		CParrish	SNowicki:mjf		GLear	
DATE		9/23/77	9/ /77	/ /77	/ /77	

NRC FORM 318 (9-76) NRCM 0240 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1976 — 626-624

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

October 5, 1977

Docket No. 50-321

Georgia Power Company
Oglethorpe Electric Membership Corporation
Municipal Electric Association of Georgia
City of Dalton, Georgia
ATTN: Mr. I. S. Mitchell, III
Vice President and Secretary
Georgia Power Company
Atlanta, Georgia 30302

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Sincerely,

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:
1. Amendment No. 45
2. Safety Evaluation
3. FEDERAL REGISTER Notice

cc: See page 2

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U. S. Environmental Protection Agency
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Atlanta, Georgia 30308

Appling County Public Library
Parker Street
Baxley, Georgia 31513

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

GEORGIA POWER COMPANY
OGLETHORPE ELECTRIC MEMBERSHIP CORPORATION

DOCKET NO. 50-321

EDWIN I. HATCH NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 45
License No. DPR-57

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

   A. The application for amendment by Georgia Power Company, Oglethorpe Electric Membership Corporation, Municipal Electric Association of Georgia and City of Dalton, Georgia, (the licensees) dated July 18, 1977, 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. DPR-57 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 45, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 5, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 45

TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-57

DOCKET NO. 50-321

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Replace
3.11-2	3.11-2
3.11-4	3.11-4

3.11.B. Linear Heat Generation Rate (LHGR) (Continued)

LHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

C. Minimum Critical Power Ratio (MCPR)

The MCPR limit is specified as a function of fuel average exposure. From BOC2 to 1500 MWD/t before EOC2 the MCPR limit is 1.20 for 7x7 and 1.23 for 8x8 fuels. From 1500 MWD/t before EOC2 to EOC2 the MCPR limit is 1.25 for 7x7 and 1.32 for 8x8 fuels. During power operation, MCPR shall be as above at rated power and flow. If at any time during operation it is determined by normal surveillance that the limiting value for MCPR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits. For core flows other than rated the MCPR shall be K_f times the MCPR value applicable above, where K_f is as shown in Figure 3.11-3.

D. Reporting Requirements

If any of the limiting values identified in Specifications 3.11.A., B., or C. are exceeded, a Reportable Occurrence report shall be submitted.

If the corrective action is taken, as described, a thirty-day written report will meet the requirements of this specification.

4.11.C. Minimum Critical Power Ratio (MCPR)

MCPR shall be determined daily during reactor power operation at $\geq$ 25% rated thermal power and following any change in power level or distribution that would cause operation with a limiting control rod pattern as described in the bases for Specification 3.3.F.

3.11.B. Linear Heat Generation Rate (LHGR)

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of Reference 4 and References 5 and 6, and assumes a linearly increasing variation in axial gaps between core bottom and top, and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking. The LHGR as a function of core height shall be checked daily during reactor operation at $\geq$ 25% power to determine if fuel burnup, or control rod movement has caused changes in power distribution. For LHGR to be a limiting value below 25% rated thermal power, the MTPF would have to be greater than 10 which is precluded by a considerable margin when employing any permissible control rod pattern.

C. Minimum Critical Power Ratio (MCPR)

The required operating limit MCPR as specified in Specification 3.11.C is derived from the established fuel cladding integrity Safety Limit MCPR of 1.06 and an analysis of abnormal operational transients presented in Reference 7.

Various transient events will reduce the MCPR below the operating MCPR. To assure that the fuel cladding integrity safety limit (MCPR of 1.06) is not violated during anticipated abnormal operational transients, the most limiting transients have been analyzed to determine which one results in the largest reduction in critical power ratio (Δ MCPR). Addition of the largest Δ MCPR to the safety limit MCPR gives the minimum operating limit MCPR to avoid violation of the safety limit should the most limiting transient occur. The type of transients evaluated were loss of flow, increase in pressure and power, positive reactivity insertion, and coolant temperature decrease.

The evaluation of a given transient begins with the system initial parameters shown in Table 6-2 of Reference 9 that are input to a GE core dynamic behavior transient computer program described in Reference 8. Also, the void reactivity coefficients that were input to the transient calculational procedure are based on a new method of calculation termed NEV which provides a better agreement between the calculated and plant instrument power distributions. The outputs of this program along with the initial MCPR form the input for further analyses of the thermally limiting bundle with the single channel transient thermal hydraulic SCAT code described in Reference 1. The principal result of this evaluation is the reduction in MCPR caused by the transient.

From BOC2 to 1500 MWD/t before EOC2 the most limiting transient was the rod withdrawal error which resulted in a Δ CPR of 0.14 for 7x7 and 0.17 for 8x8 fuel. Consequently, the minimum required operating limit MCPR is 1.20 for 7x7 and 1.23 for 8x8 fuel. The most limiting transient from 1500 MWD/t before EOC2 to EOC2 was the generator load rejection with failure of the bypass valves which resulted in a Δ CPR of 0.19 for 7x7 fuel and 0.26 for 8x8 fuel. Consequently, the minimum required operating limit MCPR is as specified in Section 3.11.C.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 45 TO FACILITY OPERATING LICENSE NO. DPR-57

GEORGIA POWER COMPANY

OGLETHORPE ELECTRIC MEMBERSHIP CORPORATION

MUNICIPAL ELECTRIC ASSOCIATION OF GEORGIA

CITY OF DALTON, GEORGIA

EDWIN I. HATCH NUCLEAR PLANT UNIT NO. 1

DOCKET NO. 50-321

Introduction

By letter dated July 18, 1977, Georgia Power Company (GPC) requested an amendment to Facility Operating License No. DPR-57 for Edwin I. Hatch Nuclear Plant Unit No. 1 (HNP-1). The proposed amendment would modify the HNP-1 Technical Specifications by changing the mid-cycle point at which the limiting values of the Minimum Critical Power Ratio (MCPR) for the 7x7 and 8x8 fuel change. The mid-cycle point would be changed from 2000 megawatt days/ton (MWD/t) before end-of-cycle 2 (EOC 2) to 1500 MWD/t before EOC 2.

Discussion

On May 6, 1977 the NRC issued License Amendment No. 42 for HNP-1 (Reference 4) which authorized operation with the current MCPR limits which consists of two operating ranges for 7x7 and 8x8 fuel. The operating limits change from one value which is used from BOC 2 to mid-cycle to another value which extends to the EOC 2. The current values of the limiting MCPR's and the mid-cycle point at which they change were determined by GPC and were presented in the Cycle 2 reload submittals (References 2 and 3).

In the first submittal (Reference 2), GPC assumed that 92 bundles of freshly loaded fuel were modified with two bypass flow holes in the lower tie plate. The remainder of the fuel bundles were assumed to be unchanged. Using these assumptions for fuel exposure up to 2000 MWD/t before EOC 2, the most limiting transient for both 7x7 and 8x8 fuel is the rod withdrawal error (RWE), which results in a reduction in MCPR of 0.18 for the 7x7 fuel and 0.19 for the 8x8 fuel. For fuel exposure greater than 2000 MWD/t before EOC 2, the most limiting transients for both 7x7 and 8x8 fuel is the EOC 2 turbine trip without bypass, which results in a reduction in MCPR of 0.29 for the 7x7 fuel and 0.38 for the 8x8 fuel.

In the second submittal (Reference 3) GPC determined the limiting values of MCPR for the core with all the fuel modified by drilling bypass holes in the lower plates. With this assumption a new set of limiting MCPR values resulted from the analyses. For fuel exposure up to 2000 MWD/t before EOC 2, the most limiting transient (RWE) results in a reduction in MCPR of 0.14 for 7x7 fuel and 0.17 for the 8x8 fuel. For fuel exposures greater than 2000 MWD/t before EOC 2, the most limiting transient (turbine trip without bypass) results in a reduction in MCPR of 0.19 for the 7x7 fuel and 0.26 for the 8x8 fuel. This second submittal applies to the current fuel cycle and was used to determine the operating MCPR for the current Technical Specifications. Addition of these reductions in CPR, given in the second submittal, to the safety limit MCPR (1.06) results in the minimum operating limit MCPR for each fuel type. Thus the operating limit exposures for less than 2000 MWD/t before EOC 2 is 1.20 for 7x7 fuel and 1.23 for 8x8 fuel. For exposures greater than 2000 MWD/t before EOC 2, the operating limit MCPR is 1.25 for 7x7 fuel and 1.32 for 8x8 fuel.

Evaluation

Prior to reloading the core for Cycle 2 operation, GPC chose the mid-cycle MCPR transition point and the more limiting analyses corresponding to a partially drilled core for determination of the operating MCPR values because of their uncertainty of being able to drill all of the fuel bundles during the refueling outage. However, drilling of all of the fuel bundles was accomplished successfully prior to Cycle 2 startup.

Since the drilling of the full core was successful, GPC evaluated changing the mid-cycle point where the operating MCPR limits become more restrictive (Reference 5). The turbine trip without bypass evaluated at 1500 MWD/t before EOC 2 results in maximum reduction in the Critical Power Ratio (CPR) of 0.10 for the 7x7 fuel and 0.14 for the 8x8 fuel. These reductions in CPR result in MCPR values that are less restrictive than MCPR limits derived from the RWE analysis. Therefore, it is still valid to use the results of RWE analysis in the range from BOC 2 to 1500 MWD/t before EOC 2. The results of the turbine trip without bypass evaluated at EOC 2 (worst condition) are used for the limiting MCPR in the range from 1500 MWD/t before EOC 2 to EOC 2, the same as in the current Technical Specifications. Therefore, the minimum operating limit MCPR in the range from BOC 2 to 1500 MWD/t before EOC 2 is 1.20 for 7x7 fuel and 1.23 for 8x8 fuel and in the range from 1500 MWD/t before EOC 2 to EOC 2 is 1.25 for 7x7 fuel and 1.32 for 8x8 fuel.

Because the transients were analyzed using conservative models and inputs, the staff finds that the operating limit MCPRs discussed above provide reasonable assurance that the calculated consequences of the anticipated abnormal transients do not violate the thermal and plastic strain limits of the fuel or the pressure limits of the reactor coolant boundary and are acceptable for Cycle 2 operation.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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 security or to the health and safety of the public.

Dated: October 4, 1977

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-321

GEORGIA POWER COMPANY

OGLETHORPE ELECTRIC MEMBERSHIP CORPORATION
MUNICIPAL ELECTRIC ASSOCIATION OF GEORGIA
CITY OF DALTON, GEORGIA

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 45 to Facility Operating License No. DPR-57 issued to Georgia Power Company, Oglethorpe Electric Membership Corporation, Municipal Electric Association of Georgia and City of Dalton, Georgia, which revised Technical Specifications for operation of the Edwin I. Hatch Nuclear Plant, Unit No. 1, located in Appling County, Georgia. The amendment is effective as of its date of issuance.

The amendment modifies the HNP-1 Technical Specifications by changing the mid-cycle point, for 7x7 and 8x8 fuel assemblies, of the Minimum Critical Power Ratio (MCPR) curves. These curves show the limiting values for MCPR versus burnup of fuel. The mid-cycle point is changed from 2000 megawatt days/ton (MWD/T) before end-of-cycle 2 (EOC 2) to 1500 MWD/T before EOC 2.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated July 18, 1977, (2) Amendment No. 45 to License No. DPR-57 and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Appling County Public Library, Parker Street, Baxley, Georgia 31513. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 5th day of October 1977.

FOR THE NUCLEAR REGULATORY COMMISSION

George Lear

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors