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*the southern electric system*

SL-215  
2470N

February 28, 1986

Director of Nuclear Reactor Regulation  
Attention: Mr. D. Muller, Project Director  
BWR Project Directorate No. 2  
Division of Boiling Water Reactor Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

NRC DOCKETS 50-321, 50-366  
OPERATING LICENSES DPR-57, NPP-5  
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2  
REQUEST TO REVISE FACILITY OPERATING LICENSES  
PROPOSED EXTENSION OF LICENSE DURATIONS

Gentlemen:

In accordance with the provisions of 10 CFR 50.90, Georgia Power Company (GPC) hereby proposes changes to Operating Licenses DPR-57 and NPP-5. The proposed changes would modify the license durations such that the licenses would remain valid for 40 years commencing with the issuance of the operating license. This change is consistent with applicable regulations regarding issuance of operating licenses and with actions taken by the Commission in numerous operating license applications or amendments since 1982.

The current licensed terms for operation of Hatch Units 1 and 2 is 40 years, beginning with the issuance of the construction permits. Accounting for the time elapsed for plant construction, the effective terms of the operating licenses are about 35 years for Unit 1 and 34 years for Unit 2. Extension of the Plant Hatch effective operating license terms to 40 years will benefit residential and industrial customers throughout the GPC service area considerably by continuing to provide a reliable source of electricity at a low cost. The requested expiration dates for the licenses are:

DPR-57 (Unit 1)	August 6, 2014
NPP-5 (Unit 2)	June 13, 2018

The changes to the above licenses should be made as shown on Attachment 1.

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Director of Nuclear Reactor Regulation  
Attention: Mr. D. Muller, Project Director  
BWR Project Directorate No. 2  
February 28, 1986  
Page Two

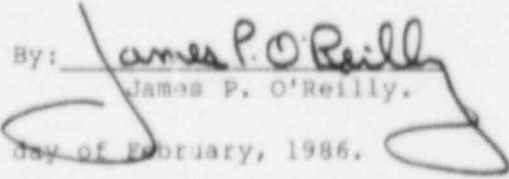
GPC has found that the proposed change would not have a significant impact on safety or the environment. Attachments 2 and 3 presents the basis for our determination that the proposed change does not constitute an unreviewed safety question or involve a significant hazards consideration. Attachment 4 provides a summary of our analyses supporting these findings.

Payment of filing fee is enclosed.

Pursuant to the requirements of 10 CFR 50.91, Mr. J. L. Ledbetter of the Environmental Protection Division of the Georgia Department of Natural Resources will be sent a copy of this letter and all applicable attachments.

James P. O'Reilly states that he is Senior Vice-President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and that to the best of his knowledge and belief the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By:   
James P. O'Reilly.

Sworn to and subscribed before me this 28th day of February, 1986.



Notary Public

SHC/mb

Enclosures

xc: Mr. J. T. Beckham, Jr.  
Mr. H. C. Nix, Jr.  
Senior Resident Inspector  
Dr. J. N. Grace, (NRC-Region II)  
Mr. J. L. Ledbetter

ATTACHMENT 1

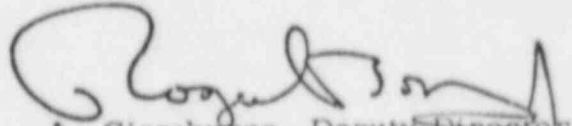
CHANGES TO PLANT HATCH UNITS 1 AND 2  
OPERATING LICENSES, DPR-57 AND NPF-5

-4-

D. This license is effective as of the date of issuance and shall expire at midnight, ~~September 30, 2009.~~

August 6, 2014

FOR THE ATOMIC ENERGY COMMISSION



A. Giambusso, Deputy Director  
for Reactor Projects  
Directorate of Licensing

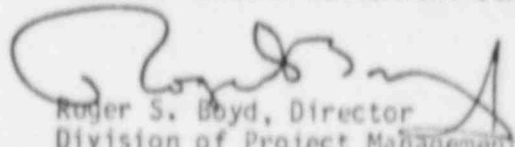
Attachment:  
Appendices A & B - Technical Specifications

Date of Issuance: AUG 6 1974

- 13 -

- (e) Power Company shall use its best efforts to amend any outstanding contract to which it is a party that contains provisions which are inconsistent with the conditions of this license;
  - (f) Power Company affirms that no consents are or will become necessary from Power Company's parent, affiliates or subsidiaries to enable Power Company to carry out its obligations hereunder or to enable the entities to enjoy their rights hereunder;
  - (g) All provisions of these conditions shall be subject to and implemented in accordance with the laws of the United States and of the State of Georgia, as applicable, and with rules, regulations and orders of agencies of both, as applicable.
- G. This license is effective as of the date of issuance and shall expire at midnight, ~~December 27, 2012~~  
June 13, 2018

FOR THE NUCLEAR REGULATORY COMMISSION



Roger S. Boyd, Director  
Division of Project Management  
Office of Nuclear Reactor Regulation

Attachments:

- 1. Appendices A and B - Technical Specifications
- 2. Items to be Completed Prior to Opening Main Steam Isolation Valves

Date of Issuance: JUN 13 1978

ATTACHMENT 2

NRC DOCKETS 50-321, 50-366  
OPERATING LICENSES DPR-57, NPP-5  
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2  
10 CFR 50.59 EVALUATION

Pursuant to 10 CFR 50.59, the Plant Review Board and Safety Review Board have reviewed the attached proposed amendments to the Plant Hatch Units 1 and 2 Operating Licenses and have determined that implementation of the proposed changes does not constitute an unreviewed safety question.

The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety are not increased above those analyzed in the FSAR due to this change because this proposed change does not involve any changes in the physical plant or plant operating procedures and methods. Surveillance and maintenance procedures are also not affected by the proposed change and such procedures will continue to ensure the availability of all required equipment.

The possibility of an accident or malfunction of a different type than analyzed in the FSAR does not result from this change because no new modes of operation have been introduced.

The margin of safety as defined in the Technical Specifications is not reduced because the proposed change does not affect the Technical Specifications.

ATTACHMENT 3

NRC DOCKETS 50-321, 50-366  
OPERATING LICENSES DPR-57, NPF-5  
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2  
10 CFR 50.92 EVALUATION

The proposed license amendments have been evaluated pursuant to the criteria of 10 CFR 50.92. Georgia Power Company has determined that these amendments do not involve a significant hazard. The basis for this determination is as follows:

- (a) The proposed amendments will not involve a significant increase in the probability or consequences of an accident previously evaluated because no physical changes to the plant or modifications of plant procedures are requested. Further, as demonstrated in Section 2 of Attachment 4, the proposed license extensions are within the current plant design bases.
- (b) The proposed amendments will not create the possibility of a new or different kind of accident from any previously evaluated for the reasons stated in (a) above.
- (c) The proposed amendment will not involve a significant reduction in a margin of safety for the reasons stated in (a) above.

ATTACHMENT 4

PLANT HATCH LICENSE EXTENSION  
SAFETY AND ENVIRONMENTAL ASSESSMENT



# PLANT HATCH LICENSE EXTENSION

## REPORT OUTLINE

### 1.0 INTRODUCTION

- 1.1 General
- 1.2 Need for License Extension
- 1.3 Description of Report

### 2.0 SAFETY IMPACT ANALYSIS

- 2.1 Electrical Equipment
- 2.2 Mechanical Equipment
- 2.3 Structures
- 2.4 Reactor Vessel
- 2.5 Safety Upgrades and Special Issues
- 2.6 Summary of Safety Impacts

### 3.0 ENVIRONMENTAL IMPACT ANALYSIS

- 3.1 Offsite Radiation Exposures
- 3.2 Onsite Radiation Exposure
- 3.3 Increase in Plant Radioactivity Inventories
- 3.4 Radioactive Waste Production
- 3.5 Nuclear Fuel Cycle Effects
- 3.6 Non-Radiological Effects
- 3.7 Summary of Environmental Effects
- 3.8 References

### 4.0 ALTERNATIVES TO LICENSE EXTENSION

- 4.1 Need for Power
- 4.2 Cost-Benefit of Extension

### 5.0 SUMMARY AND CONCLUSIONS

#### APPENDICES:

- A. ALARA Program Description
- B. Effectiveness of Plant ALARA Program

Plant Hatch License Extension  
Safety and Environmental Assessment

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1.0 Introduction

1.1 General

Section 103.c of the Atomic Energy Act of 1954 (42 USC 2133.c) authorizes the issuance of facility operating licenses for a period of time up to 40 years. The currently licensed term for Plant Hatch Units 1 and 2 is 40 years commencing with issuance of the construction permits. The Unit 1 license expires September 30, 2009; the Unit 2 license expires December 27, 2012. Accounting for the time that was required for plant construction, this represents an effective operating license term of 35 years for Unit 1 and 34 years for Unit 2. This report has been prepared to support the modification of the terms of these licenses such that the expiration dates are 40 years commencing with the issuance of the operating license. The requested expiration dates for the licenses are:

Unit 1	August 6, 2014
Unit 2	June 13, 2018

1.2 Need for License Amendment

The granting of the proposed license amendment will permit the operation of Hatch Units 1 and 2 for five and six years, respectively, beyond the current expiration dates. As demonstrated in Section 4 of this report the proposed amendment will permit the deferral of additional generating plant construction resulting in a considerable cost benefit.

1.3 Description of Report

This report contains three principal parts. The first (Section 2) is an assessment of the safety impact of the proposed license amendment. This section summarizes the assurances that the equipment and structures can safely remain in service for the requested 40-year service life. Section 2.6 contains a statement of the overall safety impact conclusions.

The second analysis area is that of environmental impact associated with the plants operating for additional years. The analyses in Section 3 of the report include assessment of the onsite and offsite radiation exposures, waste production, fuel cycle effects, and non-radiological environmental effects. Section 3.6 contains a statement of the overall environmental impact conclusions.

Plant Hatch License Extension  
Safety and Environmental Assessment

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The final analysis (section 4) deals with the cost effectiveness of the proposed license extension.

A summary of the report findings and evaluations under 10 CFR 50.92 and 10 CFR 51 are presented in Section 5. The two appendices are included to describe the Plant Hatch program of radiation protection and to demonstrate the effectiveness of the program in reducing radiation exposures.

Plant Hatch Licensing Extension  
Safety and Environmental Assessment

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**2.0 Safety Impact Analysis**

The material in this section of this report has been assembled to demonstrate that the public health and safety will not be adversely affected by this amendment to the plant operating license. Most of this information summarizes material previously provided to the NRC in the FSAR or other submittals.

**2.1 Electrical Equipment**

The electrical equipment at Plant Hatch has been subjected to an extensive review in response to the environmental qualification requirements of IE Bulletin 79-01B and 10 CFR 50.49. Georgia Power Company submitted a comprehensive report to NRC on February 1, 1981. That report, as revised, documents the life expectancy of all safety-related electrical equipment and the environmental conditions under which it is required to maintain its operability. As the report indicates, the Hatch environmental qualification program will ensure that the safety-related electrical equipment will be qualified for a service life of 40 years in its most severe normal operating environment.

**2.2 Mechanical Equipment**

The safety-related mechanical equipment is under the inservice inspection program as described in the Edwin I. Hatch Nuclear Plant-Units 1 and 2 Inservice Inspection Program submitted to the NRC by letter dated August 12, 1983. This document describes the programs for Class 1, 2, and 3 component and piping examinations and for pump and valve surveillance testing. It should be noted that the classification of components as ASME Class 1, 2, or 3 equivalent for inservice inspection does not imply that the components were designed in accordance with ASME requirements. The component design codes remain as stated in the FSAR.

These continuing inspections and tests assure the operability of the safety-related mechanical equipment regardless of the age of the plant.

**2.3 Structures**

The plant buildings are constructed of reinforced concrete and steel. Industrial experience with such materials establishes that a service life of well in excess of forty years can be anticipated.

The steel containment at Plant Hatch could be subjected to severe stresses in the event of a design basis accident. This structure has been analyzed for a forty year life while accounting for all hydrodynamic loads it will encounter. This analysis is documented in the HNP-2 FSAR, section 3.8.2.3.

#### 2.4 Reactor Vessel

The design of the reactor vessel and its internals considered the effects of 40 years of operation at full power with a plant capacity factor of 80% (32 effective full power years). Recent analyses have demonstrated that expected cumulative neutron fluences will not be a limiting consideration. In addition to these calculations, surveillance capsules placed inside the reactor vessel provide a means of monitoring the cumulative effects of power operation over the plant life.

Plant Hatch, Unit 1, recently pulled and evaluated a surveillance capsule to determine the potential for radiation induced embrittlement. Preliminary data from analysis of the specimen indicate that the maximum accumulated 1/4 T vessel end of life fluence is conservatively calculated to be  $1.9 \times 10^{18}$  n/cm<sup>2</sup>, based on flux wires from the surveillance capsule and appropriately modeled to provide the peak vessel location fluence. Plate and weld End-of-Life  $RT_{NDT}$  shift values utilized in the analysis were derived from the irradiated plate impact energy curves which were compared to unirradiated data.

The analysis addressed the expected vessel lifetime and concluded that no vessel annealing will be required before achieving 32 effective full power years of operation. This time interval is equivalent to a plant operating with a annual capacity factor of 80% for 40 years.

Although a surveillance specimen has not been analyzed for Unit 2, the results of the Unit 1 analysis are expected to be bounding for Unit 2. Because of the similarity of the two reactors, vessel fluence is expected to be very similar to that of Unit 1. In addition, the Unit 2 vessel plate material properties contain lower amounts of copper, phosphorus and nickel. Although the weld material impurities in the Unit 2 reactor vessel are slightly higher than Unit 1, the projected  $RT_{NDT}$  shift remains sufficiently low so that vessel annealing would not be required during a 40-year operating life.

#### 2.5 Safety Upgrades and Special Issues

Since the issuance of the operating licenses for Plant Hatch several new safety issues have emerged. These issues include fire protection, emergency planning, and post accident sampling and monitoring capability. As these issues have appeared, modifications have been made to both the physical plant and to the plant procedures. This ongoing program of plant improvement has resulted in the continual upgrading of plant equipment and a concomitant increase in safety.

## 2.6 Summary of Safety Impact

The request for amendment of the operating licenses is based on the fact that a 40-year service life was considered during the design and construction of the plant. Although this does not mean that some components will not wear out during the plant lifetime, design features were incorporated which maximize the inspectability of structures, systems and equipment. Surveillance and maintenance practices which were implemented in accordance with the ASME code and the facility Technical Specifications provide assurance that any unexpected degradation in plant equipment will be identified and corrected.

Aging analyses have been performed for all safety-related electrical equipment in accordance with 10 CFR 50.49, "Environmental qualification of electrical equipment important to safety for nuclear power plants", identifying qualified lifetimes for this equipment. These lifetimes will be incorporated into plant equipment maintenance and replacement practices to ensure that all safety-related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant. Mechanical equipment is routinely tested to ensure its operability. In the event of the occurrence of significant wear the mechanical components will be refurbished or replaced, thereby extending the lifetime of such equipment.

Based upon the above, it is concluded that extension of the operating licenses to allow a 40-year service life is consistent with the safety analysis in that all issues associated with plant aging have already been addressed in the FSAR and other licensing submittals.

### 3.0 Environmental Impact Assessment

This section deals with the effect of the proposed amendment on the environment. The environmental effects are assessed both onsite and offsite. Radiological effects are the principal subject of this section, with the non-radiological effects being addressed in section 3.5.

#### 3.1 Offsite Radiation Exposures

Offsite radiation exposures from normal plant operations and design basis accidents were assessed and documented in the plant FSARs. This section of the report provides an analysis of the effect of the proposed 40-year operating lifetime on these offsite radiation exposures.

##### 3.1.1 Normal Operation Exposures

The anticipated offsite radiation exposure from all known pathways to the most exposed individual was computed for each unit. The first step in the offsite dose calculation was the determination of the estimated annual releases of each isotope. The releases were then used as a source term for the calculation of the dose to the exposed individuals offsite. The analyses showed that both units are designed to assure that the design limits of 10 CFR 50, Appendix I are met.

On June 28, 1985, the NRC issued Amendment 110 to the Unit 1 operating license and Amendment 48 to the Unit 2 operating license. These amendments issued the Plant Hatch Radiological Effluent Technical Specifications and found that the HNP RETS are in compliance with NRC requirements regarding ALARA. The offsite environmental effect of the continued operation of Plant Hatch will be minimized by the plant's compliance with the RETS.

##### 3.1.2 Accident Exposure

The proposed amendment to the operating license will have no effect on the potential for the release of radioactivity in an accident. Recent data have indicated that the source terms developed for the Plant Hatch accident analyses were quite conservative. Thus it can reasonably be assumed that the offsite doses presented in the FSAR accident analyses are bounding.

The one analysis factor that has changed somewhat is the population in the vicinity of the plant. Although the actual population exceeds that which was originally forecast, the site is still in a very rural location. The site emergency planning process has accounted for the current population.

Plant Hatch License Extension  
Safety and Environmental Assessment

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**3.2 Onsite Radiation Exposure**

Onsite radiation exposure involves the exposure of plant workers to nuclear radiation. The amendment to the operational life of Plant Hatch will not involve onsite radiation exposures in excess of those commonly encountered in current plant operations.

**3.2.1 HNP ALARA Program**

Plant Hatch has developed and implemented a comprehensive ALARA program. This program is described in Appendix A.

As a result of the ALARA program, Plant Hatch has compiled an outstanding record in the minimization of the occupational radiation exposures. Appendix B demonstrates this Plant Hatch position as one of the leaders in the nuclear industry in the control and reduction of occupational exposures.

**3.2.2 Additional Refueling Outages**

The license amendment could involve three to five additional refueling outages. While a significant percentage of the total annual worker radiation exposure is encountered during such outages, relatively little of this exposure is associated with refueling operations. Most of the outage related exposure is due to the performance of maintenance, repairs, or modifications. This work is performed during outages to minimize the effect on plant safety and limit radiation exposures. The additional outages will not result in exposures outside the limits of 10 CFR 20. Any outage related exposure will be minimized by the ALARA program.

**3.3. Increase in Plant Radioactivity Inventories**

Radioactive isotope inventories in certain plant components are expected to increase as the plant ages. Experience has indicated that this buildup results in increased radiation dose rates in the vicinity of these components.

Radiation exposures inside the plant are carefully controlled under the Plant Hatch ALARA program (see Appendix A). As radioactive material builds up on a component the ALARA program provides for the use of added shielding, engineering controls or reduction of work times to reduce worker exposures. Such measures as discarding demineralizer beds upon reaching radioactivity limits and the use of decontamination techniques are also utilized to minimize worker exposure.



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The isotopes of primary concern in environmental effect assessment are the radioiodines and noble gases. These isotopes are produced in the nuclear fuel as by-products of nuclear fission. If the fuel does not leak the concentration of these fission products in the reactor cooling water will remain relatively low. In the event of fuel leakage the abundance of the fission products increases. This effect has been illustrated in Reference 3, Figure 3-7. That figure is included in this report as Figure 3-1. It illustrates the effect of variations in fuel performance upon the release of I-131 from the plant.

Since the release rate of noble gases and iodines is largely a function of fuel integrity the environmental effect of radionuclide inventory is minimal. The buildup does have an effect on the radiation levels inside the plant. This fact is of a lesser concern than the releases to the environment because the radiation exposure rates do not directly affect personnel exposures.

### 3.4 Radioactive Waste Production

Continued operation of Plant Hatch beyond its currently scheduled shutdown date will result in the production of additional quantities of radioactive waste. This section addresses the effect of the processing of these wastes.

#### 3.4.1 Gaseous Waste Releases

The gaseous radwaste treatment systems are described in Chapter 9 of the Hatch 1 FSAR and Chapter 11 of the Hatch 2 FSAR. These systems are designed to assure that the airborne releases from the plants are maintained ALARA during normal plant operations. Reference 3.7 (issued for Unit 2 operating license) documents NRC's evaluation of the ALARA compliance.

The Radiological Effluent Technical Specifications (RETS) issued in June of 1985 require that the equipment required for the maintenance of offsite doses ALARA be operable and be operated as required to maintain the releases ALARA.

#### 3.4.2 Liquid Waste Releases

The liquid waste treatment systems are described in Chapter 11 of the Hatch 2 FSAR (Unit 1 references the Unit 2 Chapter 11 writeup). Like the gaseous system, the liquid processing systems have been designed to meet the ALARA goals. These systems are also covered by the RETS to assure the system operability.

#### 3.4.3 Solid Waste Shipment

Operation of the plants beyond the current license expiration dates will necessitate the shipment of additional solid waste from the site. The annual rate of production of dry waste is not expected to change as a function of the age of the plant.

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Georgia Power Company has purchased a volume reduction system for Plant Vogtle. After Plant Vogtle is started up and the radwaste volume reduction system placed into routine service, the cost/benefit of waste volume reduction equipment at Plant Hatch will be assessed. Until Plant Vogtle experience becomes available GPC will continue to pursue cost effective operational procedures and will evaluate possible equipment modifications for their cost effectiveness.

The State of Georgia is a participant in the Southeast Regional Compact. As such, GPC expects to have burial space available at a Compact site for the remaining lifetime of Plant Hatch regardless of the length of operating life. GPC recognizes that certain restrictions on the available burial volume may be encountered. These restrictions will be considered when evaluating the efficacy of volume reduction modifications.

3.5 Nuclear Fuel Cycle Effects

3.5.1 Production of Additional High-Level Waste

The operation of Plant Hatch beyond its current license expiration date will produce spent fuel during the additional period of operation. No change is anticipated in the annual rate of production of spent fuel.

3.5.2 Onsite Spent Fuel Storage

The combined storage capacity of the two interconnected spent fuel storage pools at Plant Hatch is 6,026 bundles. Based upon current projections, this capacity would accommodate discharges to the year 2002. The ability to discharge one full core into the pool would end in the year 2000.

Georgia Power has a contract with the Department of Energy for the removal from the plant site and for the disposal of spent fuel. The contract provides for this service to commence in 1998. In the event that fuel removal becomes delayed and additional storage is required, this storage could be provided by onsite storage in casks. One dry storage cask design has been licensed by NRC for such use and other licensed casks are expected to be available in the late 1990s, if required.

### 3.6 Non-Radiological Impacts

The NRC's Staff's Final Environmental Statement (CP and OL stages) assessed the non-radiological impacts of plant operation as a function of plant design features, relative loss of renewable resources and relative loss or degradation of available habitat. Based on this assessment, the FES indicates adverse non-radiological impact would be minimal. These assessments, and the assumptions on which they are based, have been borne out by the actual operating history of the plant.

The summary of the cost-benefit analysis (reference 3.1, p. XI-11) stated that the amount of land withdrawn from agricultural and forestry uses was relatively small and that mitigation by the applicant in the form of a park, a visitor's center, a Boy Scout camping area, and the preservation of the north area of the site in its natural condition counterbalanced the conversion of some of the land to use as a power plant site. The Unit 2 FES (reference 3.2) further states that Hatch Unit 2 was designed to operate for 40 years and that beyond the useful life of the plant the site might continue to be utilized for the generation of electrical energy. Future land use would be dependent upon the type of decommissioning measures employed. The relative amount of land removed from forestry production for transmission corridors was judged to be small when compared with the large areas of remaining forests in surrounding counties. It was noted that cropping and pasturing were permitted and encouraged by the applicant on these rights-of-way (reference 3.1, p. V-1). The FES (reference 3.2, p. 5-2) concluded that there were no significant biological effects associated with the electric fields generated under or near the transmission lines.

Thermal impacts of plant operations on the water quality of the Altamaha River were determined to be negligible under anticipated discharge conditions (reference 3.1, pp. 5-2 - 5-3). Thermal effluent limits are currently regulated by the NPDES permit issued by the Georgia Environmental Protection Division. As a requirement of the NPDES permit a field thermal verification study was conducted by Georgia Power Company during 1980. Results of this field study satisfactorily demonstrated that the computer simulation model of the plant's thermal plume was accurate and also that the thermal plume temperatures were well within the prescribed mixing zone limits imposed under the NPDES permit (reference 3.3). Periodic monitoring of this mixing zone continues to be a condition of the NPDES permit.

Plant Hatch License Extension  
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All industrial chemical waste discharges and sanitary waste discharges to the Altamaha River are covered by the NPDES permit. All applicable EPA effluent guidelines and limitations are being met in accordance with the conditions of the current NPDES permit. The Staff analysis of the plant's chemical discharges indicated that these discharges would have negligible effects on the water quality of the Altamaha River (reference 3.2, pp. 5-2 - 5-6). The Staff also concluded that plant operations would not significantly effect either surface water or groundwater supplies (reference 3.2, p. 5-6). Both of these sources of water are currently covered by Georgia Environmental Protection Division permits.

The FES analyzed the site ecology, both terrestrial and aquatic (reference 3.2, pp. 2-9 through 2-20) including summary results from site biological monitoring programs, available literature, and information from State of Georgia creel surveys. The SER states that the only source of potential significant damage to the terrestrial environment from plant operation would be due to the operation of the closed cycle cooling system (reference 3.2, pp. 5-6 - 5-7), and required a study by the applicant for both Units 1 and 2. Aerial remote sensing was carried out to detect effects of cooling tower drift on surrounding vegetation from 1974 to 1981. Results of these surveys were reported in the Annual Surveillance Reports for the respective years. No evidence of cooling tower effects were observed during the entire period of the study.

Impacts of plant operation on the aquatic environment were discussed at length in the FES (reference 3.1, pp. V-6 - V-11, reference 3.2, pp. 5-6 - 5-19). The conclusion was that plant operations would not have significant effects on the biota of the Altamaha River. Environmental monitoring studies were conducted by Georgia Power Company and the results reported in the Annual Surveillance Reports. In addition a biological survey to determine the effects of the combined operation of Units 1 and 2 on the macroinvertebrate fauna (reference 3.4) and on the impingement and entrainment losses to the fish populations (reference 3.5) were conducted by Georgia Power Company during 1980 as a condition of the NPDES permit. Both of these studies satisfactorily demonstrated that there were no significant effects of combined plant operations on either the macroinvertebrate populations or on the fish populations, including the anadromous fish spawning runs.

All non-radiological monitoring and studies conducted as requirements of the FES-CP, FES, ETS, and NPDES permit have demonstrated that effects of the operation of Plant E. I. Hatch on both the terrestrial and aquatic environments are negligible. Since all of these studies were based on factors other than the term of plant operation, it is reasonable to conclude that extending the operating life of the plant would not adversely effect any segment of the environment near the plant.

FIGURE 3-1  
NEDO-21159-2

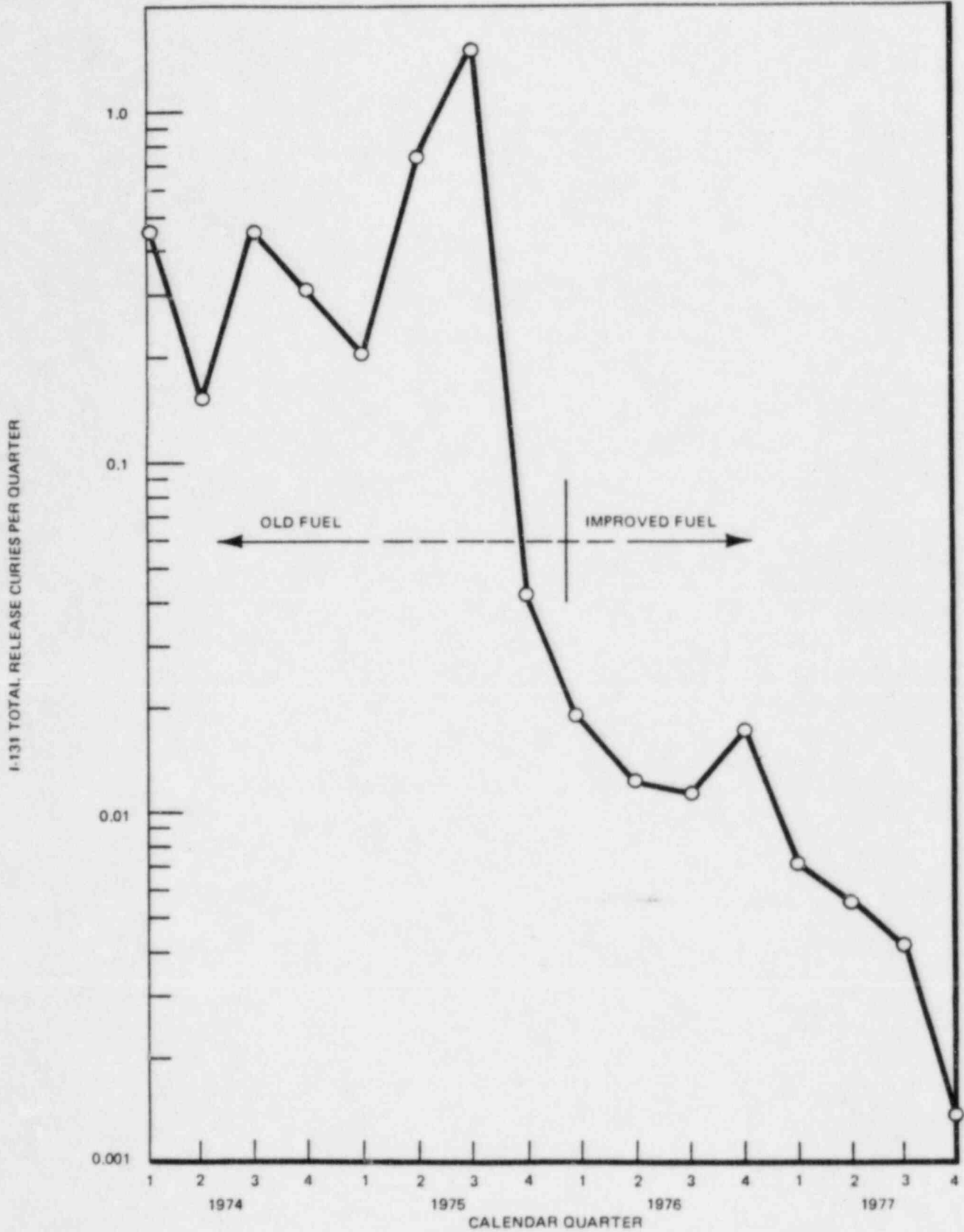


Figure 3-7. Calendar Quarter Total Plant Ventilation Release of I-131 versus Time, Monticello (Reactor, Turbine and Radwaste Buildings)

Plant Hatch License Extension  
Safety and Environmental Assessment

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3.7 Summary of Environmental Effects

Sections 3.1 and 3.2 demonstrate that there will be no significant onsite or offsite radiation exposures as a result of the proposed amendment. Section 3.3 demonstrates that the increase in plant radioactivity inventory will not have a significant effect on either onsite or offsite radiation exposures. Section 3.4 demonstrates that the radioactive waste effects are not significant. Section 3.5 demonstrates that the fuel cycle effects are minimal. Section 3.6 demonstrates that no significant non-radiological environmental effects are likely to be encountered.

Based upon these analyses, it is Georgia Power Company's conclusion that there are no significant radiological or non-radiological impacts associated with the proposed action and that the issuance by NRC of the proposed licensing amendments will have no significant impact on the quality of the human environment. Therefore, an environmental impact statement should not be prepared for this action.

3.8 References

- 3-1. U. S. Atomic Energy Commission, Final Environmental Statement for Edwin I. Hatch Nuclear Plant Unit 1 and Unit 2, Docket Nos. 50-321 and 50-366, October 1972.
- 3.2. U. S. Nuclear Regulatory Commission, Final Environmental Statement Related to Operation of Edwin I. Hatch Nuclear Plant Unit 2, Docket No. 50-366, March 1978.
- 3-3. Nichols, M. C. and Holder, S. D., March 1981, Plant Edwin I. Hatch Nuclear Plant Units 1 and 2 Thermal Plume Model Verification, Georgia Power Company, Atlanta, Georgia.
- 3-4. Guill, G.N., March 1981, Plant Edwin I. Hatch Units 1 and 2 Biological Survey on the Altamaha River, Appling County, GA., Georgia Power Company, Atlanta, Georgia.
- 3-5. Wiltz, J. W., March 1981, Plant Edwin I. Hatch 316(b) Demonstration on the Altamaha River in Appling County, GA., Georgia Power Company, Atlanta, Georgia.
- 3-6. NEDO-21159-2, Airborne Releases from BWRs for Environmental Impact Evaluations, Amendment 2, General Electric Co., October 1978.
- 3-7. Plant Hatch Final Environmental Statement, March 1978.

Plant Hatch Licensing Extension  
Safety and Environmental Assessment

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4.0 Alternatives to Life Extension

Georgia Power Company has investigated the alternatives to this amendment to the operating license. This investigation has confirmed that the extension of the useful operating life of an existing nuclear plant is clearly to the financial benefit of the plant owners and their electric power customers.

4.1 **Need for Power**

Analysis of load growth indicates that the peak demand for central station generated electricity will likely be growing through the first quarter of the twenty-first century. Estimates of the peak demand are indicated below.

Forecast of GPC Peak Demand Growth, 1985-2018  
(October 1985 Projection)

1990	14,491
2000	19,560
2007	23,566
2010	24,411
2014	25,600
2018	26,800

These data predict that the load will increase during the Plant Hatch extended lifetime. Therefore the retirement of any generating capacity will necessitate the startup of a similar size unit to provide the required power generation.

4.2 **Cost Benefit of Extension**

Expansion plan studies for the Georgia Power Company show the need for base load (coal or nuclear) operating capacity before and during the 2010-2018 periods. The extension of the life of each of the Hatch units will therefore delay the required in-service date of a new generating unit of a size similar to Plant Hatch.

Plant Hatch Licensing Extension  
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The accumulated present worth (1985 dollars discounted at 13%) of a five-year delay in the construction of the required replacement power plants (two 750 MW coal units) is \$154 million. This assumes there are no capital improvements required for the life extension in excess of those covered by normal operation and maintenance costs. In addition, the lower operating costs (total of fuel, operating and maintenance costs) of the nuclear units is a further cost benefit.

Thus the delay of Plant Hatch retirement is highly cost beneficial to both the plant owners and their customers.



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5.0 Summary and Conclusion

5.1 Evaluation per 10 CFR 50.92

The proposed license amendments have been evaluated pursuant to the criteria of 10 CFR 50.92. Georgia Power has determined that these amendments do not involve a significant hazard. The basis for this determination is as follows:

- (a) The proposed amendments will not involve a significant increase in the probability or consequences of an accident previously evaluated because no physical changes to the plant or modifications of plant procedures are requested. Further, as demonstrated in Section 2 of this report, the proposed license extensions are within the current plant design bases.
- (b) The proposed amendments will not create the possibility of a new or different kind of accident from any previously evaluated for the reasons stated in (a) above.
- (c) The proposed amendment will not involve a significant reduction in a margin of safety for the reasons stated in (a) above.

5.2 Georgia Power Company Review per 10 CFR 51

Georgia Power Company has reviewed the proposed amendments against the criteria of 10 CFR 51 and has concluded that an environmental impact statement should not be required. The data presented in Sections 3 and 4 of this report were prepared and formatted to assist the NRC staff in the preparation of the environmental assessment. Based upon the environmental evaluations in Section 3 and 4, Georgia Power Company concluded that there are no significant radiological or non-radiological impacts associated with the proposed action and that the proposed license amendments will not have a significant effect on the quality of the human environment.

APPENDIX A  
ALARA PROGRAM

1.0 POLICY

Georgia Power Company is committed to operating all activities at the Hatch Nuclear Plant in a manner that will not jeopardize employees or the public health and safety. Included is the obligation to maintain the radiation exposure to both occupationally exposed personnel and the general public at levels which are as low as reasonably achievable (ALARA) and which are in compliance with the NRC Regulations, Title 10, Code of Federal Regulations, Part 20 and the Final Safety Analysis Report Commitments. To fulfill this obligation, a radiation protection program which includes the applicable provisions of Regulatory Guides 8.8 and 8.10 has been implemented.

2.0 RESPONSIBILITY

The goal of the radiation protection program is to maintain individual and collective (man-rem) radiation doses to plant personnel and the general public at ALARA levels through improved operational practices, procedures, and equipment. Responsibility for implementing the radiation protection and ALARA programs resides with the Vice President of Nuclear Operations. Responsibility for implementing the program resides with the Health Physics Engineering Support staff.

Radiation safety is also an individual responsibility and each GPC and contractor employee working on this project shall make every reasonable effort to maintain individual and collective radiation exposures and releases of radioactive materials to unrestricted areas as far below Georgia Power Company Plant Hatch Nuclear Plant and regulatory limits as is reasonably achievable. Willful or habitual violation of radiation protection procedures will not be condoned, and continued disregard for these procedures will result in disciplinary action.

3.0 PROGRAM DEVELOPMENT

An ALARA Program has been developed to achieve the following:

- o Implementation of commitments made by Georgia Power Company management to establish a sound and effective ALARA Program.
- o Meet or exceed regulatory requirements/guidance.
- o Provide specific guidance necessary for program implementation plus periodic review and evaluation to ensure continued effectiveness.
- o Provide a workable and effective program that will simultaneously minimize the impact of additional time constraints on personnel involved with plant operations and maintenance activities and those individuals responsible for implementation of the ALARA Program.

The ALARA Program includes the following key elements:

- o A policy statement relative to the ALARA Program.
- o Descriptions of function, responsibilities and authorities for project personnel.
- o Systems to bring about management oversight, worker participation feedback and communication relative to exposure reduction.
- o Procedures to effect a maximum degree of exposure control and reduction.
- o Specific ALARA procedures which address the operational, administrative and engineering aspects of the ALARA Program.
- o A records and documentation system to enable accurate analysis and evaluation of ALARA Program performance.
- o A man-rem tracking system for task specific activities.

#### 4.0 PROCEDURES

A set of ALARA procedures has been developed to support the various projects at the plant. The major categories of procedures are:

- o Operational
- o Administrative
- o Engineering/Design

##### 4.1 Operational Procedures address the following:

- o Project preplanning exposure control
- o Conduct of Health Physics Program during Project
- o Task Planning (major and minor)
- o Job debriefing
- o Radiation Survey Profile for determining estimated versus actual man-rem accumulations
- o Radiation work man-rem estimation guidance
- o ALARA cost benefit analysis
- o Automated man-rem tracking system

4.2 Administrative Procedures address the following:

- o Establishment of Project ALARA exposure goals
- o Periodic evaluation of ALARA program effectiveness
- o Request for a specific ALARA evaluation

4.3 Engineering and Design ALARA which address the following:

- o Radiological considerations for design and engineering personnel
- o Specialized ALARA training

5.0 IMPLEMENTATION

Involving the Engineering Support group in the planning effort allows the group the time to design effective engineering controls to aid in exposure reduction. Shielding packages are designed which can dramatically reduce man-rem expenditures for a task. In addition, prework decontamination efforts will often reduce the need for respiratory protection devices, thus reducing time on the job. A major effort is made to minimize the need for respiratory protection equipment for each project.

Other possible exposure reduction measures that are evaluated include:

- o Remote tooling
- o Portable ventilation units
- o Containment enclosures
- o Special training aids

Involvement in the planning stages of the project permits the Engineering Support group to make realistic man-rem estimates. Initial man-rem estimates for a project are based upon several sources of information:

- o Survey data from previous outages.
- o Comparison of initial man-rem estimates with actual data from other plants which have accomplished similar tasks.
- o Comparison with Hatch Nuclear Plant data for related tasks accomplished in the past.

Man-rem estimates that are developed include an estimate for the entire project, and estimates by task and significant steps in each task. These estimates are routinely updated as information is received. Information and conditions needed by the staff to make man-rem estimates will include:

- o Receipt of current survey data.
- o Information on changes in work procedures.
- o Unexpected tooling or equipment problems.
- o Introduction of effective exposure reduction engineering controls.
- o Changes in man-hour estimates.

## 5.2 Routine Involvement

The Engineering Support staff maintains a continuous involvement in the progress of the projects. Man-rem expenditures for each task and subtask are monitored on a daily basis. The ALARA foreman reviews Radiation Work Permit (RWP) requests and written RWP's prior to issue to ensure the incorporation of ALARA comments and to verify that proposed engineering controls are in place. Health Physics conducts periodic surveillances of work in progress to monitor the effectiveness of techniques proposed and engineering controls utilized and to assure that all data is transferred to the computerized data base. Periodic surveillance also permit the staff to develop additional, or improve existing, exposure reduction methods.

The Engineering Support staff prepares routine reports comparing man-rem expenditure and man-rem estimates. Any discrepancies are analyzed and reasons for discrepancies noted.

The Engineering Support staff should also update the collective occupational dose estimate weekly. If the estimate exceeds the project's man-rem goal by more than 10%, a revised estimate, including reasons for the change, should be drafted for distribution to the Georgia Power Project Manager and the NRC, if required.

## 6.0 DATA MANAGEMENT

In order to properly preplan tasks and to track man-rem tools, a historical data base of task-specific personnel radiation exposures is essential. This data base contains sufficient information to allow:

- o Review of planned work prior to the start of any major outage so as to make recommendations for maintaining exposure ALARA.
- o Evaluation of work in progress or completed in order to establish actual exposures received compared to goals.

If the radiation exposure and task related work permit records system does not allow for each data retrieval, then the required job planning is cumbersome and time consuming.

An automated Health Physics/ALARA records management system has been established. To optimize the utility of such a system, available historical work-related exposure information is present in the computer record file. In addition, a data base suitable for radiation work job planning and creation of historical record files suitable for incorporation into an automated radiological information management system has been established.

This data allows evaluation of worker exposures incurred on project tasks to be categorized by type of workers, work group and job function. Evaluating entry and exit times will allow total man-hours spent on particular tasks to be tabulated. Exposure history is collected by equipment, system, and work function.

During operations, the Engineering Support staff routinely monitors tasks involving exposures to personnel to assure that all required information is transferred to the data base for evaluation by the engineering staff.

#### 7.0 EVALUATION OF PROGRAM EFFECTIVENESS

The Engineering Support staff makes frequent audits of work in progress to monitor program effectiveness in reducing exposures to ALARA levels. In addition, the ALARA Committee reviews program data to determine the effectiveness in meeting ALARA goals. The ALARA program has been very successful. This is demonstrated by data presented in Appendix B.

## APPENDIX B

### Comparison of Plant Hatch and Other Nuclear Power Plants

This appendix is intended to demonstrate the effectiveness of the Plant Hatch ALARA program in reducing the onsite occupational radiation exposures.

Figure B-1 is a plot of the site budgeted and actual man-rem exposure for 1985. The actual man-rem has been maintained well below the budgeted value throughout the year.

Additionally, the results of GPC's commitment to and the effectiveness of the ALARA program is documented by an NRC publication (Ref. 1) regarding historical site exposure data. This data shows that Plant Hatch has one of the lowest accumulated man-rem totals and annual radiation exposure rates of any operating BWR in the United States.

Reference 1: NUREG-0713, Occupational Radiation Exposure at Commercial Nuclear Power Plants, 1983.

FIGURE B-1

1985 E. I. HATCH MAN-REM

