

June 19, 1998

Mr. C. K. McCoy  
Vice President  
Southern Nuclear Operating  
Company, Inc.  
Post Office Box 1295  
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SUBJECT: ENVIRONMENTAL ASSESSMENT RELATED TO RERACKING OF SPENT FUEL  
POOL - VOGTLE ELECTRIC GENERATING PLANT (VEGP), UNITS 1 AND 2  
(TAC NOS. MA0152 and MA0153)

Dear Mr. McCoy:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for license amendments. The proposed action would change the common VEGP Technical Specifications to allow an increase in the Unit 1 spent fuel storage capacity from 288 to 1476 fuel assemblies. The proposed action is in accordance with your application for license amendments dated September 4, 1997, as supplemented by letters dated November 20, 1997, May 19 and June 12, 1998.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY:

David H. Jaffe, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosure: Environmental Assessment

cc w/encl: See next page

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**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

WASHINGTON, D.C. 20555-0001

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Sincerely,

A handwritten signature in black ink, appearing to read "D. Jaffe", written over a circular stamp or mark.

David H. Jaffe, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosure: Environmental Assessment

cc w/encl: See next page

**Vogtle Electric Generating Plant**

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
SOUTHERN NUCLEAR OPERATING COMPANY, INC., ET AL.  
DOCKET NOS. 50-424 AND 50-425  
VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of amendments to Facility Operating License Nos. NPF-68 and NPF-81 issued to Southern Nuclear Operating Company, Inc., et al. (the licensee), for operation of the Vogtle Electric Generating Plant (VEGP), Units 1 and 2, respectively, located in Burke County, Georgia.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would change the common VEGP Technical Specifications to allow an increase in the Unit 1 spent fuel storage capacity from 288 to 1476 fuel assemblies. The increase in spent fuel storage capacity is achieved by replacing the existing spent fuel storage racks, a process referred to herein as "reracking." The proposed action is in accordance with the licensee's application for license amendments dated September 4, 1997, as supplemented by letters dated November 20, 1997, May 19 and June 12, 1998.

The Need for the Proposed Action:

The VEGP spent fuel pools (SFPs) are operated as a single facility and accept spent fuel from both Units 1 and 2. The VEGP Unit 2 spent fuel pool has a storage capacity of 2098 fuel assemblies. Under current conditions, the SFPs will lose the capacity for a full-core off-load (193 fuel assemblies) in the year 2005. There are no independent commercial spent

fuel storage facilities operating in the U.S., nor are there any domestic reprocessing facilities; therefore, the projected loss of storage capacity in the VEGP SFPs would affect the licensee's ability to operate VEGP. The proposed amendments are needed to ensure the capability of full-core off-load until the year 2015.

Environmental Impacts of the Proposed Action:

Radiological Impacts

VEGP has waste treatment systems designed to collect and process waste that may contain radioactive material. The radioactive waste treatment systems were evaluated in the "Final Environmental Statement Related to the Operation of Vogtle Electric Generating Plant," NUREG-1087, March 1985. The SFP cooling and purification system is designed to remove the decay heat generated by stored spent fuel assemblies and to clarify and purify the water to permit unencumbered access to the plant fuel storage area and maintain optical clarity of the SFP water.

Liquid Radioactive Waste

It is not expected that there will be a significant increase in the liquid release of radionuclides from the plant as a result of the SFP reracking modifications. The SFP cooling and purification system operates as a closed system. The SFP demineralizer resin removes soluble radioactive materials from the SFP water. A small increase in activity on the filters and demineralizers may occur during the installation of the new racks because of the more frequent fuel shuffling and underwater pressure washing of the old racks during removal. However, the amount of radioactivity released to the environment as a result of the proposed reracking is expected to be negligible.

### Solid Radioactive Waste

The existing spent fuel racks in the VEGP Unit 1 SFP will be removed from the site by a salvage company. After usable material has been salvaged, the remainder will be volume reduced and disposed of at the Barnwell, South Carolina, facility. In a worst-case scenario, with no salvageable material and no volume reduction, the resulting material would represent 44 percent of the expected solid waste volume associated with VEGP Units 1 and 2 for 1998; however, this volume is not significant when viewed over the 40-year operational lifetime of the VEGP facility.

In addition to the spent fuel assemblies themselves, the only other solid radioactive waste generated by the SFP is the SFP polisher resin, which is used for water clarity. As indicated in the licensee's submittal of September 4, 1997, these resins are replaced approximately once per refueling cycle. No additional spent resins are expected to be generated by the pool cleanup system as a result of the expanded spent fuel storage capability; therefore, no significant increase in the volume of solid radioactive waste associated with these resins is expected with the proposed amendments.

### Radioactive Material Released to the Atmosphere

The only radioactive gas of significance that could be attributable to storing additional spent fuel assemblies for a longer period of time, made possible as a result of the proposed reracking, would be the noble gas radionuclide krypton-85 (Kr-85). Experience has demonstrated that after spent fuel has decayed 4 to 6 months, there is no longer a significant release of fission products, including Kr-85, from stored spent fuel containing cladding defects. The licensee has stated that in the past 2 years, the Kr-85 concentrations measured from the fuel storage area ventilation release point have been negligible and the licensee expects that

enlarging the storage capacity of the SFP will have no effect on the average annual quantities of Kr-85 released to the atmosphere.

Iodine-131 released from spent fuel assemblies to the SFP water will not be significantly increased as a result of the expansion of the fuel storage capacity since the iodine-131 inventory in the fuel will decay to negligible levels between refuelings.

Most of the tritium in the SFP water results from activation of boron and lithium in the primary coolant during power operation. A relatively small amount of tritium is produced during reactor operation by the fission process within the reactor fuel. The subsequent diffusion of the tritium through the fuel and cladding represents a small contribution to the total amount of tritium in the SFP water. Tritium releases from the fuel assemblies occur mainly during reactor operation and, to a limited extent, shortly after shutdown. Thus, expanding the SFP capacity will not increase the tritium concentration in the SFP.

Most airborne releases of tritium and iodine from nuclear power plants result during refuelings from evaporation of reactor coolant, which contains tritium and iodine in higher concentrations than in the SFP. The storage of additional spent fuel assemblies in the SFP is not expected to significantly increase the SFP bulk water temperature, and, therefore, evaporation rates from the SFP are not expected to significantly increase. Consequently, it is not expected that there will be any significant change in the annual release of tritium or iodine as a result of the proposed modifications from that previously evaluated in NUREG-1087.

#### Occupational Doses

The licensee estimates that the increased number of fuel assemblies stored in the Unit 1 SFP may result in a small increase in doses in the areas adjacent to the sides of the SFP, although it will not be enough to change any existing radiation zone designations. To minimize any potential dose rate increases from the increased storage of spent fuel, the licensee plans to

control the placement of freshly discharged fuel so that it is not placed in SFP rack positions adjacent to the sides of the SFP. Dose rates on the fuel pool level are primarily due to radionuclides in the pool water. During normal operations, dose rates in this area are generally 2.5 mrem/hr or less. The staff finds these dose rates to be acceptable and in accordance with SFP dose rates at other plants.

The licensee will constantly monitor the doses to the workers during the reracking operation using electronic personnel dosimetry. Each diver will be monitored using multiple teledosimetry devices. These teledosimetry devices will transmit diver dose and dose rate data that will be continuously monitored adjacent to the SFP. Cameras will be used to monitor the movements of the divers. The licensee will use continuous air samplers when there is a potential for airborne activity in the SFP area during the modifications. In addition, the plant effluent radiation monitoring system will monitor any gaseous releases.

The total occupational dose to plant workers as a result of the reracking operation is estimated to be approximately 4.3 person-rem. This dose estimate is based on the licensee's detailed review of the anticipated work activities, their duration, and expected dose rates associated with each of the activities related to the SFP reracking. The upcoming reracking operation at Vogtle Unit 1 will follow detailed procedures prepared with full consideration of as low as is reasonably achievable (ALARA) principles. On the basis of its review of the proposed action, the staff concludes that the Vogtle Unit 1 SFP rerack modification can be performed in a manner that will ensure that doses to workers will be maintained ALARA. The estimated dose of 4.3 person-rem to perform the proposed SFP rerack is a small fraction of the annual collective dose accrued at Vogtle and, therefore, the staff finds this dose to be acceptable.

### Uranium Fuel Cycle and Transportation

The environmental impacts on the uranium fuel cycle and transportation resulting from the use of higher enrichment fuel and extended irradiation were published in NUREG/CR-5009, "Assessment of the Use of Extended Burnup Fuels in Light Water Power Reactors," February 1988, and discussed in the staff's Environmental Assessment and Finding of No Significant Impact published in the FEDERAL REGISTER on February 29, 1988 (53 FR 6040). The staff concluded that no significant adverse effects will be generated by increasing the burnup levels as long as the maximum rod-average burnup level of any fuel rod is no greater than 60 Gwd/MtU. The staff also stated that the environmental impacts summarized in Tables S-3 and S-4 for a burnup level of 33 Gwd/MtU are conservative and bound the corresponding impacts for burnup levels up to 60 Gwd/MtU and uranium-235 enrichments up to 5 weight percent. Since the proposed amendment does not involve an increase in the enrichment or burnup of fuel utilized at VEGP, the staff concludes that there is no significant radiological environmental impact associated with the proposed expansion of the spent fuel storage capacity at VEGP Unit 1 or with the uranium fuel cycle or transportation.

### Accident Considerations

In the Vogtle Final Safety Analysis Report, the licensee evaluated the possible consequences of the following three hypothetical accidents involving fuel in the SFP: a fuel-handling accident in the fuel-handling building; a fuel-handling accident in the containment with the airlock closed; and a fuel-handling accident in the containment with the airlock open. The licensee reevaluated these hypothetical accidents to determine the thyroid and whole-body doses at the exclusion area boundary, in the low-population zone, and in the control room.

On the basis of the review of the licensee's reevaluation, the NRC staff concludes that the proposed reracking of the Vogtle Unit 1 SFP will not result in an increase in the doses from any of these hypothetical accidents.

Nonradiological Impact

The proposed amendments do not modify land use at the site; no new facilities or laydown areas are needed to support the rerack or operation after rerack; therefore, the proposed amendments do not affect land use or land with historical or archeological sites.

The increased spent fuel inventory results in a minor bulk pool temperature increase. This minor increase in temperature results in a minor increase in the pool water evaporation rate. The licensee's submittal of September 4, 1997, indicates that the effects of the increased temperature and evaporation rates are within the capacity of the existing fuel-handling building heating, ventilation, and air conditioning system. The total heat load from spent fuel cooling dissipated to the environment represents 2.5 percent of the total rejected plant heat.

The proposed action does not affect nonradiological plant effluents, and no changes to the National Pollution Discharge Elimination System permit are needed. The proposed action does not result in any significant changes to land use or water use, or result in any significant changes to the quantity or quality of effluents; no effects on endangered or threatened species or on their habitat are expected.

The proposed action will not change the method of generating electricity or the method of handling any influents from the environment or nonradiological effluents to the environment. Therefore, no changes or different types of nonradiological environmental impacts are expected as a result of the amendments.

Summary

The Commission has completed its evaluation of the proposed action. The proposed action will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released off site, and there is no significant increase in the allowable individual or cumulative occupational or offsite radiation exposure. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does involve features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Since the Commission has concluded there are no significant environmental impacts associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

The proposed action does not involve the use of any resources not previously considered in NUREG-1087.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 26, 1998, the staff consulted with the Georgia State official, Mr. J. Setzer of the Georgia Department of Natural Resources, regarding the environmental impact of the proposed action. The State official had no comments.

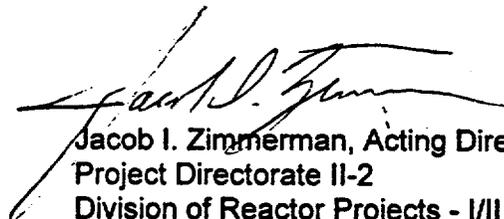
FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated September 4, 1997, as supplemented by letters dated November 20, 1997, May 19 and June 12, 1998, which are available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Burke County Library, 412 Fourth Street, Waynesboro, Georgia.

Dated at Rockville, Maryland, this 19th day of June 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Jacob I. Zimmerman, Acting Director  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation