

Georgia Power Company  
40 Inverness Center Parkway  
Post Office Box 1295  
Birmingham, Alabama 35201  
Telephone 205 992-7122



Georgia Power

*the southern electric system*

LCV-0898

C. K. McCoy  
Vice President, Nuclear  
Vogtle Project

October 21, 1996

Docket Nos. 50-424  
50-425

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT  
GENERIC LETTER 96-04  
BORAFLEX DEGRADATION IN SPENT FUEL STORAGE RACKS

On June 26, 1996, the NRC issued Generic Letter 96-04 and requested addressees submit responses to address concerns related to Boraflex degradation in spent fuel pools. The following is Georgia Power Company's response for the Vogtle Electric Generating Plant (VEGP) to applicable portions of the generic letter.

NRC Request:

(1) 'provide an assessment of the physical condition of the Boraflex, including any deterioration, on the basis of current accumulated gamma exposure and possible water ingress to the Boraflex and state whether a subcritical margin of 5 percent can be maintained for the racks in unborated water.

Monitoring programs or calculational models in effect or being developed, or an estimation of anticipated concerns based on the specific rack design are considered an appropriate basis for this response.'

VEGP Response:

The criticality analysis for the racks in the Unit 2 pool included credit for Boraflex and an allowance for about 2 percent shrinkage; the analysis for the racks in the Unit 1 pool did not include allowance for shrinkage. The accelerated exposure coupons for the Unit 1 racks following the Spring 1996 refueling outage indicated a maximum shrinkage of 3.5 percent in length and 18.56 percent in width. The accelerated exposure coupons for the Unit 2 racks following the Spring 1995 refueling outage indicated a

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maximum shrinkage of 2.5 percent in length. Temporary administrative limits prohibit placement of fuel assemblies with less than 17100 MWD/MTU burnup in storage locations that have previously contained irradiated fuel. Evaluations of the fuel stored in the two spent fuel pools indicated that the 5 percent margin has been maintained when accounting for the burnup of the fuel in the racks. The administrative controls assure that the 5 percent subcriticality margin will be maintained for these amounts of shrinkage, without credit for the soluble boron.

Georgia Power Company recognizes that localized flow, location and other unique factors can affect Boraflex in the Spent Fuel Pool and impact the accuracy of the coupon surveillance. Although the rack cell doses have not been determined, VEGP is assuming that sufficient irradiation has occurred to reach the expected point of some Boraflex deterioration. Water ingress is not prohibited by the VEGP design; however, the design is expected to limit flow of water in the Boraflex panels. The Unit 1 fuel storage pool contains only 288 fuel storage locations. Therefore, the typical cell is more likely to receive freshly discharged fuel assemblies during each refueling of Unit 1. The fuel is then transferred to the Unit 2 fuel storage pool prior to the next Unit 1 refueling outage. The Unit 2 pool contains 2098 storage locations; many of these have never contained irradiated fuel assemblies and have therefore received relatively small doses. Although no attempts have been made to calculate radiation exposure of the Boraflex, this discharged fuel management scheme will result in the Unit 1 Boraflex receiving higher doses.

Rather than develop monitoring programs or calculation models to predict Boraflex performance, Georgia Power Company reperformed the criticality analysis without taking credit for the Boraflex. This analysis was submitted to the NRC with letter LCV- 0849 on October 4, 1996.

#### NRC Request:

(2) 'submit to the NRC a description of any proposed actions to monitor or confirm that this 5 percent subcriticality margin can be maintained for the lifetime of the storage racks and describe what corrective actions could be taken in the event it cannot be maintained.'

#### VEGP Response:

During the NRC's review of the design of the Unit 2 racks, the NRC asked for a description of the corrective actions to be taken if degraded Boraflex specimens or absorber is found in the spent fuel pool. Georgia Power Company letter dated May 5, 1988 described the various options that would be taken, including administrative controls on burnup and fuel storage patterns and credit for the boron in the spent fuel pool.

Georgia Power Company letter LCV-0849 dated October 4, 1996 presented revised criticality analyses that eliminate dependence on Boraflex, and requested Technical Specification changes that take limited credit for soluble boron, burnup and fuel storage patterns. Implementation of this change will assure that the 5 percent subcriticality margin can be maintained for the life of the plant. The NRC was requested to approve this revision to the Technical Specifications by the end of February 1997. The typical boron concentration in the fuel storage pool is about 2400 ppm. It is maintained at this level because of its communication with the reactor system during refueling operations and its potential connection to the refueling water storage tank, which is required by Technical Specifications to be maintained at a concentration above 2400 ppm. This concentration of soluble boron assures that the actual subcriticality margin will remain well above 5 percent, should further Boraflex shrinkage or deterioration occur.

In addition to the above actions, Georgia Power Company plans to supplement or replace the Unit 1 fuel storage pool racks with storage racks containing Boral as a neutron absorber.

NRC Request:

(3) 'describe the results from any previous post operational blackness tests and state whether blackness testing, or other in-situ tests or measurements, will be periodically performed.'

VEGP Response:

The Vogtle Electric Generating Plant has not performed blackness testing and does not have plans to perform blackness or other in-situ testing because the proposed Technical Specifications changes and analyses presented in LCV-0849 will eliminate dependence on Boraflex.

NRC Request:

(4) 'Chronological trends of pool reactive silica levels, along with the timing of significant events such as refuelings, pool silica cleanups, etc., should be provided. Implications of how these pool silica levels relate to Boraflex performance should be described.'

VEGP Response:

Attachment 1 provides Spent Fuel Pool silica data for the VEGP Units 1 and 2 fuel storage pools. The two fuel storage pools are normally interconnected such that the silica levels are similar in each pool.

Georgia Power Company does not believe that accurate correlations can be made as to the actual amount of Boraflex degradation that has occurred relative to silica content of the pool. However, increasing silica does indicate that some degradation of Boraflex has occurred in the VEGP spent fuel pools.

Georgia Power Company recognizes Boraflex degradation as a significant licensing issue and has initiated steps to eliminate it from the VEGP licensing basis. Should the NRC have additional questions concerning the response to this Generic Letter or our request for the elimination of credit for Boraflex, please feel to contact us.

Mr. C. K. McCoy states that he is a 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 and enclosures are true.

**GEORGIA POWER COMPANY**

By:   
C. K. McCoy

Sworn to and subscribed before me this 21<sup>st</sup> day of October 1996.

Attachment

c(w): Georgia Power Company  
Mr. J. B. Beasley, Jr.  
Mr. M. Sheibani  
NORMS

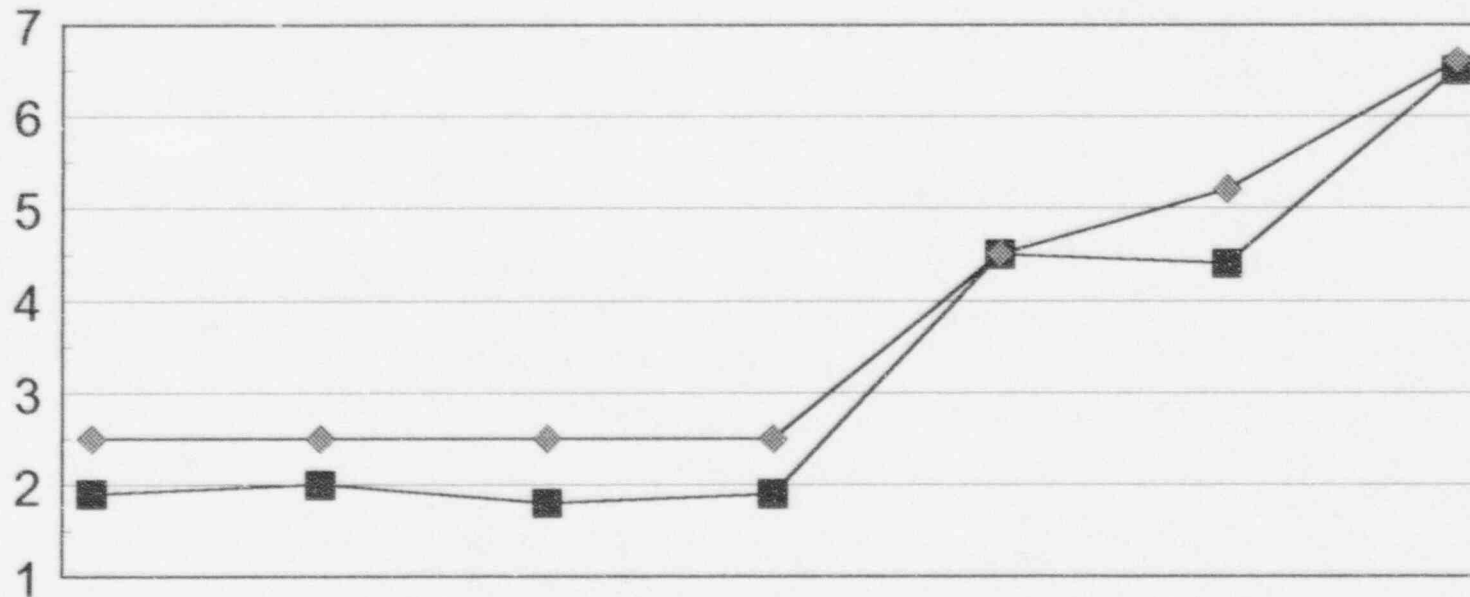
U. S. Nuclear Regulatory Commission  
Mr. S. D. Ebnetter, Regional Administrator  
Mr. L. L. Wheeler, Licensing Project Manager, NRR  
Mr. C. R. Ogle, Senior Resident Inspector, Vogtle



ATTACHMENT 1

# VOGTLE

## SPENT FUEL POOL SILICA

PPM



	7/92(2R2/Spring 92')	7/93(1R4/Spring 93')	2/94(2R3/Fall 93')	9/94(1R5/Fall 94')	4/95(2R4/Spring 95')	12/95(1R6/Spring 96)	7/96(2R5/Fall 96')
Unit 1 	1.9	2.0	1.8	1.9	4.5	4.4	6.5
Unit 2 	2.5	2.5	2.5	2.5	4.5	5.2	6.6