

**Mailing Address**

Alabama Power Company  
600 North 18th Street  
Post Office Box 2641  
Telephone 205 783-6090

**R. P. McDonald**  
Senior Vice President-  
Nuclear Generation  
Flintridge Building



**Alabama Power**  
*the southern electric system*

May 29, 1984

Docket Nos. 50-348  
50-364

Director, Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Mr. S. A. Varga

Joseph M. Farley Nuclear Plant - Units 1 and 2  
Significant Hazards Consideration Analysis  
For Increased Fuel Enrichment Technical  
Specification Change Request

Gentlemen:

By letter dated March 30, 1984, Alabama Power Company requested Technical Specification Changes to authorize use and storage of reload fuel enriched to a maximum of 4.3 weight percent U-235. By letter dated May 10, 1984, the NRC staff requested that Alabama Power Company provide an analysis detailing the reasons and basis for their determination that no significant hazards considerations existed for the proposed changes.

Alabama Power Company hereby submits the attached analysis detailing the reasons and basis for the no significant hazards consideration determination. This letter supplements the Alabama Power Company letter dated March 30, 1984.

In accordance with 10CFR50.91(b)(1), a copy of this letter and its attachment have been provided to Dr. I. L. Myers, the Alabama State Designee.

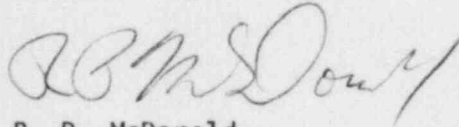
8406050128 840529  
PDR ADOCK 05000348  
P PDR

A001  
1/1

Mr. S. A. Varga  
U. S. Nuclear Regulatory Commission

May 29, 1984  
Page 2

Yours very truly,



R. P. McDonald

RPM/CJS:1sh-D36

Attachment

cc: Mr. L. B. Long  
Mr. J. P. O'Reilly  
Mr. E. A. Reeves  
Mr. W. H. Bradford  
Mr. G. F. Trowbridge  
Dr. I. L. Myers

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 29th DAY OF May, 1984

Sandra Humber  
Notary Public

My Commission Expires: 1-10-87

## ATTACHMENT

### SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS - PURSUANT TO 10 CFR 50.92 FOR THE PROPOSED INCREASED FUEL ENRICHMENT TECHNICAL SPECIFICATION CHANGES

#### PROPOSED CHANGE

Increased the maximum reload fuel enrichment of Technical Specification 5.3.1 and the maximum allowable reload fuel enrichment for the storage of fuel in the new fuel racks of Technical Specification 5.6.1.2 from 3.5 weight percent U-235 to 4.3 weight percent U-235.

#### BACKGROUND

Due to the planned implementation of 18-month fuel cycles and the energy constraints associated with the design of the fuel used in these fuel cycles, increases in the maximum reload fuel enrichment and in the maximum enrichment for new fuel stored in the new fuel storage racks are needed.

With respect to the reload fuel changes, each reload design will be evaluated to confirm that the cycle core design adheres to the safety limits that exist in the current accident analysis and plant Technical Specifications. Therefore, increasing the reload fuel enrichment will have no bearing on the safe operation of the plant.

With respect to increasing the maximum enrichment fuel which can be stored in the new fuel storage racks, a criticality analysis was performed and submitted as an attachment to Alabama Power Company's March 30, 1984 letter. The criticality analysis demonstrates that all applicable NRC licensing criteria for criticality are met for the storage of 4.3 weight percent U-235 fuel in the new fuel storage racks of the Farley Nuclear Plant.

#### ANALYSIS

Alabama Power Company has reviewed the requirements of 10 CFR 50.92 as they relate to the proposed increased fuel enrichment technical specification changes and considers them not to involve a significant hazards consideration. In support of this conclusion, the following analysis is provided:

##### A. Increased Reload Fuel Enrichment

- (1) The proposed change will not significantly increase the probability or consequences of an accident previously evaluated because all applicable safety limits will not change and the specific values for each cycle will be verified to remain within the bounds previously established. In this regard, each reload safety evaluation will compare the cycle specific core peaking factors, kinetic characteristics and other appropriate safety parameters to the assumptions and input values to verify that the cycle core design adheres to the safety limits given in the plant Technical Specifications. Additionally, an analysis of preliminary

loading patterns for Cycles 7 and 8 for Unit 1 indicate that the use of higher enrichment fuel will not violate the current plant Technical Specification limitations. Therefore, the probability or consequences of any accident previously evaluated will not change.

- (2) The proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated because no changes have been made to the plant or the design of the fuel assemblies to accommodate the use of this higher enriched fuel in the core. Additionally, Alabama Power Company has reviewed the appropriate Standards, Codes, Regulatory Guides and the Standard Review Plan to verify that this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.
- (3) The proposed change will not involve a significant reduction in a margin of safety because increasing the reload fuel enrichment will not change the design or safety limits of the plant. Although the operating margins between the cycle specific values and the plant Technical Specifications limits may change (as in each cycle reload), a reduction in the margin of safety will not occur because the safety analysis margins are accommodated in the plant Technical Specification limits, which have not changed.

B. Increased Allowable Enrichment of New Fuel in the New Fuel Storage Racks

- (1) The proposed change will not significantly increase the probability or consequences of an accident previously evaluated because the criticality analysis on the existing racks, which was submitted in Alabama Power Company's March 30, 1984 letter, has shown that the established NRC licensing criteria for criticality have been met (i.e.,  $K_{eff} \leq 0.95$  for dry or flooded conditions and  $< 0.98$  for postulated accidents or optimum moderation conditions). Therefore, the probability or consequences of an accident previously evaluated would not be significantly increased.
- (2) The proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated because this change does not require any changes to the new fuel handling or storage facilities. Additionally, Alabama Power Company has reviewed the appropriate Standards, Codes, Regulatory Guides and the Standard Review Plan to verify that this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.
- (3) The proposed change will not involve a significant reduction in a margin of safety because the criticality analysis has shown that  $K_{eff}$  of the new fuel storage racks is well within the NRC acceptance criteria of 0.95 for dry or flooded conditions and 0.98 for postulated accidents or optimum moderation conditions (i.e., the worst case  $K_{eff}$  was calculated to be  $\leq 0.8883$ ).



CONCLUSION

Based on the reload design and safety evaluation methodology for cycle specific core designs and the new fuel rack criticality analysis, submitted to the NRC March 30, 1984, Alabama Power Company has determined that the proposed technical specification changes for increasing fuel enrichment limits will not increase the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. Therefore, Alabama Power Company has determined that the proposed changes meet the requirements of 10 CFR 50.92(c) and do not involve a significant hazards consideration.