VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 12, 1998

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

Serial No. 98-237
NL&OS/GDM R0
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS NO. 1 AND 2
INCREASED FUEL ENRICHMENT TECHNICAL SPECIFICATIONS CHANGE
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

Virginia Electric and Power Company submitted a proposed Technical Specifications change request to the NRC on November 5, 1997 (Serial No. 97-614) to increase the maximum allowable fuel enrichment from 4.1 to 4.3 weight percent uranium-235. In an April 15, 1998 telephone discussion with Mr. Gordon Edison, the NRC Project Manager for Surry Power Station, we were requested to quantify the impact of the proposed fuel enrichment increase on the decay heat load in the spent fuel pool. Our response to this request is provided in the attachment and concludes that the current spent fuel pool heat load calculations discussed in the Surry UFSAR are conservatively bounding for the fuel management anticipated with a maximum fuel enrichment of 4.3 weight percent uranium-235.

Should you have any further questions or require additional information, please contact us.

Very truly yours,

James P. O'Hanlon
Senior Vice President - Nuclear

A001

Attachment

cc: U. S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

Commitment Summary

To ensure that the current spent fuel pool heat load calculations discussed in the Surry UFSAR remain conservatively bounding for any changes in Surry fuel management, the spent fuel pool decay heat load will be reviewed each cycle as part of our normal reload design process.

Attachment

Response to NRC Question on Impact of Surry Enrichment Increase On Spent Fuel Pool Decay Heat Load

A Technical Specifications change has been requested to increase the maximum fuel enrichment of the Surry fuel from 4.1 weight percent uranium-235 to 4.3 weight percent uranium-235. A change in the fuel enrichment alone will not affect the decay heat load in the spent fuel pool during a full core offload. However, use of fuel with the higher enrichment will allow the batch average discharge burnup of the fuel to increase slightly. Virginia Electric and Power Company has reviewed the anticipated impact of the enrichment increase on the Surry fuel management and the resulting effects on the spent fuel pool heat load.

Immediately after the core offload, the decay heat from short-lived isotopes in the recently discharged fuel represents the major contributor to the spent fuel pool heat load. The production and decay of these short lived isotopes tend to reach an equilibrium condition in the fuel during normal operation, so the concentrations of these isotopes do not change significantly with increasing discharge burnup. Therefore, this contribution to the decay heat load does not change significantly with increasing fuel burnup. With the proposed enrichment increase, there is also a decrease in the number of assemblies discharged each cycle, as well as a decrease in the number of high-power, two-cycle assemblies in the discharge core batch. These fuel management changes actually result in a slight decrease in the calculated heat from the offloaded core.

After a sufficiently long decay period, the longer-lived actinides will provide the major source of decay heat within an individual fuel assembly. These isotope concentrations do increase with fuel burnup, slightly increasing the fuel assembly's decay heat power. However, the contribution from such older fuel to the total spent fuel pool decay heat load is small, particularly for the limiting case discussed in the UFSAR. The effects of the fuel management changes noted above more than compensate for the increase in decay heat due to increased burnup.

As discussed in Section 9.5.3.4 of the Surry UFSAR, the most limiting spent fuel pool heat load occurs when a full core offload of one unit follows a refueling of the other unit. The UFSAR analysis determined a heat load of 40.8×10^6 BTU/hr would be placed on the spent fuel pool cooling system. This spent fuel pool heat load calculation was repeated for the anticipated fuel management scheme that results from the proposed fuel enrichment increase. For the same limiting case described in the UFSAR, the heat load on the spent fuel pool cooling system was calculated to be 38.6×10^6 BTU/hr. It is therefore concluded that the current spent fuel pool heat load calculations discussed in

the Surry UFSAR are conservatively bounding for the fuel management anticipated with a maximum fuel enrichment of 4.3 weight percent uranium-235.

The calculation performed for the higher enrichment is a conservative case, and the results are not expected to differ significantly for variations in the Surry fuel management that may occur with the proposed enrichment limit. However, to ensure that any such changes in Surry fuel management do not affect the applicability of this calculation, the spent fuel pool decay heat load will be reviewed each cycle as part of our normal reload design process.