VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

September 28, 1988

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 88-453
NL/DJV:jmj
Docket No. 50-338
License No. NPF-4

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 1
CYCLE LENGTH EXTENSION

North Anna Unit 1 is currently in its seventh cycle of operation. A reload safety evaluation was performed by Virginia Power for the core design prior to the start of Cycle 7. Based on this evaluation it was determined that the reload did not result in an unreviewed safety question as defined in 10 CFR 50.59, and therefore, NRC approval of the reload was not required. This information was provided to the NRC in our letter of June 3, 1987, Serial No. 87-179A. The purpose of this letter is to request NRC approval of operation of the Cycle 7 core with a maximum fuel rod burnup which is in excess of that previously approved by the NRC. This approval is required as a result of a change in the current fuel cycle length. As discussed in our letter dated September 12, 1988 (Serial No. 88-511), the current fuel cycle has recently been extended to April 1989 in order to fully utilize the fuel in the reactor and to defer operating and maintenance costs associated with the refueling outages.

For the revised Unit 1 fuel cycle, a limited number of fuel rods (approximately 376 fuel rods or 0.9% of the core) will achieve end-of-life (EOL) burnups greater than the burnup value approved by the NRC in their safety evaluation report for WCAP-10125, "Extended Burnup Evaluation of Westinghouse Fuel." The lead rod burnup is projected to exceed the NRC approved burnup value by approximately 2215 MWD/MTU. NRC approval is being requested for operation with fuel rod burnups in excess of the NRC approved limit.

Normal operation of either of the North Anna units would typically not result in fuel achieving such high burnup levels. However, Virginia Electric and Power Company is currently participating in a program with EPRI and Westinghouse to obtain data on fuel rod corrosion at high burnups in high coolant temperature commercial units. As part of this program, eight fuel assemblies are being irradiated for their fourth consecutive 18-month operating cycle in North Anna 1. Four of these assemblies are in peripheral locations, but four have been placed in relatively high power positions to achieve high burnup levels. These high burnup assemblies will achieve assembly average burnups of about 59,100 MWD/MTU under the revised Cycle 7 design. In contrast, typical lead rod average burnups for recent North Anna fuel have been approximately 47,000 to 51,000 MWD/MTU, with batch average discharge burnups of approximately 41,000 MWD/MTU.

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A safety evaluation was performed to assess the impact of operation with fuel burnups in excess of the NRC approved limit. This safety evaluation consisted of a fuel performance evaluation to determine if fuel rod design criteria would be met at the higher burnup, and an evaluation of the impact of the higher burnup on previously analyzed accidents. Based on this evaluation it was concluded that the potential consequences of previously analyzed accidents are not increased by this increase in maximum fuel rod burnup. The fuel performance evaluation is discussed below.

The approved version of Westinghouse's high burnup topical report (WCAP-10125-P-A) includes data from both commercial and test reactor fuel which has operated to rod average burnups beyond the approved burnup limit. The burnup levels of some of this fuel were comparable to those which the North Anna 1 fuel will achieve during Cycle 7. These high burnup data indicated that no sudden or unexpected change in performance occurs in progressing to extended burnups. Therefore, Virginia Electric and Power Company concludes that the Westinghouse fuel performance models and design methods can be extended to the burnups that the North Anna 1 fuel will achieve during this cycle.

Fuel performance calculations have been performed using the Westinghouse fuel performance models for the North Anna fuel, assuming that the unit operates in accordance with the revised outage schedule. These calculations show the fuel rod design criteria described in Section 4.2.1 of the North Anna UFSAR are satisfied to burnups exceeding the proposed maximum fuel rod burnup.

This proposed increase in maximum fuel rod burnup for fuel cycle 7 has been reviewed by the Station Nuclear Safety and Operating Committee and the Safety Evaluation and Control Staff. It has been determined that the increase does not involve an unreviewed safety question as defined in 10 CFR 50.59.

Very truly yours,

W. R. Cartwright
Vice President - Nuclear

cc: U. S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Suite 2900
Atlanta, GA 30323

Mr. J. L. Caldwell
NRC Senior Resident Inspector
North Anna Power Station