

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

June 11, 2003

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

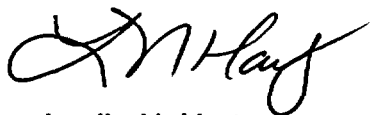
Serial No.	03-314A
NLOS/ETS	R0
Docket Nos.	50-338
	50-339
License Nos.	NPF-4
	NPF-77

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**CLARIFICATION OF ADDITIONAL INFORMATION**  
**PROPOSED TECHNICAL SPECIFICATIONS CHANGES AND EXEMPTION REQUEST**  
**TO USE FRAMATOME ANP ADVANCED MARK-BW FUEL**

In a March 28, 2002 letter (Serial No. 02-167), Virginia Electric and Power Company (Dominion) requested an amendment to Facility Operating License Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, and associated exemptions from 10 CFR 50.44 and 10 CFR 50.46. The amendments and associated exemptions will permit North Anna Units 1 and 2 to use Framatome ANP Advanced Mark-BW fuel. In several telephone calls in March and April 2003 the NRC staff requested additional information to complete the review of the proposed Technical Specification changes for the fuel transition program. The requested information was provided to the NRC in a May 9, 2003 letter (Serial No. 03-314). Subsequently, in a May 22, 2003 telephone conference call, the staff requested further clarification of the difference in the natural frequencies of the two fuel designs. The attachment to this letter provides a discussion of the differences in the natural frequencies of the two fuel designs.

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

Very truly yours,



Leslie N. Hartz  
Vice President - Nuclear Engineering

Commitments made in this letter: None

Attachment

A001

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**Attachment**

**Clarification of Additional Information**

**Framatome Fuel Transition Program  
Technical Specification Change**

**Virginia Electric and Power Company  
(Dominion)  
North Anna Power Station Units 1 and 2**

## **NRC Request for Additional Information – FUEL MECHANICAL DESIGN**

**Q-1. From May 9 submittal page 13 of 17 (Table 1.1) – The data shows that the Mark BW fuel has a frequency that is somewhat greater than the current Westinghouse fuel design. Can we confirm or determine if the dynamic characteristics of the fuel will alter the dynamic characteristics of the reactor internals model and the reactor internal structural response to the SSE and LOCA loadings?**

### **RESPONSE:**

The Reference 1 sensitivity study showed that the upper and lower core plate motions were only negligibly affected by fuel assembly frequency changes (primarily stiffness increases) and minor changes in the weight and center of gravity of the fuel. Most of the motion of the upper and lower core plates results from the reactor vessel motion and some relative motion of the internals (internals motion mainly affects the upper core plate). The horizontal frequency of nozzle-supported reactor vessels are typically about 10 cycles per second (cps) or greater while the core barrel horizontal frequencies are 40 cps or greater. Since the internals are fairly stiff, the frequencies controlling the upper core plate motion are high and thus the upper core plate moves with the vessel with some high frequency relative motion. The lower core plate moves horizontally with the vessel due to its interference fit with the vessel itself.

The fuel frequencies (which are between 2.5 and 3.5 cps) are sufficiently different from the vessel and internals frequencies that they do not couple with these frequencies. Thus if the weight and fuel center of gravity are fairly constant so that the reactor vessel and internals frequencies are unaffected, changes in the fuel frequencies (due to stiffness changes) have very little impact on the upper and lower core plate motions.

From Reference 1, it is concluded that the upper and lower core plate motions used in the faulted analysis are not sensitive to fuel assembly characteristics. This result validates use of the Westinghouse core plate motion data, which were generated assuming cores with Westinghouse fuel.

### **References:**

1. W.D.Maxham, K.F.Bratcher, "Verify RV Internals at N.Anna Negligibly Affected by FRA-ANP vs W-House Fuel", 32-5015157-00, December 2001.