From: Stephen Raul Monarque
To: Ann Sheetz
Date: 10/18/02 9:52AM
Subject: Attached email for Conference Call between staff and VEPCO

MEMORANDUM TO: Tom Shaub, Licensing Manager
Virginia Electric and Power Company

FROM: Steve Monarque, Project Manager
Project Directorate II, Section 1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ASSOCIATED WITH A REQUEST FOR APPROVAL OF TOPICAL REPORT DOM-NAF-1, QUALIFICATION OF THE STUDSVIK CORE MANAGEMENT SYSTEM REACTOR PHYSICS METHODS FOR APPLICATION TO NORTH ANNA AND SURRY POWER STATIONS (TAC NOs. MB5433, MB5434, MB5435, MB5436).

The letter dated June 13, 2002, Virginia Electric and Power Company, the licensee for the North Anna and Surry Power Stations, submitted information requesting approval of a topical report for qualification of the Studsvik Core Management System reactor physics methodology for application at North Anna and Surry Power Stations. The staff has reviewed the information provided and has determined that it needs the following information to complete its review. VEPCO is requested to review this information in support of a conference call.

1. On page 7, paragraph 2, states that the CMS package is used by the nuclear industry in the U.S. and worldwide. What other utilities or vendors use this methodology in the U.S? Has this methodology been reviewed and approved by the NRC for these vendors/utilities?

2. On page 19, paragraph 2, the Doppler defect comparisons were only extended to 4.0 percent enrichment. Why was the comparison not extended to 5.0 percent like the rest of the parameters? Why is this acceptable?

3. On the last two lines of page 20, Table 3, it is stated that the number of observations for the Doppler defect is only three for both North Anna and Surry. This appears to be relatively few observations. Also, the mean percentage difference is large compared to the other mean percentages listed in the same table. Please provide technical justification for these differences.

4. On page 23, paragraph 3, makes a case for "strong gradients increase pin-to-box factors that result in challenging and conservative conditions for both W-prime and pin-to-box uncertainties." Please provide additional clarification of this statement. Does challenging and conservative mean that you have considered worst case scenarios?

5. The last paragraph on page 34, talks about differential rod worth (DRW). It states that SIMULATE tends to over-predict the peak DRW. One presumes that this is a conservative effect. Please provide technical justification for this assumption. Also, please provide additional clarification of the last sentence of the same paragraph.

6. Figure 22, on page 54, shows significant scatter. Please explain how this data supports your statement that the bias is primarily in the middle of the boron range.

7. On page 68, you indicate that SIMULATE's calculated peak F(z) values tend to be low by 0.01 to 0.04. Explain how you account for this tendency when conservatively modeling the transient.

8. On page 68, for the S2C2 Load Follow Demonstration, you indicate that SIMULATE has a critical boron concentration initial bias of -34 ppm. On page 71, for the N1C3 Trip and Return to Power, you do not indicate a bias for the critical boron concentration. On page 75, paragraph 2, for the N1C9 HFP MTC Measurement you indicate that the bias is -24 ppm. On page 82, for the N1C11 Initial Power Ascension, you do not indicate a bias. And on page 86, paragraph 3, for the N2C14 Power Transient, you indicate that the bias is 60 ppm. Describe why these biases vary significantly and why this variation is acceptable. In addition, given the variability of the bias, describe how you account for the bias when using SIMULATE in a predictive capacity.

9. On page 75, you indicate that the Figure 38 SIMULATE boron values followed the measured values within about +18/-15 ppm. However, you only provide four data points for comparison purposes during the power transient. Describe how SIMULATE accurately models this transient given the limited data. Additionally, describe why the +18/-15 ppm assessment is accurate.

10. On page 110, paragraph 2, you state that, "... the remaining 60 pcm standard deviation is assumed to be equally distributed between the Doppler defect and the xenon worth change..." Why is it acceptable to assume the standard deviation can be divided equally between Doppler defect and xenon worth change?

11. On page 114, paragraph 1, you indicate that a value of 1.10 for the Doppler Temperature Coefficient and Doppler Power Coefficient was proposed in Dominion Topical Report VEP-FRD-45A, dated October 1982 and accepted by the U.S. Nuclear Regulatory Commission. Describe why this topical report is still valid given the changes to fuel designs and loading patterns since 1982.

12. On page 115, paragraph 3, you indicate that there are three sets of basic delayed neutron data available in CASMO. Provide clarifications as to which data set you use for your CASMO modeling.