

January 24, 2003

TO: Virginia Electric and Power Company

FROM: Stephen Raul Monarque, Project Manager, Section 1
Division of Licensing Project Management */RA/*
Office of Nuclear Reactor Regulation

SUBJECT: NRC STAFF'S REQUEST FOR ADDITIONAL INFORMATION;
FRAMATOME FUEL TRANSITION, NORTH ANNA POWER
STATIONS, UNITS 1 AND 2 (TAC MB4700, MB4701, MB4714,
AND MB4715)

The NRC staff is providing Virginia Electric and Power Company (VEPCO) a list of questions that will be sent as a request for additional information. VEPCO is requested to review these questions and provide a response date to the NRC staff.

References:

1. Letter, L.N. Hartz, VEPCO, to U.S. Nuclear Regulatory Commission, "...Small Break LOCA Evaluation in Support of Proposed Technical Specifications Changes and Exemption Request Use of Framatome ANP Advanced Mark-BW Fuel," August 2, 2002.
2. Letter, D.A. Christian, VEPCO, to U.S. Nuclear Regulatory Commission, "...Revised LOCA Analysis Schedule in Support of Proposed Technical Specifications Changes and Exemption Request Use of Framatome ANP Advanced Mark-BW Fuel," November 15, 2002.

In your letter dated November 15, 2002 (Ref. 2), you withdrew requests for NRC review of Minimum Containment Pressure (July 9, 2002), REFLOD3B Carryout Rate Fraction (July 25, 2002), and Large Break LOCA Analysis (August 16, 2002). In the November 15, 2002 letter, you also clarified that the August 16, 2002 letter is not applicable to the current fuel product at North Anna and should not be employed to draw conclusions regarding the current operation or ECCS performance of the North Anna Units. The staff acknowledges these withdrawals and confirms that it draws no conclusions from the August 16, 2002, letter, per your request.

In the November 15, 2002, letter, you also committed to:

1. Reanalyze the large break LOCA (LBLOCA) for North Anna Units 1 and 2 using the Framatome ANP realistic LBLOCA methodology, following generic approval of that methodology, and that VEPCO expected to complete the reanalyses by April 30, 2003.
2. Reanalyze the small break LOCA (SBLOCA) for North Anna Units 1 and 2, with the analyses to be completed by April 30, 2005.

The staff acknowledges these commitments and finds the Item 1 proposed schedule acceptable for both fuel types.

The staff acknowledges and finds the Item 2 schedule acceptable for the present North Anna fuel. However, the schedule is unacceptable for the Framatome ANP Advanced Mark-BW Fuel, as discussed below.

In connection with Item 2, you requested that the NRC staff review your August 2, 2002, letter (Reference 1). We have reviewed the proposed method of addressing SBLOCA requirements for North Anna Units 1 and 2 with cores containing Framatome ANP Advanced Mark-BW Fuel. We find the approach unacceptable because it does not provide the quantification necessary to benchmark the Framatome ANP Advanced Mark-BW Fuel to determine which fuel is limiting for SBLOCA, to demonstrate that North Anna has a licensing basis analytical SBLOCA methodology capable of evaluating Framatome ANP Advanced Mark-BW Fuel, and to provide analyses of record for the Framatome ANP Advanced Mark-BW Fuel as a baseline for ECCS reporting per 10 CFR 50.46 (a)(3)(i and ii). For these purposes, VEPCO must perform explicit SBLOCA analyses of Framatome ANP Advanced Mark-BW Fuel, prior to operation with that fuel.

While the staff finds above reasons sufficient to find the proposed approach unacceptable, our review also raised other issues you most likely could only resolve with explicit quantitative analyses using a SBLOCA methodology approved for both North Anna and the fuel types involved. These items are provided in the attachment.

ADAMS: ML030270112

ATTACHMENT
Technical Concerns Regarding the VEPCO August 2, 2002
SBLOCA Analysis Proposal

A. General Comments

1. The VEPCO letter cites a 1991 Trojan reload report and a 1992 Catawba/McGuire reload report as precedent for its qualitative proposal. Neither of these reports is an acceptable reference because:
 - a. The Mark-BW and Westinghouse OFA fuels involved had greater similarity than the advanced fuels discussed in the August 2 letter.
 - b. The Trojan and Duke proposals were supported by mixed-core analyses to provide quantitative confirmation, whereas the August 2 letter did not.
 - c. Both Framatome and Westinghouse methodologies have changed in the last 10 years. Comparisons performed long ago using different codes do not necessarily apply to the North Anna situation and its licensing basis analyses performed with the present code.
2. The VEPCO letter does not provide results of sensitivity studies to identify which fuel is limiting.
3. The VEPCO methodology currently contains a number of changes and errors with a cumulative significant uncertainty.
 - a. It is not clear that the present analyses bound the LOCA performance of both fuels.
 - b. It is not clear which fuel is bounding once the uncertainties are factored in.
 - c. It is not clear that a mixed-core penalty would be validly calculated with an un-updated model.

B. Specific Concerns

4. Pg 2 of 5 "The suppression of core steam production further depressurizes the RCS."
 - a. It seems that, all else being equal, pressurization of the RCS would also suppress steam production. This, combined with the quoted statement would lead to the conclusion that the pressurization of the RCS depressurizes the RCS. The quoted statement is confusing.
 - b. The discussion needs a clearer description.
5. Pg 3 of 5, Par 2, last 2 sentences. If the Advanced Mark-BW fuel is somewhat cooler near the MSMGs than the NAIF, then isn't the NAIF somewhat hotter as a result, and the present calculations no longer bounding?
6. Pg 3 of 5, Par 3, regarding actual versus design flow. The design flow is lower than the actual flow to accommodate uncertainties in actual flow, not errors in design flow. In either event the design flow must always be lower than the actual flow to assure that the analyses are conservative. This paragraph only assures that one design parameter is correctly specified; it isn't clear that it supports the conservatism of the treatment of Advanced Mark-BW fuel. Does it indicate that the RCS flow Tech Spec should be higher?

7. Pgs 3 and 4 of 5 regarding swelling and rupture. If NAIF ruptures sooner than Advanced Mark-BW fuel, might it also swell at a different rate? If so, the resulting effect on PCT could alter the estimated PCTs for both fuels.