VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

July 6, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Serial No. 726C
GLD/RWC:cdk:0556C
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

SUPPLEMENT TO AMENDMENT TO OPERATING LICENSES NPF-4 AND NPF-7
NORTH ANNA POWER STATION UNIT NOS. 1 AND 2
REACTOR COOLANT SYSTEM TEMPERATURE OF 587.8°F

In our letter dated December 30, 1982 (Serial No. 726), Vepco requested an amendment to Operating Licenses NPF-4 and NPF-7 to allow operation of North Anna Unit Nos. 1 and 2 at a reactor coolant system average temperature of 587.8°F. This letter provides in Attachment 1 supplemental information in answer to questions discussed with members of the Staff's Core Performance Branch on May 9, 1983 and June 15, 1983.

Should you have any questions, please contact us at your earliest convenience.

Very truly yours,

W. L. Stewart

Attachment

(1) Response to Core Performance Branch
Question for North Anna 7.5°F Tavg Increase

cc: Mr. James P. O'Reilly
Regional Administrator
Region II

Mr. George Schwenk
Core Performance Branch

Mr. M. B. Shymlock
NRC Resident Inspector
North Anna Power Station

Mr. Charlie Price
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109 Governor Street
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ATTACHMENT 1

RESPONSE TO CORE PERFORMANCE BRANCH QUESTION

FOR NORTH ANNA 7.5^{o}F T-AVG INCREASE

ATTACHMENT 1

RESPONSE TO CORE PERFORMANCE BRANCH QUESTION
FOR NORTH ANNA 7.5°F TAVG INCREASE

1. NRC Question

"Confirm that the applicable range for the key parameters in the W-3 DNBR correlation bounds the conditions expected after the 7.5°F increase in Tavg.

2. Response

The Range of the key parameters associated with the W-3 correlation, the R-grid factor, the cold wall factor and the non-uniform heat flux multiplier are included in Table 1. These are supported by the references also indicated in Table 1. These ranges bound the operating conditions present in the Condition II and III DNB transients which were reanalyzed at the uprated conditions. Table 2 presents the 7.5° uprating design conditions, which are well within the W-3 correlation range of applicability.

TABLE 1: W-3 CORRELATION LIMITS

CORRELATION	REF. NO.	PRESSURE RANGE (psia)	MASS VELOCITY (Mlb/h-f^2)	EQUIV. DIAMETER (in.)	LOCAL QUALITY	AXIAL HEIGHT (in.)	INLET TEMP. (^oF)
W-3	1,2	1000-2400	1.0-5.0	0.2-0.7	$\leq$0.15	10-144	>400
F-factor	1,2	1000-2400	1.0-3.0	0.2-0.7	$\leq$0.15	10-144	
Coldwall Factor	1,2 3,4	1000-2400	1.0-5.0		$\leq$0.15	>10	
Spacer Factor	3,4	1490-2440	1.5-3.7		$\leq$0.15	96-168	404-624

TABLE 2: CORE CONDITION WITH 7.5^oF TAVG INCREASE

core inlet temp. (^oF)	555.5
mass velocity (mlb/h-f^2)	2.442
pressure (psia)	2250

References:

1. E. R. Rosal, J. O. Cermak, L. S. Tong, J. E. Casterline, S. Kokolis, and B. Matzer, "High Pressure Rod Bundle DNB Data with Axially Non-Uniform Heat Flux," Nuclear Engineering and Design Vol. 31 (1974), No. 1, pp. 1-20 (see Appendix B)

2. L. S. Tong, "Boiling Crisis and Critical Heat Flux," U. S. AEC Critical Review Series, 1972.

3. F. F. Cadek, F. E. Motley, "Application of Modified Spacer Factor to L-Grid Typical and Cold Wall Cell DNB," WCAP-8030-A, January 1975.

4. F. F. Cadek, F. E. Motley, "DNB Test Results for R-Grid Thimble Cold Wall Cells," WCAP-7958 Add. 1, January 1975.