VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

September 29,1983

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

Serial No. 480
PSE/RCA/ses/0005N
Docket Nos.: 50-338
50-339
License Nos.: NPF-4
NPF-7

Gentlemen:

AMENDMENT TO OPERATING LICENSES NPF-4 AND NPF-7
NORTH ANNA POWER STATION UNIT NOS. 1 AND 2
PROPOSED TECHNICAL SPECIFICATION CHANGE

Pursuant to 10CFR50.90, the Virginia Electric and Power Company requests an amendment, in the form of changes to the Technical Specifications, to Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station Units 1 and 2.

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 the North Anna Units Nos. 1 and 2 at a reactor coolant system average temperature of 587.8°F. This submittal was based upon the then-current Technical Specifications which included a $F^N_{\Delta H}$ fractional thermal power multiplier of 0.2. Vepco proposes to change the $F^N_{\Delta H}$ fractional thermal power multiplier from 0.2 to 0.3 for 587.8°F operation in order to restore the benefit obtained from the recent approval of a 0.3 multiplier at the current plant average temperature of 582.8°F. Enclosure 1 provides the Safety Evaluation for the proposed changes. These changes will allow optimization of the core loading patterns and provide additional operating flexibility. Minor changes to the core thermal limits and $f(\Delta I)$ function are required to implement the change. The resulting specific Technical Specification changes are given in Enclosure 2.

This request has been reviewed and approved by the Station Nuclear Safety and Operating Committee and the Safety Evaluation and Control Staff. It has been determined that this request does not involve any unreviewed safety questions as defined in 10CFR50.59 or a significant hazards consideration as defined in 10CFR50.92.

A001
1/1

Rec'd w/check
$ 4,400

We have evaluated this request in accordance with the criteria in 10CFR170.22. Since this request involves a safety issue which the Staff should be able to determine does not involve a significant hazards consideration for Unit No. 1 and a duplicate safety issue for Unit No. 2, a Class III license amendment fee and a Class I license amendment fee are required for Unit No. 1 and Unit No. 2, respectively. A voucher check in the amount of $4,400.00 is enclosed in payment of the required fee.

Very truly yours,

W. L. Stewart

W. L. Stewart

Enclosure
(1) Safety Evaluation for Proposed $F^N_{\Delta H}$ Changes
(2) Proposed Technical Specifications Changes
(3) Voucher Check for $4,400

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

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

Mr. Charles Price
Department of Health
109 Governor Street
Richmond, Virginia 23219

COMMONWEALTH OF VIRGINIA)
)
CITY OF RICHMOND)

The foregoing document was acknowledged before me, in and for the City and Commonwealth aforesaid, today by W. L. Stewart who is Vice President - Nuclear Operations, of the Virginia Electric and Power Company. He is duly authorized to execute and file the foregoing document in behalf of that Company, and the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 29th day of September, 19 83.

My Commission expires: 2-26, 19 85.

Ann C. McSee
Notary Public

(SEAL)

S/001

ENCLOSURE 1

SAFETY EVALUATION FOR A REVISED $F^N_{\Delta H}$ PART POWER MULTIPLIER FOR NORTH ANNA UNITS 1 AND 2 OPERATION WITH A RCS TAVG OF 587.8°F

Historically, increasing the allowable $F^N_{\Delta H}$ with decreasing power has been permitted for all previously approved Westinghouse designs. The increase is permitted by the DNB protection setpoints and allows for radial power distribution changes with rod insertion to the insertion limit. The NRC has previously approved[1] a change from a part power multiplier of 0.2 to a multiplier of 0.3 for a RCS average temperature of 582.8°F in the North Anna Technical Specifications.[2-3] However, the proposed license amendment[4] to allow operation at a reactor coolant system average temperature of 587.8°F was submitted prior to the NRC approval and assumed a 0.2 $F^N_{\Delta H}$ part power multiplier.

The results of the North Anna $F^N_{\Delta H}$ Technical Specification limit analysis, consistent with the 587.8°F Tavg conditions, indicate that the limit may be modified by changing the limit slope from 0.2 to 0.3 at reduced power, resulting in the following relationship:

$$F^N_{\Delta H} = 1.55[1.0 + 0.3(1-P)]$$

where P is the fraction of rated thermal power. Note that the only change from the $F^N_{\Delta H}$ expression incorporated in the Reference 4

analyses is the change in the multiplier on the quantity (1-P) from 0.2 to 0.3; no change is made in the $F^N_{\Delta H}$ limit at full power.

This change is requested for North Anna to allow optimization of the core loading pattern by minimizing restrictions on $F^N_{\Delta H}$ at low power. This change will also minimize the probability of making rod insertion limit changes to satisfy peaking factor criteria at low power with the control rod banks at the insertion limit. Figures 1 and 2 show the calculated values of $F^N_{\Delta H}$ versus core power for North Anna Unit 1 Cycle 4 and North Anna Unit 2 Cycle 3, compared to the current and proposed Technical Specification limits on $F^N_{\Delta H}$.

The North Anna core thermal limits and axial offset limits for an increased allowable $F^N_{\Delta H}$ at reduced power levels were determined using Vepco's version of the COBRA code[5] and the standard Westinghouse methodology. The core thermal limits only have minimal changes because at most conditions below full power, the restriction that the average enthalpy at the vessel exit be less than the enthalpy of saturated liquid is more limiting than DNB considerations. The vessel exit enthalpy limit is not core peaking factor dependent.

The overtemperature and overpower ΔT K1, K2, K3, K4, K5 and K6 factors given in the Technical Specifications were recalculated based on the new core thermal limits using the Westinghouse

setpoint methodology.[6] The analysis resulted in minor changes to these factors as can be seen in Enclosure 2. However, since the K1 term increased slightly, confirmatory analyses were performed which verified that the revised constants and resulting setpoints are appropriate. These consisted of evaluating the rod-withdrawal-at-power transient over a bounding range of reactivity insertion rates. This transient represents the bounding transient with respect to these setpoints.

As a result of our analyses, we have determined that the modification of the $F^N_{\Delta H}$ fractional power multiplier from 0.2 to a value of 0.3 does not result in an unreviewed safety question as defined in 10CFR50.59. In addition, the change does not involve a significant hazards consideration. There is a relaxation in the allowable $F^N_{\Delta H}$ with decreasing power; however, this is compensated for by more restrictive core thermal limit lines which enable a commensurate level of safety to be maintained. Appropriate Technical Specifications changes are provided in Enclosure 2.

References

1. Letter from L. B. Engle (NRC) to W. L. Stewart (Vepco), "Amendment Nos. 46 and 29 to the North Anna Units 1 and 2 Operating License", dated April 22, 1983.

2. "North Anna Power Station Unit 1 Technical Specifications", Appendix "A" to License No. NPF-4, Issued by the U. S. Nuclear Regulatory Commission (November 26, 1977).

3. "North Anna Power Station Unit 2 Technical Specifications", Appendix "A" to License No. NPF-7, Issued by the U. S. Nuclear Regulatory Commission (April 11, 1980).

4. Letter from W. L. Stewart (Vepco) to H. R. Denton (NRC), Ser. No. 726, "Amendment to Operating Licenses NPF-4 and NPF-7 North Anna Power Station Unit Nos. 1 and 2 Proposed Technical Specifications Change" dated December 30, 1982.

5. Sliz, F. W.: "Vepco Reactor Core Thermal-Hydraulic Analysis using the COBRA-IIIC/MIT Computer Code", VEP-FRD-33, Virginia Electric and Power Company (August 1979).

6. Ellenberger, S. L., et al.: "Design Basis for the Thermal Overpower delta-T and Thermal Overtemperature delta-T Trip Functions", WCAP-8745 (proprietary), Westinghouse Nuclear Energy Systems (March 1977).

FIGURE 1

NORTH ANNA UNIT 1 CYCLE 4
CONSERVATIVE CALCULATION OF ENTHALPY RISE FACTOR
WITH POWER LEVEL AND
TECHNICAL SPECIFICATION LIMITS

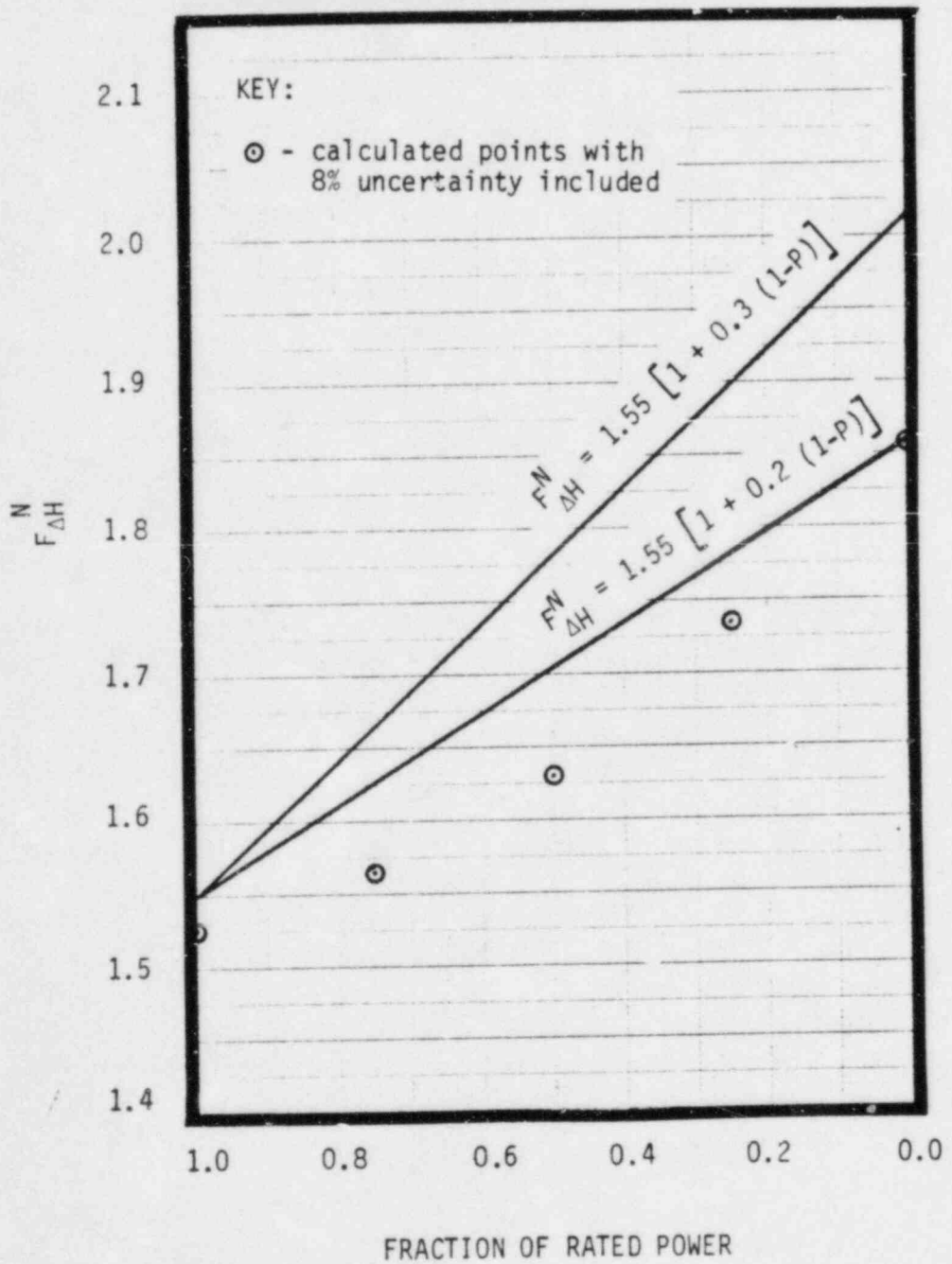
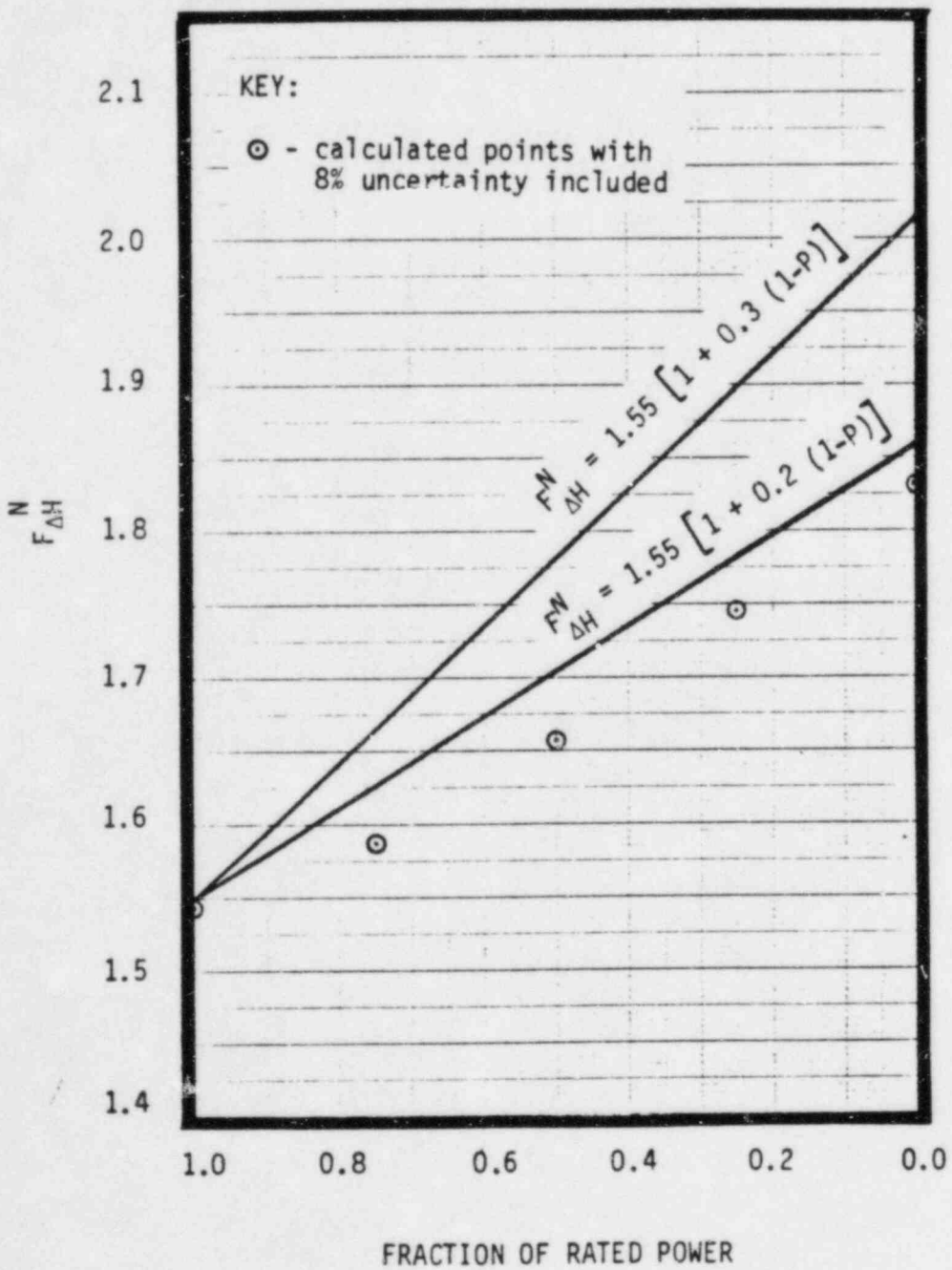


FIGURE 2

NORTH ANNA UNIT 2 CYCLE 3
CONSERVATIVE CALCULATION OF ENTHALPY RISE FACTOR
WITH POWER LEVEL AND
TECHNICAL SPECIFICATION LIMITS



ENCLOSURE 2