NRC FORM 195 (2-76) U.S. NUCLEAR REGULATORY COMMISSION

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TO: Mr Rusche	FROM: VEPCO Richmond, Va C M Stallings	DATE OF DOCUMENT 8-26-76 DATE RECEIVED 8-31-76
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DESCRIPTION

Ltr re Westinghouse to VEPCO ltr dtd 8-5-76 .....trans the following:

ENCLOSURE

Info concerning unreviewed safety issues with regard to ECCS & DNBR.....

PLANT NAME: Surry 1 & 2

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NRC FORM 195 (2-76)

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

August 26, 1976

Mr. Benard C. Rusche, Director
Office of Nuclear Reactor Regulation
Attn: Mr. Robert W. Reid, Chief
Operating Reactors Branch No. 4
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 211
FR/JTR:agp

Docket Nos. 50-280
50-281

Dear Mr. Rusche:

On August 5, 1976, the Virginia Electric and Power Company (Vepco) was informed by the Westinghouse Electric Corporation of two unreviewed safety questions with potential impact on the operation of Surry Units 1 and 2. These unreviewed questions are concerned with the impact of higher upper head fluid temperatures on the Loss of Coolant Accident ECCS Analysis and a greater than anticipated effect on DNBR of fuel rod bowing in thimble cells. An evaluation of these concerns and their potential impact on the operation of Surry Units 1 and 2 was conducted by Vepco, and on August 6, 1976, voluntary reductions in all hot channel peaking factor limits were put into effect. Notification of these actions was then provided to the U. S. Nuclear Regulatory Commission (NRC).

On August 13, 1976, additional guidance on an interim mechanism for conservatively accommodating any potential impact from the above concerns was informally received from the NRC Staff. Evaluations were then performed to determine the appropriate limits on the operation of Surry Units 1 and 2 consistent with the guidance received from the Staff. These evaluations and associated operating limits were reviewed with the Staff on August 16, 1976, and were formally submitted, as required, on August 18, 1976, in our letter Serial No. 194.

On August 24, 1976, the Staff informed us that our evaluation and associated limits for the impact of higher upper head fluid temperature on the Surry LOCA/ECCS were not acceptable. During further discussions on August 25, 1976, the Staff informed us that the reason the evaluation was unacceptable was that it did not contain sufficient information to confirm that the most conservative value of the discharge coefficient (C_D) was used, notwithstanding our specific discussion on this point on August 16, 1976, and the fact that we addressed and justified our position on this point directly in our August 18, 1976, submittal. The Staff further indicated that until confirmatory analyses could be submitted, reviewed, and approved, an additional penalty of 0.05 on the F_Q limits contained in our August 18, 1976, submittal would be required.

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Our position on this matter is that our evaluations and associated limits contained in our August 18, 1976, submittal are technically correct and complete; however, we will accept the Staff's position until confirmatory analyses can be approved. Accordingly, we have revised the operating limits contained in our August 18, 1976, submittal. These limits are contained in Attachment 1 to this letter.

Very truly yours,

C. M. Stallings
Vice President-Power Supply
and Production Operations

Attachment

cc: Mr. Norman C. Moseley, Director
Office of Inspection and Enforcement
Region II

The limiting values of the following power distribution parameters shall be changed:

a. heat flux hot channel factor, $F_Q(Z)$

b. enthalpy rise hot channel factor, $F^N_{\Delta H}$, and

c. quadrant power tilt ratio.

The heat flux hot channel factor, $F_Q(Z)$ shall be limited to the following values:

For Unit 1

$F_Q(Z) \leq (1.80/P) \times K(Z)$ for $P > 0.5$

$F_Q(Z) \leq (3.60) \times K(Z)$ for $P \leq 0.5$

For Unit 2

$F_Q(Z) \leq (1.82/P) \times K(Z)$ for $P > 0.5$

$F_Q(Z) \leq (3.64) \times K(Z)$ for $P \leq 0.5$

where P is the fraction of rated power at which the core is operating, K(Z) is the function given in Figure 1, and Z is the core height location of $F_Q(Z)$. Additionally, the limiting behavior of $F_Q(Z)$ for nominal transient operation of each unit shall be periodically evaluated. If this evaluation shows that $F_Q(Z)$ could potentially violate its limiting values either:

a. reactor thermal power shall be reduced appropriately in order to accomodate this potential violation, or

b. APDMS type surveillance shall be performed to directly monitor $F_Q(Z)$.

The enthalpy rise hot channel factor, $F^N_{\Delta H}$, shall be limited to the following values:

$$F^N_{\Delta H} = 1.55\{1 + 0.2(1-P)\} \times T(BU)$$

where P is the fraction of rated power at which the core is operating and T(BU) is the thimble cell penalty on $F^N_{\Delta H}$, which is given in Figure 2.

The quadrant power tilt ratio shall be limited to values < 1.02.

ATTACHMENT 1

CHANGES TO LIMITING VALUES OF POWER DISTRIBUTION PARAMETERS FOR CYCLE 3 OPERATION OF SURRY UNITS NO. 1 AND 2 AS THE RESULT OF HIGHER UPPER HEAD FLUID TEMPERATURES AND THIMBLE CELL ROD BOW EFFECT

Figure 1

HOT CHANNEL FACTOR NORMALIZED
OPERATING ENVELOPE

SURRY POWER STATION
UNITS NO. 1 AND 2

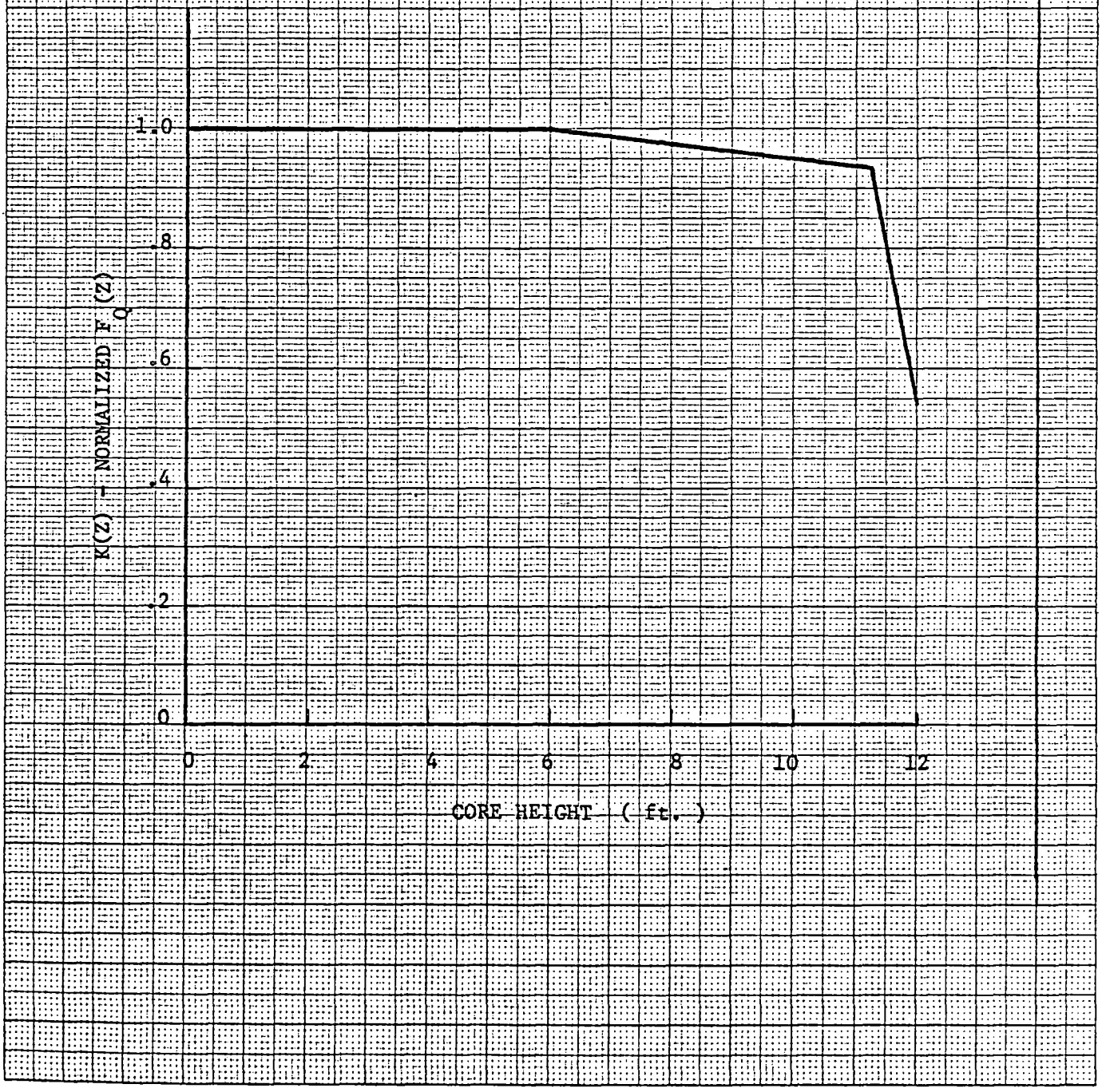

FIGURE 2

THIMBLE CELL PENALTY
ON $F^N_{\Delta H}$
SURRY POWER STATION
UNITS NO. 1 AND 2