VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

August 9, 1977

Mr. Edson G. Case, Acting Director
Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 325A
PO&M/ALH:das
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Attention: Mr. Robert W. Reid, Chief
Operating Reactors Branch 4

Dear Mr. Case:

The purpose of this letter is to provide additional information as requested by the NRC staff regarding our request for extended operation of Surry Unit No. 2. In our previous letter serial no. 325 we presented information showing that a large number of tube failures would be required before 10CFR100 dose limits would be exceeded during a steam line break (SLB) transient. Although these high primary to secondary leak rates can be tolerated from the standpoint of site boundary dose, other affects such as DNBR may dictate a more limiting primary to secondary leak rate. Ten gallons per minute (10 GPM) will be used as a limit to evaluate continued operation of Surry Unit No. 2 since this is the maximum value of total primary leakage permitted by technical specifications.

We have previously established that during a SLB, an existing .3 GPM leak will increase to a maximum of .78 GPM. We have also established that only tubes with 85%-100% through wall flaws will crack through during the SLB. These tubes would then leak at .05 GPM each during the remainder of the transient. Based on these facts, approximately 184 tubes would have to crack through and leak during a SLB before the total primary to secondary leak rate would exceed 10 GPM.

In our letter serial no. 353B/113076 dated March 21, 1977, we presented information showing that the growth of strain contours in the range of .08 in/in to .12 in/in (the range in which over 90% of the leaking tubes have occurred) is about ½ tube row per month in the region of the strain boundary. This means that the tubes adjacent to the present plugging pattern in Surry Unit No. 2 will be at least partially subject to strains of .08 in/in to .12 in/in during the requested period of additional operation. Our inspection shows that 2A steam generator (worst case) has approximately 140 tubes adjacent to the present plugging pattern. If we assume that half of these tubes sustain partial through wall flaws in the 85%-100% range during the period of extended operation, and that a .3 GPM leak already exists; then the expected total primary to secondary leak rate during a SLB would be 4.28 GPM. This provides sufficient margin to allow an additional 114 tubes to crack and leak before a 10 GPM primary to secondary leak rate is achieved. If a 10 GPM primary to secondary leak rate were experienced during a SLB, the loss of coolant inventory would be trivial at the time the core thermal transient is terminated. Previous analyses show that the SLB core transient is terminated in less than one minute by the safety injection system. The 10 gallon additional inventory loss imposed by primary to secondary leakage is intuitively

insignificant since this represents less than .02% of total reactor coolant volume. Therefore, we do not believe that DNBR is affected by 10 GPM primary to secondary leakage during SLB.

Since the expected leak rate during SLB is acceptable from the standpoint of dose considerations and core performance, we believe that the health and safety of the general public will not be affected by continued operation of Surry Unit No. 2 through September 15, 1977.

Very truly yours,

C. M. Stallings

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

cc: Mr. James P. O'Reilly