



VIRGINIA ELECTRIC AND POWER COMPANY, RICHMOND, VIRGINIA 23261

March 8, 1979

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
Attention: Mr. O. D. Parr, Chief  
Light Water Reactors Branch No. 3  
Division of Project Management  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Serial No. 237D  
PSE&C/RLR:adw:mc  
Docket Nos. 50-338  
50-339  
License No. NPF-4

Dear Mr. Denton:

A comprehensive test to evaluate the thermal performance and water inventory characteristics of the North Anna Service Water Reservoir and spray system was conducted in July and August, 1978. The results of this test were used to verify the predictive capabilities of complex analytical models which evaluate the thermal performance and water inventory capabilities of the system. We are submitting ten (10) copies of the final report on the testing and performance evaluation of the North Anna Service Water Reservoir (SWR) and spray system with this letter (see Attachment 1). This report is entitled "Service Water Reservoir and Spray System Performance Testing and Evaluation".

Two independent consultants were utilized for the acquisition of test data and the data analyses/system modeling tasks. Environmental Systems Corporation was responsible for all data acquisition during the testing of the SWR and spray system. Ford, Bacon & Davis Utah Inc. (FB&DU) was responsible for final data reduction and analyses as well as system modeling at design conditions. A report on the procedures and instrumentation used in the testing of the SWR and spray system was submitted in September, 1978. This report was entitled "The North Anna Power Station Ultimate Heat Sink, Interim Report of Design Verification Testing."

The final report contains some information relating to direct test measurements of the thermal efficiency of the SWR spray system. Vepco considers this information proprietary and requests that this information be withheld under 10CFR2.790. An affidavit to this effect is included as Attachment 2. Also our consultant FB&DU considers the results of their proprietary computer modeling techniques as being proprietary under 10CFR2.790. This information is addressed separately in Attachment 3.

Those portions of the report whose proprietary nature is explained in Attachment 2 are enclosed in brackets with a ① superscript - i.e.: [proprietary material]① Those portions of the report whose proprietary nature is explained in Attachment 3 are enclosed in brackets with a ② superscript - i.e.: [proprietary material]② Those portions of the report whose proprietary nature is explained both in Attachment 2 and Attachment 3 are enclosed in brackets with a ③ superscript - i.e.: [proprietary material]③

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Figure 1 of Attachment 4 is considered proprietary and is not provided. However, this figure is completely analogous to Figure 4.4 of Attachment 1 with a peak temperature of 110 F.

The final report utilizes complex modeling techniques to ascertain the maximum Service Water temperatures which could be expected under design basis plant and meteorological conditions. This maximum SWR temperature was found to be 107.7 F for four-unit operating conditions.

Stone & Webster Engineering Corporation has performed a review of all plant safety systems on Units 1 and 2 which would be affected by increased Service Water temperatures for design basis conditions. The conclusions of this review are presented in Attachment 4. In summary, all Units 1 and 2 systems are now acceptable for operation with 110.0 F inlet Service Water with 3 exceptions:

1. Modifications are required to charging pump coolers and associated Service Water piping to provide adequate flow for design basis conditions.
2. Modifications are required to guarantee the operability of the control room air-conditioning chillers for Service Water inlet temperatures in excess of 110.0 F.
3. Piping and pipe supports in the Service Water and Component Cooling Water Systems are being reanalyzed and will be modified if required. The temperature limits considered in this effort are stated in our letter Serial No. 656B dated January 26, 1979, to Mr. James P. O'Reilly, Director of the Office of Inspection and Enforcement, Region II.

It is our intent to complete the modifications required in items (1) and (2) prior to Unit 2 fuel load. Work is proceeding on item (3), and you will be notified as to the resolution of this item in the near future. This notification will be in the form of a final report as required under the provisions of 10CFR50.55(e).

The design Service Water Temperatures for Units 3 and 4 will be modified as a result of the analyses presented in this report. All Service Water and Component Cooling Water systems will be reanalyzed as required using 110.0 F as the maximum Service Water inlet temperature. Any modifications required for either Unit 3 or Unit 4 will be completed prior to their respective fuel load dates. The Units 3 and 4 Service Water and Component Cooling Water piping and supports will be reanalyzed using the same temperature limits as Units 1 and 2.

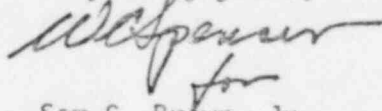
The submission of this report fulfills commitments made in our letters Serial No. 610 dated December 28, 1977, and Serial No. 396, dated July 13, 1978, to Mr. James P. O'Reilly, Director of the Office of Inspection & Enforcement, Region II.

In summary, the North Anna Service Water Reservoir and spray system has been tested and the results used to verify the conservatism of analytical models of the system. These models were then used to evaluate the thermal performance and water inventory characteristics of the system for 4 unit design basis conditions. Some system modifications were indicated as a result of these evaluations. These modifications are now in progress on Units 1 and 2. Studies will be performed on the Units 3 and 4 Service Water and Component Cooling Water Systems to identify any modifications which are required on these systems. These modifications will be performed on Units 3 and 4 prior to the fuel load date for each respective unit.

The North Anna Service Water Reservoir and spray system will be qualified for the operation of North Anna Units 1, 2, 3, and 4 with the completion of all indicated modifications.

Please contact us if you should require additional information.

Very truly yours,



Sam C. Brown, Jr.  
Senior Vice President  
Power Station Engineering and Construction

Enclosures

cc: Mr. James P. O'Reilly, Director  
Office of Inspection & Enforcement  
Region II