August 3, 1989

Docket Nos. 50-338
and 50-339

DISTRIBUTION
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PDII-2 R/F
SVarga, 14/E/4
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OGC (info. only)
EJordan, 3302 MNBB
BGrimes, 9/A/2
ACRS (10)

Mr. W. R. Cartwright
Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Dear Mr. Cartwright:

SUBJECT: PIPE STRESSES DUE TO DIFFERENTIAL SETTLEMENT BETWEEN SERVICE BUILDING AND MAIN STEAM VALVE HOUSE - NORTH ANNA POWER STATION UNITS 1 AND 2 (NA-1&2) REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. 67985 AND 67986)

Our ongoing review of your submittals dated March 10, 1988 and March 23, 1989, as well as the Stone and Webster Engineering Corporation Report entitled "Engineering Pipe Stress Analysis Calculation" dated May 8, 1981, has identified a list of comments that require clarification. These comments are provided in the enclosure to this letter.

Your responses should be provided in your forthcoming license amendment request which addresses the long-term resolution of the subject as noted above.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than 10 respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by:

Leon B. Engle, Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosure:
Request for Additional
Information

cc w/enclosure:
See next page

[TAC NOS 67985/67986]

LA:PDII-2	PM:PDII-2	D:PDII-2	
DMiller	LEngle:bld	HBerkow	
07/31/89	07/31/89	07/31/89	

Mr. W. R. Cartwright
Virginia Electric & Power Company

North Anna Power Station
Units 1 and 2

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

Review of Pipe Stresses due to Differential Settlement
between Service Building and Main Steam Valve House,
North Anna Power Station, Units 1 and 2

References:

1. SWEC Report "Engineering Pipe Stress Analysis Calculation," dated May 8, 1981.

2. VEPCo letter dated March 10, 1988.

3. VEPCo letter dated March 23, 1989.

1. The results indicate that the relative displacement of the encased pipes is much larger than that of the open pipes (Reference 1, page 48B, nodes 5C, 25C and 40C) although the rigidity of the encased pipes is much greater than that of the open pipes. This appears inconsistent and should be explained. It is recognized that the elastic spring assumed for the soil will also control the displacement values.

2. Please provide the following information:

   a) The basis for the subgrade coefficient and the anchor stiffness values assumed in the analysis.

   b) A layout drawing of the pipe line including the attachments at anchor points.

3. Please justify the use of the formula for a rectangular cross section in computing the soil spring stiffness value for the open pipes.

4. Since it is difficult to accurately estimate the analysis parameters (e.g., soil spring constant, spacing of springs, anchor stiffness), the effect of variation of the parameters should be investigated considering bounding values.

5. Reference 2 mentions a stress value of 44,176 psi corresponding to a settlement of 0.047 ft. This stress value apparently does not correspond to that computed in Reference 1. This apparent inconsistency may be addressed in the "1981 Report" which is not available at NRC. Please provide this report and explain the inconsistency.

6. Since a small amount of settlement (e.g., on the order of 1/2 inch) produces a stress value comparable to the allowable limit, the true relative displacements and the resulting strains should be more carefully monitored rather than depending on the survey results of the buildings.

For this small value, the actual relative displacements between two ends of the pipe line may be significantly different than from what are being predicted by the survey results. It is recognized that some consideration to alternate monitoring methods has been discussed in Reference 3. However, it is suggested that the feasibility of monitoring by direct measurement (e.g., strain gauges, etc.) be further explored. (Note that the survey results indicate a higher settlement at point 114 than that at point 117).

7. It is not clear whether VEPCo is requesting removal of the settlement monitoring requirements in the Technical Specifications for both the old and the new (replacement) pipes or for only the old pipes that have been removed (Reference 2, Attachment 2, first page, Discussion Section). This should be clearly stated.