October 22, 2001

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE NORTH ANNA NUCLEAR STATION, UNITS 1 AND 2, AND SURRY NUCLEAR STATION, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION

Dear Mr. Christian:

By letter dated May 29, 2001, Virginia Electric and Power Company (VEPCO) submitted for Nuclear Regulatory Commission (NRC) review an application, pursuant to 10 CFR Part 54, to renew the operating licenses for the North Anna Nuclear Station, Units 1 and 2 (NAS1 and 2), and Surry Nuclear Station, Units 1 and 2 (SPS 1 and 2). The NRC staff is reviewing the information contained in license renewal application (LRA) and has identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed requests for additional information (RAIs) are from Section 3.6, "Aging Management of Electrical and Instrument and Controls," Section 4.7.3, "Leak-Before-Break," and Section B2.1.3, "Tank Inspection Activities."

Please provide a schedule by letter, or electronic mail for the submittal of your responses within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with VEPCO prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

Sincerely,

/***RA***/

Robert J. Prato, Project Manager
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-338, 50-339, 50-280, and 50-281

Enclosure: As stated

cc w/encl: See next page

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Request for Additional Information
North Anna Nuclear Station, Units 1 and 2, and
Surry Nuclear Station, Units 1 and 2

Section 3.6, "Aging Management of Electrical And Instrumentation and Controls"

RAI 3.6-1 In response to the staff's request for the applicant to management aging of non-EQ insulated power, instrumentation, and control cables and connectors, as documented in a letter dated June 17, 2001, the applicant commits to a visual inspection of representative samples of accessible insulated power, instrumentation, and control cables and connectors. Visual inspection alone, however, will not necessarily detect reduced insulation resistance (IR) levels in cable insulation before the intended function is lost. Exposure of electrical cables to adverse localized environments caused by heat or radiation can result in reduced IR. A reduction in IR will cause an increase in leakage currents between conductors and from individual conductors to ground, and is a concern for circuits with sensitive, low level signals such as radiation and nuclear instrumentation since it may contribute to inaccuracies in the instrument loop. Because low level signal instrumentation circuits may operate with signals that are normally in the low milliamp range or less, they can be affected by extremely low levels of leakage current. These low levels of leakage current may affect instrument loop accuracy before the adverse localized environment can cause changes that are visually detectable. Routine calibration tests performed as part of the plant surveillance test program can be used to identify the potential existence of this aging degradation.

The staff is not convinced that aging of these cables will initially occur on the outer casing resulting in sufficient damage such that visual inspection will be effective in detecting the degradation before IR losses lead to a loss in intended function. Therefore, the applicant is asked to provide a technical justification that will demonstrate that visual inspections will be effective in detecting damage before current leakage can affect instrument loop accuracy, or provide a description of an AMA that will demonstrate that the effects of aging will be managed such that the intended function will be maintained consistent with the current licensing basis for the period of extended operation.

RAI 3.6-2 Under "Preventive Actions" in the non-EQ cable monitoring activity the applicant states that "periodic actions will be taken to prevent inaccessible non-EQ medium-voltage cables from being exposed to significant moisture . . . ." In the same non-EQ cable monitoring activity under "Acceptance Criteria" the applicant states that "[t]he acceptance criterion with respect to wetted conditions is the absence of long-term submergence of cables." The term "significant moisture" used in the preventive actions has been understood in past LRAs to mean periodic exposures to moisture that last more than a few days (i.e., cable in standing water). Periodic exposures to moisture of less than a few days (i.e., normal rain and drain) are not significant. Please revise your definition of significant moisture in the context of its use in the non-EQ cable monitoring AMA to mean "periodic exposure to moisture that last more than a few days," or

provide a technical justification to the contrary. In addition, verify that this same definition applies to the terminology "long-term submergence" used in the acceptance criteria of the non-EQ cable monitoring activity. Finally, if a cable is determined to be exposed to significant moisture, ensure that the engineering evaluation includes cable testing to demonstrate that the cable is capable of performing its intended function.

RAI 3.6-3 In both LRAs, Table 3.0-2, regarding the external service environments exposed to borated water leakage, the applicant states that "[t]his environment is not considered for in-scope cables and connectors since cables are insulated, splices are sealed, and terminations are protected by enclosures." With regard to terminations protected by enclosures, operating experience has shown that water and borated water have migrated into enclosures and terminations by following cables or moving through conduits. Are the cables and conduit that penetrate enclosures which you credit for protecting terminations, sealed to prevent the intrusion of borated water into the enclosure? If not, provide the technical basis for concluding that these enclosures will protect the enclosed terminations from borated water leakage.

Section 4.7.3, " Leak-Before-Break"

RAI 4.7.3-1 In the NAS LRA, Section 4.7.3, the applicant identifies the leak-before-break (LBB) analysis for primary loop piping as a time-limited aging analysis (TLAA). As part of its analysis, the applicant identified the steam generator primary nozzles to safe-end welds in the primary loop piping that was analyzed for LBB as the only components fabricated with Alloy 82/182-weld material for NAS 1 and 2. The applicant went on to state that primary water chemistry is controlled by the chemistry control program for the primary system (an AMA described in Section B2.2.4 of the LRA) and, therefore, no known active degradation mechanism for primary water stress-corrosion cracking (PWSCC) exists for these welds. The applicant also states that it is participating in the ongoing NRC/industry program on alloy 82/182-weld material and will implement the findings/resolution from this effort.

As a result of this discussion, the staff noted that the applicant can not take credit for its chemistry control program for the primary system to determine that PWSCC is not an applicable aging effect for the welds of concern. The applicant referred the staff to Table 3.1.5 -1 that includes the welds of concern, cracking as an applicable aging effect, and water chemistry control as the AMA. However, the staff does not believe that chemistry control alone can adequately manage this aging on the basis of information currently available to the industry. Upon conclusion of the ongoing NRC/industry program relating to 82/182-weld materials, other aging management is expected to be needed for these welds.

Therefore, the applicant is requested to provide addition information regarding the need to include a summary description (and/or follow-up action) in its FSAR Supplement describing future (or follow-up action items for) aging management activities consistent with 10 CFR 54.21(d).

Section B2.1.3, "Tank Inspection Activities"

RAI B2.1.3-1 The scope of this aging management program includes the tanks which are above ground, as well as those that are located below grade. Experience with the implementation of Unresolved Safety Issue (USI) A-46 indicate that for the above grade tanks, their anchorage components require frequent inspections and aging management. For the tanks located below grade, the degradation of exterior surfaces would depend upon the pH level and aggressive chemicals in the surrounding soil. Please provide more information regarding your operating experience for these broad categories of tanks for NAS and SPS.

RAI B2.1.3-2 On the bases of the description provided in the "Summary" section of this AMA, the staff understands that currently you are performing routine maintenance inspection of these tanks, and you will be performing a focused one time inspection of these tanks prior to the start of the extended period of operation. Your future inspections during the extended period of operation will depend upon the findings of this focused inspection. Please confirm and provide additional information.