October 11, 2001

Mr. David A. Christian
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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 (Dominion) 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, and Surry Nuclear Station, Units 1 and 2. The NRC staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed questions are from the electrical and instrumentation and control scoping results, and the buried piping and valve inspection activities, Sections 3.1.1, 3.1.2, 3.5.1, 3.5.2, 3.5.3, 3.5.4, 4.4, B2.2.1, B2.2.7, B2.2.9, B2.2.17, and B2.2.19.

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 Dominion 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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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 Dominion prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

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DOCUMENT NAME: C:\Program Files\Adobe\Acrobat 4.0\PDF Output\RAIs 3.1.1, 3.1.2, 3.2, 3.5~.wpd

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Section 3.1.1, "Reactor Coolant System Piping And Associated Components"

3.1.1.2-1 Topical Report WCAP-14575-A, Section 3.1, "Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components" contains a discussion on industry issues associated with the RC piping components. Renewal applicant action item number 3 from the staff's final safety evaluation report (SER) states that "[t]he renewal applicant should complete the updated review of generic communications and capture any additional items not identified by the original review." The original review includes published documents up to 1994. In response to the renewal applicant action item, the applicant states that it has completed a review of all generic communications related to the RCS components. Discuss the criteria used to determine which issues in the generic communications required an aging management review.

3.1.1.2-2 Renewal applicant action item number 6 from the staff's final SER for WCAP-14575-A states that, "[t]he license renewal applicant should perform additional inspection of small-bore RC system piping, that is, less than 4-inch-size piping, for license renewal to provide assurance that potential cracking of small-bore piping is adequately managed during the period of extended operation." In response to this action item, the applicant states that selected volumetric examinations are being performed on Surry, Unit 1, on a sample population of welds in several 3-inch lines in the safety injection (SI) and chemical and volume control systems (CVCS). The SI and CVCS lines are Class 2; however, they are used as leading indicators for small-bore piping conditions in Class 1 systems. Provide justification for the conclusion that the SI and CVCS small-bore lines bound all small-bore lines within the scope of the license renewal for the RC piping system.

3.1.1.2.2-1 Both LRAs, Table 3.1.1-1, identifies the inservice inspection (ISI) program as an aging management activity for cracking in piping and valve bodies. The footnotes in Table 3.1.1-1 indicate that ISI as an aging management activity is applicable to Class 1 components only. If there are any Class 2 piping or valve bodies that are within the scope of the license renewal for RC piping and associated components discuss how cracking as an applicable aging effect will be managed during the period of extended operation.

Section 3.5, "Aging Management of Structures and Component Supports"

3.5-1 In both LRAs, Section 3.5.1, the applicant does not include an aging management review of a de-watering system for control of hydrostatic pressure to the containment liner plate. If a de-watering system is relied upon for control of hydrostatic pressure to the containment liner plate, then the de-watering system needs to be included within the scope of license renewal and subject to an aging management review, as applicable. Therefore, the applicant needs to demonstrate that the buildup of hydrostatic pressure cannot affect the intended function of the Containment liner plate, or needs to provide an aging management program for the SCs of the containment de-watering system.

3.5-2 Both LRAs, Section 3.5.1, contain a statement that the structures and structural members located below the local groundwater elevation are not exposed to aggressive chemicals on the basis of recent chemical analyses of the groundwater described in Appendix C. The results of the recent groundwater analyses, presented in Appendix C were reviewed by the staff. The pH level, chloride content, and sulfate content demonstrate that the groundwater is not aggressive. Consequently, the staff agrees that loss of material, cracking, and change in material properties caused by aggressive chemical attack are not significant for below grade exterior concrete regions for structures and structural components that are within the scope of license renewal and subject to an aging management review. In addition, loss of material due to corrosion of embedded steel and cracking due to corrosion of embedded steel for below grade exterior regions are not significant. However, there is no discussion on future sampling to ensure that groundwater conditions do not change. Identify if the associated aging management activities include period sampling of groundwater to ensure non-aggressive conditions throughout the period of extended operation, or provide a technical basis for not requiring periodic sampling.

3.5-3 In both LRAs, Section 3.5.1 and Table 3.5.1-1, the information provided indicates that no aging effects of containment concrete require aging management. However, for the containment concrete (dome, walls, and basemat) there has been sufficient operating experience that demonstrate the need for aging management of containment structures (e.g., NRC Secy-96-080, April 16, 1996, "...nearly one-half of the concrete containments have reported degradation related to the concrete or the post-tensioning system.") Consequently, 10 CFR 50.55a requires inservice inspection of containment concrete in accordance with ASME Section XI, Subsection IWL (Examination Category L-A) and also specifies additional provisions beyond those required in Subsection IWL. It was noted that the implementation of the ASME Code, Section XI, Subsection IWL, Examination Category L-A, inservice examination is a current requirement and, therefore, the same program could be credited for the period of extended operation. On the basis of the above discussion, the applicant is asked to either credit its ASME Code, Section XI, Subsection IWL, Examination Category L-A, inservice examination or a similar program as its AMA for containment concrete, or provide a more detailed technical justification for not managing potential aging of containment concrete.

3.5-4 In both LRAs, Section B2.2.12, the applicant does not identifies ISI, Subsection IWE, Category E-D (seals, gaskets, and moisture barriers) inspection activities as being within the scope of the ISI aging management activities. Therefore, the staff requests that the applicant identify the aging management activities for seals, gaskets, and moisture barriers, as applicable, or provide a technical justification for not managing any of these components that are within the scope of license renewal and subject to an AMR.

3.5-5 In both LRAs, Appendix B, the information provided states that the ISI Program - Containment Inspection includes Category E-P (all pressure retaining components), which refers to 10 CFR 50, Appendix J, Option B. However, there is no description of the 10 CFR 50, Appendix J leak rate testing activity as an aging management program. In a conference call with the applicant, dated August 8, 2001, the applicant stated that Option B is one means of fulfilling the requirements of 10 CFR Part 50, Appendix J. The applicant verified that they use Option B as approved by the staff for both NAS and

SPS. However, in previous discussions with the industry, the staff justified the need for an applicant to credit an integrated leak-rate program that is described in more detail in the LRA. Although the staff has determined that an integrated leak rate test performed in accordance with Appendix J, Option B, and consistent with the requirements in TS is one means of managing the applicable aging of the Containment structure, simple reference to the ISI Program - Containment Inspection includes Category E-P, which in turn references Appendix J, Option B, is in itself not sufficient for the staff to make its determination. The applicant needs to more clearly document that the testing will be performed in accordance with Appendix J, Option B, and consistent with the associated requirements in TS.

3.5-6 In both LRAs, Section 3.5.1 (under the heading "Environment"), the information provided indicates that the general air temperature in containment is not greater than 150° F, and hot pipe penetrations are exposed to elevated localized temperatures of less than 200° F. Elevated temperatures in the auxiliary building structures, other Class I structures (except the main steam valve house), and fuel buildings are not addressed in the LRAs, Sections 3.5.2 through 3.5.4. In a telecommunication dated August 8, 2001, the applicant stated that with the one exception noted above, the air temperature for both plant containments are maintained below 150°F, and that there are no known areas of localized air temperatures greater than 200°F. The applicant needs to more clearly document this information for the staff to perform its evaluation.

3.5-7 In both LRAs, Sections 3.5.2, 3.5.3, and 3.5.4, the information provided does not include a discussion regarding operating experience associated with structural concrete members. Industry experience indicates that age-related concrete degradation has occurred at a number of plants. In a telecommunication dated August 8, 2001, the applicant maintained that they are unaware (with the exception of the SPS intake structure) of any ongoing aging at North Anna and Surry that can adversely effect the intended function of any on-site structures for the period of extended operation. However, on the basis of the staff's concern, they agreed to manage potential aging of the Containment by crediting its existing ISI-IWL, Category L-A as stated in RAI 3.5-4, above. The applicant will use the findings from these inspections as a leading indicator for potential aging of other on-site structures, and will take appropriate steps to address the aging of the containment structure and other on-site structures under its 10 CFR Part 50, Appendix B program. Although this approach appears reasonable, the staff does not agree that an extrapolation of structural aging for the period of extended operation can be made based on the past performance or the on-going aging of the containment structure to other structures requiring aging management. On the basis of this discussion, the staff requests that the applicant either, implement an AMA for the potential aging of the concrete nuclear structures (other than containment) that are within the scope of license renewal, or provide a technical justification for not managing the associated aging, such that there is reasonable assurance that the intended function(s) will be maintained consistent with the CLB throughout the period of extended operation.

Section 3.6, "Aging Management of Electrical and Instrument and Controls"

3.6.2-1 In both LRAs, Section 3.6.2, the applicant does not identify any applicable aging effects for non-environmentally qualified cables. Industry operating experience indicates that aging of cables requires aging management. Therefore, the applicant is requested to perform an aging management review of non-EQ cables consistent with industry operating experience and submit aging management activities that demonstrate that the applicable aging effects will be managed throughout the period of extended operation.

Section 4.4, "Environmental Qualification"

4.4-1 Please provide a description of the North Anna and Surry environmental qualification reanalysis attributes.

Section B2.2.1, "Augmented Inspection Activities"

B2.2.1-1 Both LRAs, Section B2.2.1, need additional information regarding the operating experience for the existing augmented inspection activities at NAS 1 and 2, and SPS 1 and 2. Operating experience should include a discussion of past aging and/or failures detected, and any corrective actions resulting in program enhancements or additional programs. A past failure would not necessarily invalidate an AMP because the feedback from operating experience should have resulted in appropriate program enhancements or new programs. This information should demonstrate that there is reasonable assurance that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

Section B2.2.7, "Fire Protection Program"

B2.2.7-1 Provide the following information regarding the "Parameters Monitored and Inspected:"

a. The LRAs, Section B2.2.7, contain a statement that penetration seals are checked for an adequate amount of fire-stop material. Provide a complete description of the parameters monitored and inspection. Specifically state whether the parameters monitored and inspected include examinations for any sign of degradation such as cracking, seal separation from walls and components, separation of layers of material, rupture, and puncture of seals which are directly caused by increased hardness and shrinkage of seal material due to weathering. If not, explain the technical basis for the inspections that are performed.

b. Describe the aging management activity used to monitor the performance of the fire protection diesel-driven fire pump fuel line to ensure that it can perform the intended function. Provide sufficient detail of the AMAs used to adequately demonstrate that the applicable aging effects are being managed such that the intended function will be maintained consistent with the CLB throughout the period of extended operation.

B2.2.7-2 Provide an aging management program that as a minimum includes a one-time non-intrusive inspection of a representative sample of fire suppression piping, near the end of the current operating term, and a second inspection within a reasonable length of time (within one refueling cycle) after the 50-year sprinkler head testing/inspection activity required by the NFPA. During these inspections, verify that excessive wall thinning has not occurred such that it may adversely affect the pressure boundary intended function of the system. In addition, verify that the inner-diameter of the pipe will provide sufficient system pressure to meet its intended function. As an alternative, an applicant can consider using its work control process as long as they can demonstrate that sufficient inspections of a representative sample of system piping is performed at an adequate frequency. The only other alternative, is to provide a technical justification, consistent with the material(s) and environment(s), that aging will not occur within the portions of this system that are within the scope of license renewal and subject to an AMR.

B.2.2.7-3 In the LRAs, Section B2.2.7, the discussion on monitoring and trending contains a statement that various types of fire protection equipment are visually inspected at frequencies that vary from 31 days to 3 years. More specific information is needed regarding the frequency of inspections for the applicable components. Provide the inspection/test frequencies and discuss the technical basis for the following items:

a. penetration seal inspections (including percent of each type inspected each time)
b. fire door inspections for holes in the skin, clearances, wear or missing parts
c. fire door functional tests to verify the operability of automatic hold-open, release, closing mechanisms and latches
d. yard fire hydrant visual inspections
e. fire hydrant hose hydrostatic tests, gasket inspections, and fire hydrant flow tests
f. sprinkler system inspections

B2.2.7-4 Both LRAs, Section B2.2.7, need additional information regarding operating experience. Please consider any operating experience regarding NRC Generic Letter 92-08 and NRC Information Notices 88-56, 91-47, 94–28, 97-70. Discuss the extent to which the fire barrier experiences reported in these references have been incorporated in the Fire Protection Program.

Operating experience should include a discussion of past aging and/or failures detected, and any corrective actions resulting in program enhancements or additional programs. A past failure would not necessarily invalidate an AMP because the feedback from operating experience should have resulted in appropriate program enhancements or new programs. This information should demonstrate that there is reasonable assurance that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

Section B2.2.9, "General Condition Monitoring Activities"

B2.2.9-1 In both LRAs, Section B2.2.9, under "Monitoring and Trending," reference is made to the use of a "spaces approach" for visual monitoring. Explain what is meant by "spaces approach." Also, clarify that all supports, piping, doors and equipment in all the systems, structures and commodities included in the scope of this program are inspected at least once per refueling outage. If not, explain the inspection frequency for full coverage of all the items in the scope of this AMP and the technical basis for the approach.

B2.2.9-2 In both LRAs, Section B2.2.9, under "Operating Experience," additional information is needed. Provide specific information regarding the operating experience for this existing program at NAS 1 and 2 and SPS 1and 2. Operating experience should include a discussion of past aging and/or failures detected, and any corrective actions resulting in program enhancements or additional programs. A past failure would not necessarily invalidate an AMP because the feedback from operating experience should have resulted in appropriate program enhancements or new programs. This information should demonstrate that there is reasonable assurance that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

B2.2.9-3 Both LRAs, Section B2.2.9, identify licensee follow-up actions. After discussions with the applicant, the staff discovered that both LRAs, Table B4.0-1, contains a comprehensive list of follow-up action items. The staff expressed the need to include these follow-up items in the FSAR Supplement. The applicant agreed to comply with the staff's request and to include these items in the FSAR Supplement. Therefore, per this RAI, the staff is requesting that the applicant describe how it intends to include this list of follow-up items, and to verify that they will include these items in their next revision of the FSAR Supplement.

Section B2.2.17, "Service Water System Inspections"

B2.2.17-1 Both LRAs, Section B2.2.17, contain a statement that the acceptance criterion for visual inspections is the absence of anomalous indications that are signs of degradation. Clarify whether the program also includes acceptance criteria based on effective cleaning of biological fouling organisms and maintenance of protective coatings or linings. If not, explain why such criteria are not part of the program.

Section B2.2.19, "Work Control Process"

B2.2.19-1 Both LRAs, Section B2.2.19, under "Monitoring and Trending," the applicant needs to clearly state that they withdraw their reference to EPRI Report TR-107514. Furthermore, to demonstrate that the work control process provides sufficient opportunity to adequately manage the applicable aging effects, the applicant needs to provide a summary of its operating experience for the past seven years by system and structure (that credits the work control process) that

specifically shows that the work control process provides sufficient opportunity to examine the different materials and environments such that there is reasonable assurance that the applicable effects of aging will be managed such that the intended function will be maintained during the period of extended operation. To demonstrate reasonable assurance, the applicant should characterize the type of maintenance as predictive, preventive, and periodic corrective maintenance. The applicant should avoid use of one-time corrective maintenance, although multiple one-time corrective actions over the period of review for a particular system (or structure), a specific material, and a specific environment can be used as a single data point. In addition, in the NAS LRA, Page B-121, it is stated that: "As a Licensee Follow-up Action, changes will be implemented into the maintenance procedures to provide reasonable assurance that consistent internal inspections will be completed during the process of performing maintenance tasks. These changes will be implemented prior to the end of the current operating license." In order to understand the intent of this statement, explain the type and corresponding purpose of the changes that will be implemented. Also, explain what provisions will be provided to ensure that the referenced inspections/tests are performed by qualified personnel who have full knowledge of the type and scope of the inspections/tests to be performed.

B2.2.19-2 The applicant needs to provide more detailed information regarding the proposed type(s) of, and corresponding purpose(s) for, the changes to the maintenance activities discussed under the work control process. The applicant also needs to describe the qualifications of the individual performing the, and the acceptance criteria for the, visual inspections activities associated with this program.

B2.2.19-3 Both LRAs, Section B2.2.19, under, "Operating Experience," need additional information regarding the operating experience for the existing Work Control Process at NAS 1 and 2, and SPS 1 and 2.

Operating experience should include a discussion of past aging and/or failures detected, and any corrective actions resulting in program enhancements or additional programs. A past failure would not necessarily invalidate an AMP because the feedback from operating experience should have resulted in appropriate program enhancements or new programs. This information should demonstrate that there is reasonable assurance that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

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