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FROM: DUE: 01/30/03 EDO CONTROL: G20020722  
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FINAL REPLY:

George E. Apostolakis, ACRS

TO:

Chairman Meserve

FOR SIGNATURE OF : \*\* GRN \*\* CRC NO: 02-0835

Travers, EDO

DESC:

ROUTING:

Report on the Safety Aspects of the License  
Renewal Applications for the North Anna Power  
Station Units 1 and 2 and the Surry Power Station  
Units 1 and 2

Travers  
Paperiello  
Kane  
Norry  
Craig  
Burns/Cyr  
Thadani, RES  
Schoenfeld, OEDO  
ACRS File

DATE: 12/31/02

ASSIGNED TO: CONTACT:  
NRR Collins

SPECIAL INSTRUCTIONS OR REMARKS:

Prepare response to ACRS for EDO signature. Add  
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**ACTION OFFICE:** EDO

**AUTHOR:** George Apostolakis  
**AFFILIATION:** ACRS  
**ADDRESSEE:** Richard Meserve  
**SUBJECT:** Report on the safety aspects of the lic renewal appls for the North Anna power stations units 1 and 2 and the Surry power station units 1 and 2

**ACTION:** Appropriate  
**DISTRIBUTION:** RF

**LETTER DATE:** 12/18/2002  
**ACKNOWLEDGED:** No  
**SPECIAL HANDLING:**

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**DATE DUE:** **DATE SIGNED:**

EDO --G20020722



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, D.C. 20555-0001

December 18, 2002

The Honorable Richard A. Meserve  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE LICENSE RENEWAL APPLICATIONS FOR THE NORTH ANNA POWER STATION UNITS 1 AND 2 AND THE SURRY POWER STATION UNITS 1 AND 2**

Dear Chairman Meserve:

During the 498<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, December 5-7, 2002, we completed our review of the License Renewal Application for North Anna Power Station (NAS) Units 1 and 2, the Surry Power Station (SPS) Units 1 and 2, and the final Safety Evaluation Report (SER) prepared by the staff of the U. S. Nuclear Regulatory Commission (NRC). Our review included a meeting of our Plant License Renewal Subcommittee on July 9, 2002. During our review, we had the benefit of discussions with representatives of the NRC staff and Virginia Electric and Power Company (Dominion). We also had the benefit of the documents referenced.

#### **CONCLUSIONS AND RECOMMENDATIONS**

1. The Dominion application for renewal of the operating licenses for NAS Units 1 and 2 and SPS Units 1 and 2 should be approved.
2. The programs instituted to manage aging-related degradation are appropriate and provide reasonable assurance that NAS Units 1 and 2 and SPS Units 1 and 2 can be operated in accordance with their current licensing bases for the period of extended operation without undue risk to the health and safety of the public.

#### **BACKGROUND AND DISCUSSION**

This report fulfills the requirement of 10 CFR 54.25 which states that the ACRS should review and report on license renewal applications. Dominion requested renewal of the operating licenses for NAS Units 1 and 2 and SPS Units 1 and 2 for a period of 20 years beyond the current license terms, which expire on April 1, 2018 (NAS Unit 1); August 21, 2020 (NAS Unit 2); May 25, 2012 (SPS Unit 1); and January 29, 2013 (SPS Unit 2). The final SER, issued on November 5, 2002, documents the results of the staff's review of information submitted by Dominion, including commitments that were necessary to resolve the open items identified by the staff in the initial SER. This review of the

application was conducted concurrently for two stations with a total of four units. Given the similarity of the units and the formatting of the application, which clearly highlighted the few differences, the concurrent review did not present any unusual difficulties.

The staff reviewed the completeness of the identification of structures, systems, and components (SSCs) subject to aging management; the integrated plant assessment process; the applicant's identification of the possible aging mechanisms associated with passive, long-lived components; and the adequacy of the aging management programs. The staff also conducted three inspections. First, a 1-week inspection was performed to assess the applicant's scoping and screening methodology. Next a 1-week inspection was conducted at each facility to assess plant material condition and aging management programs. Lastly, an inspection was performed to close open items resulting from the earlier inspections.

The staff provided the Committee with details of the scope and results of its inspections of material condition at both plants. We agree with the staff's assessment that there are no issues that would preclude renewal of the operating license for NAS Units 1 and 2 and SPS Units 1 and 2.

On the basis of our review of the final SER, we agree that all open items and confirmatory items have been appropriately closed. We also discussed several items that were raised at the Subcommittee meeting on July 9, 2002, and found that the staff and the applicant have satisfactorily addressed each item.

The processes implemented by the applicant to identify SSCs that are within the scope of license renewal were effective. As with several previous applicants, the staff engaged in considerable discussion with the applicant regarding the portion of the offsite power system to be included within the scope of license renewal. After reviewing the information provided by the applicant, we agree that appropriate portions of the offsite power system are included in scope. During our review, we questioned why certain other SSCs were not included within the scope and, in all cases, the applicant provided appropriate justification for exclusion.

The applicant has performed a comprehensive aging management review of SSCs that are within the scope of license renewal. There are 19 existing aging management programs and four new programs.

The applicant has satisfactorily responded to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated March 18, 2002. Further, the applicant has committed to replace all four reactor vessel heads. The replacement of the NAS Unit 2 head is currently in progress.

The applicant used the guidance specified in Westinghouse Owners Group reports for reactor coolant system piping, pressurizer, and reactor internals. The staff reviewed and approved the use of these reports with certain stipulations. Each stipulation was sufficiently addressed in the staff's review.

We questioned the method by which reactor coolant piping is to be inspected in light of the failure of the initial volumetric inservice inspection to detect vessel nozzle cracking at V.C. Summer. Although continued improvement in the inspection methodology is warranted, the staff considers current methods adequate to detect primary water stress corrosion cracking. This is a generic issue and we remain concerned with the effectiveness of inspection techniques. Dominion has committed to employ best industry practices as they are developed.

Dominion has also committed to conduct a one-time inspection of a representative sample of buried piping. Opportunistic inspections of in-scope buried piping will be performed when the piping is uncovered during other maintenance activities. If significant degradation is identified, the results will be entered into the licensee's corrective action program and the inspection will be expanded. If no opportunity presents itself by the end of the current license period, excavations will be made to inspect the piping.

The applicant's erosion/corrosion program is of particular interest in light of the previous carbon steel piping failures at SPS. Dominion uses the CHECWORKS program to identify locations to be monitored and trend erosion/corrosion rates. The program appears to be effective in managing erosion/corrosion.

Certain medium-voltage cables exposed to moisture for long periods of time fail due to a phenomenon called "water treeing." To preclude this failure, the applicant has committed to a program that will control water in manholes and underground ducts associated with energized power cables. The Cable Monitoring Activities Program for non-environmentally qualified cable has been enhanced to ensure that if degraded cable is identified, the cable environment, including the potential for moisture shall be evaluated and appropriate corrective actions initiated through the corrective action program.

During the discussion of time-limited aging analyses, we expressed a concern that the applicant had not submitted its evaluations of the reactor vessel margins for pressurized thermal shock and upper shelf energy. The staff had accepted the applicant's position that these values were acceptable without performing an independent evaluation. Subsequently, the staff obtained this information from the applicant and the staff performed an independent evaluation. Although in some cases the margins are small, we agree with the staff's position that margin does exist. We believe that in the future such critical parameters should be reviewed by the staff. The staff agreed to require that these data be provided with future license renewal applications.

In several situations, Dominion and other applicants have committed to actions based on future technology development. In Dominion's case, two examples are (1) the method for inspecting reactor coolant piping, and (2) the method for testing of medium-voltage cables exposed to moisture. The NRC staff needs to continue to keep abreast of these developing technologies and review and approve methodologies at the appropriate time.

License renewal applications include a number of activities and commitments, for example one-time inspections, that will not be accomplished until near the end of the current license period. There is a large amount of inspection activity that needs to be conducted at that time period. The staff is aware of this future work load and is working on a plan to properly manage this significant effort.

The applicant and the staff have identified plausible aging effects associated with passive, long lived components. Adequate programs have been established to manage the effects of aging so that NAS Units 1 and 2 and SPS Units 1 and 2 can be operated in accordance with their current licensing bases for the period of extended operation without undue risk to the health and safety of the public.

Sincerely,

A handwritten signature in black ink, appearing to read "George E. Apostolakis", with a long horizontal flourish extending to the right.

George E. Apostolakis  
Chairman

References:

1. U.S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the License Renewal of the North Anna Power Station, Units 1 and 2, and the Surry Nuclear Station, Units 1 and 2," issued November 2002.
2. Dominion Application for Renewed Operating License for North Anna Power Station, Units, 1 and 2, and Surry Power Station, Units 1 and 2, submitted May 29, 2001.