UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

July 18, 2005

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: DOMINION NUCLEAR NORTH ANNA, LLC, EARLY SITE PERMIT APPLICATION AND THE ASSOCIATED NRC FINAL SAFETY EVALUATION REPORT

Dear Chairman Diaz:

During the 524th meeting of the Advisory Committee on Reactor Safeguards, July 6-8, 2005, we met with representatives of the NRC staff and Dominion Nuclear North Anna, LLC (Dominion) and discussed the final safety evaluation report of the Dominion application for the North Anna early site permit (ESP). Our reviews of the application and the staff's safety evaluation report were conducted to fulfill the requirement of 10 CFR 52.23, which states that the ACRS shall report on those portions of an early site permit application that concern safety. We had the benefit of the documents referenced.

CONCLUSIONS

- The proposed site, subject to the permit conditions recommended by the NRC staff, can be used for up to two nuclear power units each of up to 4300 MW_{th} without undue risk to the public health and safety.

- The staff's final safety evaluation report of the Dominion early site permit application will contribute to the documentary basis for the mandatory public hearing concerning the proposed early site permit.

DISCUSSION

Dominion has submitted a first-of-a-kind application for an early site permit pursuant to the requirements of Subpart A, "Early Site Permits," of 10 CFR Part 52. The proposed site is entirely within the current North Anna Power Station site about 40 miles north-northwest of Richmond, Virginia. Years ago, this site was approved for four units, but only two units (3-loop Westinghouse pressurized water reactors) were constructed. Both of these units are now operating.

The Dominion application is to locate up to two nuclear power units on the proposed site. Each unit is to have a power of up to 4300 MW_{th}. The Dominion application is based on a set of conservative, enveloping parameters defined to allow flexibility in the selection of reactor technology should a decision be made in the future to actually develop the site.

- Nature of the Proposed Site

The vicinity of the proposed site is rural in nature. There are no significant industrial, transportation, or military facilities within five miles of the site center. The major water sources available to the site are the North Anna river and an artificial lake adjacent to the site. The dam for this lake is under the control of the applicant. The applicant has recognized that water availability may be insufficient for two water-cooled units and proposes air cooling for one unit on the proposed site. The staff proposes that this be made a permit condition.

- Population in the Vicinity of the Site

The permanent population around the site is quite low. The nearest population center, Mineral, Virginia, has a population of less than 500. The nearest significant cities are Fredericksburg (projected year 2065 population 20,950) at a distance of 22 miles, Charlottesville (year 2000 population 45,069) at 36 miles, and Richmond (year 2000 population 197,790) at 40 miles. The applicant used methods found acceptable by the staff to show that projected populations in the vicinity of the site through the year 2065 will still be within acceptable limits.

- Geology and Seismicity of the Site

The proposed site will have reactors founded on hard rock. Dominion has undertaken a thorough effort to update geologic and seismic information concerning the site and has made use of methods that are new since the construction of reactors now operating on the North Anna site to characterize the proposed site. The staff has approved these analyses as they have been amended in four revisions of the initial application. Because of the hard rock foundations, reactors on the site would be subject to significant seismically-induced accelerations at frequencies in excess of 10 Hz. Dominion originally proposed to use a new "performance-based" method described in its application to derive a safe shutdown earthquake spectrum that bounds what was determined by the staff using its own methods. The staff has not endorsed the proposed performance-based applicant's methods. Dominion has ultimately elected to use the staff's method as identified in Regulatory Guide 1.165. The staff concurs with conclusions reached by the applicant.

- Meteorology

The applicant has done a thorough examination of historical meteorological data to set design constraints for such things as maximum rainfall, wind velocities, snow pack and temperature extremes. The staff has found these findings to be acceptable. The design constraints posed by the proposed site meteorology are not severe in comparison to design parameters for candidate reactor technologies considered in the development of the early site permit application.

- Potential Radionuclide Releases

For the studies of radiological source terms at the proposed site, Dominion has selected two advanced reactors that could be located on the site. These example plants (AP1000 and the Advanced Boiling Water Reactor) have very low predicted core damage frequencies relative to those predicted for the extant plants on the North Anna site. Dominion has used staff-approved methods to deduce that consequences of radionuclide release at the proposed site will be less than considered in the applications for the design certifications of the example plants. The staff has verified these conclusions with its own evaluations.

- Emergency Plans

The applicant has elected to submit for review just the "major features" of emergency planning for the proposed site as is allowed by the regulations. The staff has found these major features to be acceptable and concludes that the proposed site does not pose significant impediments to the development of adequate emergency plans should a decision be made to develop the site.

The staff has identified a number of items that are treated either as permit conditions or as actions that must be addressed at the combined license (COL) stage. The staff has developed criteria to identify permit conditions. Permit conditions are recommended by the staff when:

- evaluations of the site rest on an assumption that can be justified only after a site permit has been issued,
- a physical attribute exists for the site that is not acceptable for the design of systems, structures and components important to safety, or
- evaluations can be completed only after some future act has taken place.

We conclude that these are appropriate criteria for the imposition of permit conditions.

The staff has prepared a high-quality, detailed, yet readable, safety evaluation report on the Dominion application. All open items have been resolved. The staff concludes that the site is adequate for the proposed use subject to eight permit conditions.

The staff has also identified 30 items that need to be considered in conjunction with reviews of a COL application should the early site permit be granted and a decision to develop the site be made.

We concur with the staff's conclusions concerning the Dominion application for an early site permit. This first use of the early site permit process has revealed several areas where the process can be refined and streamlined. We look forward to working with the staff to improve the early site permit process.

Sincerely,

/RA/

Graham B. Wallis
Chairman

References :

1. U.S. Nuclear Regulatory Commission, Final Safety Evaluation Report, "Safety Evaluation of Early Site Permit Application in the Matter of Dominion Nuclear North Anna, LLC, for the North Anna Early Site Permit', June 16, 2005.

2. North Anna Early Site Permit Application, Revision 3, September 2004, NRC Docket No. 51-008.

3. U.S. Nuclear Regulatory Commission, Review Standard, RS-002, "Processing Applications for Early Site Permit Applications", May 3, 2004.

4. Memorandum from Luis A. Reyes, NRC Executive Director for Operations, to Graham B. Wallis, Chairman, ACRS, Subject: Interim Letter: Draft Safety Evaluation Report on North Anna Early Site Permit Application, dated June 3, 2005.

5. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.165, "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," dated March 1997.