September 16, 1997

Mr. J.P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 - ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT REGARDING EXEMPTION FROM 10 CFR 70.24(a), CRITICALITY ACCIDENT REQUIREMENTS (TAC NOS. M97906 AND M97907)

Dear Mr. O'Hanlon:

Enclosed is a copy of an "Environmental Assessment and Finding of No Significant Impact" for your information. The assessment relates to your request dated January 28, 1997, as supplemented March 24, 1997, for an exemption from 10 CFR 70.24(a), to permanently exempt North Anna Power Station, Units 1 and 2, from the criticality monitoring requirements.

This assessment has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

N. Kalyanam, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-338
and 50-339

Enclosure: Environmental Assessment

cc w/enclosure: See next page

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See change noted on pg. 2

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7590-01-P

UNITED STATES NUCLEAR REGULATORY COMMISSION

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NOS. 50-338 AND 50-339

NORTH ANNA POWER STATION, UNITS 1 AND 2

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from the provisions of 10 CFR 70.24(a) to Virginia Electric and Power Company (the licensee) for North Anna Power Station, Units 1 and 2 (NPS1&2), located in Louisa County, Virginia.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

The proposed action would exempt the licensee from the requirements of 10 CFR 70.24(a), which require a monitoring system that will energize clear audible alarms if accidental criticality occurs in each area in which special nuclear material (SNM) is handled, used, or stored. The proposed action would also exempt the licensee from the requirements to maintain emergency procedures for each area in which this licensed SNM is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon sounding of the alarm, to familiarize personnel with the evacuation plan, and to designate responsible individuals for determining the cause of the alarm, and to place radiation survey instruments in accessible locations for use in such an emergency.

The proposed action is in accordance with the licensee's application for exemption dated January 28, 1997, as supplemented March 24, 1997.

The Need for the Proposed Action:

The purpose of 10 CFR 70.24(a) is to ensure that if a criticality were to occur during the handling, use, or storing of SNM, personnel would be

alerted to that fact and would take appropriate action. At a commercial nuclear power plant, the inadvertent criticality with which 10 CFR 70.24 is concerned could occur during fuel handling operations. The SNM that could be assembled into a critical mass is in the form of nuclear fuel. The quantity of other forms of special nuclear materials that is stored onsite is small enough to preclude achieving critical mass. Since the fuel is not enriched beyond 4.3 weight percent Uranium-235 and commercial nuclear power plant licensees have procedures and features that are designed to prevent inadvertent criticality, the staff has determined that inadvertent criticality is not likely to occur during the handling of the special nuclear material. The requirements of 10 CFR 70.24(a), therefore, are not necessary to ensure the safety of personnel during the handling of special nuclear materials at commercial power plants.

Environmental Impacts of the Proposed Action:

The Commission has completed its evaluation of the proposed action and concludes that there is no significant environmental impact if the exemption is granted. Inadvertent or accidental criticality will be precluded through the design of the fuel racks providing geometric spacing of fuel assemblies in their storage locations, compliance with the NPS Technical Specifications (TS), and administrative controls imposed on fuel handling procedures.

Appendix A of 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," Criterion 62, requires that criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations. This is met at

NPS1&2, as identified in section 5.6 of the TS. Section 5.6.1.1 of the TS states the geometrically safe configurations for new fuel stored in the new fuel pit storage racks or spent fuel storage racks.

The new fuel storage area at North Anna is used to receive and store new fuel in a dry condition upon arrival onsite and prior to loading into the reactor. The new fuel is stored vertically in an array with a distance of 21 inches between assemblies to assure K_{eff} is less than or equal to 0.98 with fuel of the highest anticipated enrichment in place assuming optimum moderation, e.g., an aqueous foam envelopment as a result of local fire fighting operations. Both irradiated and unirradiated fuel are moved to and from the reactor vessel and the spent fuel pool to accommodate refueling operations, as well as within the reactor vessel and spent fuel pool. Unirradiated fuel is also moved into the Fuel Building for storage and to and from the new fuel storage area. In every case, fuel movement is procedurally controlled and designed to preclude criticality concerns. In addition, the TS specifically address refueling operations and impose restrictions on fuel movement to preclude an accidental criticality, as well as limit the movement of certain loads over the spent fuel in the reactor vessel and the spent fuel pool.

The proposed exemption would not result in any significant radiological impacts. The proposed exemption would not affect radiological effluents nor cause any significant occupational exposures since the TS, design controls, including geometric spacing of fuel assembly storage spaces, and administrative controls preclude inadvertent criticality. The amount of radioactive waste would not be changed by the proposed exemption.

The proposed exemption does not result in any significant nonradiological environmental impacts. The proposed exemption involves features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Since the Commission has concluded that there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed exemption, the staff has considered denial of the requested exemption. Denial of the request would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of resources not previously considered in connection with the Final Environmental Statement related to the operation of North Anna Power Station, Units 1 and 2, issued by the Commission in April 1973.

Agencies and Persons Consulted:

In accordance with its stated policy, the NRC staff consulted with Mr. Foldesi of the Virginia Department of Health on July 14, 1997, regarding the environmental impact of the proposed action. Mr. Foldesi had no comments on behalf of the Commonwealth of Virginia.

FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed exemption.

For further details with respect to this action, see the request for exemption dated January 28, 1997, as supplemented March 3, 1997, which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC 20555 and at the local public document room located at the Alderman Library, Special Collections Department, University of Virginia, Charlottesville, Virginia 22903-2498.

Dated at Rockville, Maryland this 16th day of September, 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

G E Edison

Gordon E. Edison, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation