

Mr. J.P. O'Hanlon
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 Virginia Electric and Power Company
 5000 Dominion Blvd.
 Glen Allen, Virginia 23060

April 24, 1997

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 - ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT REGARDING EXEMPTION FROM 10 CFR 5.44, 10 CFR 50.46, AND 10 CFR PART 50, APPENDIX K FOR DEMONSTRATION FUEL ASSEMBLIES (TAC NOS. M96530 AND M96531)

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 September 4, 1996, as supplemented February 3, 1997, for an exemption from 10 CFR 50.44, 10 CFR 50.46, and 10 CFR 50, Appendix K, to permit the insertion of four demonstration fuel assemblies with advanced cladding materials in either Unit 1 or Unit 2.

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

Sincerely,

(Original Signed By)

Gordon E. Edison, Sr. 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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NAME	GEdison	Dunnington	MReinhart	<i>U/Young</i>	
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Mr. J. P. O'Hanlon
Virginia Electric & Power Company

North Anna Power Station
Units 1 and 2

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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 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 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 enable the licensee to use demonstration fuel assemblies that contain some fuel rods whose zirconium-based cladding composition is somewhat different from the zirconium-based compound named zircaloy or ZIRLO. These demonstration assemblies would be loaded into NPS-1 for three cycles, with the initial irradiation planned for North Anna 1 Cycle 13. Irradiation of these four fuel assemblies may occur in either North Anna Unit 1 or North Anna Unit 2, or a combination of the two units, subject to the following constraints:

- (1) the assemblies are not to be irradiated for more than three full operating cycles, and
- (2) the maximum rod average burnup of any fuel rod in these assemblies

shall not exceed the North Anna Units 1 and 2 lead rod burnup restriction of 60,000 megawatt days per metric ton uranium (MWD/MTU).

The proposed action is in accordance with the licensee's application for exemption of September 4, 1996 as supplemented February 3, 1997.

The Need for the Proposed Action:

The proposed exemption to 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 is needed because these regulations specifically refer to light-water reactors containing fuel consisting of uranium oxide pellets enclosed in zircaloy or ZIRLO tubes. Zircaloy and ZIRLO are zirconium-based alloys currently in use as cladding for fuel pellets. A new zirconium-based cladding has been developed which is not the same chemical composition as zircaloy or ZIRLO, and which the licensee wants to test in reactor operation. Since 10 CFR 50.46 and 10 CFR Part 50, Appendix K, limit Emergency Core Cooling System (ECCS) calculations to zircaloy and 10 CFR 50.44 relates to the generation of hydrogen gas from a metal-water reaction with zircaloy or ZIRLO, an exemption is required in order to place four demonstration assemblies in the reactor core(s).

Environmental Impacts of the Proposed Action:

The proposed action will allow the use of the new cladding with chemical composition not significantly different from zircaloy or ZIRLO. Use of the demonstration assemblies with the new zirconium-based cladding does not affect the Emergency Core Cooling Systems calculations and has no significant effect on the previous assessment of hydrogen gas generation following a loss-of-coolant accident. With regard to potential radiological impacts to the general public, the proposed exemption involves features located entirely

within the restricted area as defined in 10 CFR Part 20. It does not affect the potential for radiological accidents and does not affect radiological plant effluents. The demonstration assemblies meet the same design bases as the fuel which is currently in the reactors. No safety limits have been changed or setpoints altered as a result of the use of these assemblies. The Final Safety Analysis Report (FSAR) analyses are bounding for the demonstration assemblies as well as the remainder of the core. The advanced zirconium-based alloys have been shown through testing to perform satisfactorily under conditions representative of a reactor environment. In addition, the relatively small number of fuel rods involved does not represent a prohibitively large inventory of radioactive material which could be released into the reactor coolant in the event of cladding failure. The only credible consequence of this change would be a failure of the demonstration claddings. Even in the case of gross fuel failure, the number of rods involved is less than 3% of the core and, thus, sufficiently small that environmental impact would be negligible and is bounded by previous assessments. The small number of fuel rods involved in conjunction with the chemical similarity of the demonstration cladding to zircaloy cladding ensures that hydrogen production would not be significantly different from previous assessments. As a result, the proposed exemption does not affect the consequences of radiological accidents. No changes are being made in the types or amounts of any radiological effluent that may be released offsite. There is no significant increase in the allowable individual or cumulative occupational exposure. Consequently, the Commission concludes that there are no significant radiological impacts associated with the proposed exemption.

With regard to the potential environmental impacts associated with the transportation of the demonstration assemblies, the advanced claddings have no

impact on previous assessments determined in accordance with 10 CFR 51.52.

With regard to potential nonradiological impacts, the proposed exemption does not affect nonradiological plant effluents and has no other environmental impact. Therefore, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed exemption.

Alternatives to the Proposed Action:

Because the Commission's staff has concluded that there is no significant environmental impact associated with the proposed exemption, any alternative to the proposed exemption will have either no significantly different environmental impact or greater environmental impact.

The principal alternative would be to deny the requested exemption. This would not reduce environmental impacts as a result of plant operations.

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 April 24, 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

Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed exemption.

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the

quality of the human environment.

For further details with respect to this action, see the request for exemption dated September 4, 1996, as supplemented February 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 24th day of April, 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

Handwritten signature of Mark Reinhart, appearing as 'M. Reinhart' with a stylized flourish.

Mark Reinhart, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation