

For the Nuclear Regulatory Commission.
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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-338 and 50-339]

Virginia Electric and Power Company; Notice of Partial Denial of Amendment to Facility Operating License and Opportunity for Hearing

The U.S. Nuclear Regulatory Commission (the Commission) has partially denied a request by Virginia Electric and Power Company, (licensee) for an amendment to Facility Operating License Nos. NPF-4 and NPF-7 issued to the licensee for operation of the North Anna Power Station, Unit Nos. 1 and 2, located in Louisa County, Virginia. Notice of Consideration of Issuance of this amendment was published in the **Federal Register** on December 4, 1996 (61 FR 64396).

The purpose of the licensee's amendment request was to revise the Technical Specifications (TS) to permit the insertion of four demonstration fuel assemblies into the reactor core of either North Anna 1 or North Anna 2, as described in the licensee's submittal. The four lead test assemblies, fabricated by Framatome Cogema Fuels, will incorporate several advanced design features, including: a debris filter bottom nozzle, mid-span mixing grids, a floating top end grid, a quick disconnect top nozzle, and use of advanced zirconium alloys for fuel assembly structural tubing and for fuel rod cladding. A portion of the amendment request included a proposal to amend Section 6.9.1.7.b by adding one sentence. Because the non-specific sentence does not specify methods used to determine core operating limits, the proposal to add the sentence to the TS is denied.

The NRC staff has concluded that the licensee's request cannot fully be granted. The licensee was notified of the Commission's partial denial of the proposed change by a letter dated May 9, 1997.

By June 16, 1997 the licensee may demand a hearing with respect to the denial described above. Any person whose interest may be affected by this proceeding may file a written petition for leave to intervene.

A request for hearing or petition for leave to intervene must be filed with the

Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch, or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, by the above date.

A copy of any petitions should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to Michael W. Maupin, Esq., Hunton and Williams, Riverfront Plaza, East Tower, 951 E. Byrd Street, Richmond, Virginia 23219, attorney for the licensee.

For further details with respect to this action, see (1) the application for amendment dated September 4, 1996, as supplemented February 3, 1997, and (2) the Commission's letter to the licensee dated May 9, 1997.

These documents are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, 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 9th day of May 1997.

For the Nuclear Regulatory Commission.

Mark Reinhart,

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

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-338 and 50-339]

Virginia Electric and Power Company; North Anna Power Station, Units 1 and 2; Exemption

I

Virginia Electric and Power Company (the licensee) is the holder of Facility Operating License Nos. NPF-4 and NPF-7, which authorize operation of North Anna Power Station, Unit Nos. 1 and 2 (NPS1&2). The licenses provide, among other things, that the licensee be subject to all rules, regulations, and Orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility consists of two pressurized water reactors at the licensee's site located in Louisa County, Virginia.

II

By letter dated September 4, 1996, as supplemented February 3, 1997, the licensee requested an exemption to 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 that would enable the use of four demonstration fuel assemblies 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 regulations cited above refer to pressurized water reactors fueled with uranium oxide pellets within cylindrical zircaloy or ZIRLO cladding. The four demonstration assemblies to be used during these fuel cycles contain fuel rods with zirconium-based claddings that are not chemically identical to zircaloy or ZIRLO.

Since 10 CFR 50.46 and Appendix K to 10 CFR Part 50 identify requirements for calculating emergency core cooling system (ECCS) performance for reactors containing fuel with zircaloy or ZIRLO cladding, and 10 CFR 50.44 relates to the generation of hydrogen gas from a metal-water reaction with reactor fuel having zircaloy or ZIRLO cladding, an exemption is needed to place the four demonstration assemblies containing fuel rods with advanced zirconium-based cladding in the core.

III

Title 10 of the Code of Federal Regulations at 50.12(a)(2)(ii) enables the Commission to grant an exemption from the requirements of Part 50 when special circumstances are present such that application of the regulation in the particular circumstances would not serve the underlying purpose of the rule, or is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.46 and 10 CFR Part 50, Appendix K, is to establish requirements for the calculation of ECCS performance. The licensee has performed a calculation demonstrating adequate ECCS performance for NPS1&2 and has shown that the four demonstration assemblies do not have a significant impact on that previous calculation. The peak cladding temperature of the demonstration

assemblies was significantly lower than the resident Westinghouse fuel. Using the Baker-Just equation, the local cladding oxidation of the demonstration assemblies was less than 5%. Also, the maximum hydrogen generation was unchanged with the inclusion of four demonstration assemblies. Therefore, the coolable geometry was maintained following a loss-of-coolant accident (LOCA).

Paragraph I.A.5 of Appendix K to 10 CFR part 50 states that the rates of energy release, hydrogen concentration, and cladding oxidation from the metal-water reaction shall be calculated using the Baker-Just equation. Since the Baker-Just equation presumes the use of zircaloy clad fuel, strict application of the rule would not permit use of the equation for advanced zirconium-based alloys for determining acceptable fuel performance. The underlying intent of this portion of the Appendix, however, is to ensure that analysis of fuel response to LOCAs is conservatively calculated. Due to the similarities in the composition of the advanced zirconium-based alloys and Zircaloy/ZIRLO, the application of the Baker-Just equation in the analysis of advanced zirconium-based clad fuel will conservatively bound all post-LOCA scenarios. Thus, the underlying purpose of the rule will be met. Thus, special circumstances exist to grant an exemption from Appendix K to 10 CFR part 50 that would allow the licensee to apply the Baker-Just equation to advanced zirconium-based alloys. Only LOCA methods approved by NRC were used to perform the calculations which demonstrated adequate safety performance of ECCS systems. These include: (1) RSG LOCA-B&W LOCA evaluation model, (BAW 10168, Rev. 3), (2) RELAP5/MOD2-B&W code, (BAW 10164, Rev. 3), (3) the BEACH implementation of RELAP 5, (BAW-10166, Rev. 4), and (4) REFLOD3B (BAW-10171-PA, Rev. 3). The licensee documented calculations which demonstrate that existing North Anna calculations based on the current fuel design conservatively bound the LOCA performance of the demonstration assemblies as calculated by NRC-approved methods. Results of comparative LOCA calculations with the same plant operating parameters demonstrated that the LOCA calculational methods used are acceptable for the demonstration assemblies at North Anna. As such, the licensee has achieved the underlying purpose of 10 CFR 50.46 and 10 CFR part 50, Appendix K. The underlying purpose of 10 CFR 50.44 is to ensure

that means are provided for the control of hydrogen gas that may be generated following a postulated LOCA accident. The licensee has provided means for controlling hydrogen gas and has previously considered the potential for hydrogen gas generation stemming from a metal-water reaction. The small number of fuel rods in the four demonstration assemblies containing advanced zirconium-based claddings in conjunction with the chemical similarity of the advanced claddings to zircaloy and ZIRLO ensures that previous calculations of hydrogen production resulting from a metal-water reaction would not be significantly changed. As such, the licensee has achieved the underlying purpose of 10 CFR 50.44.

The four demonstration assemblies that will be placed in the NPS-1 reactor during Cycles 13, 14, and 15, or in NPS-2 under constraints previously described, meet the same design bases as the fuel in the reactor during previous cycles. No safety limits or setpoints have been altered as a result of the use of the four demonstration assemblies. The demonstration assemblies will be placed in core locations that will not experience limiting power peaking during the aforementioned operating cycles. The advanced claddings have been tested for corrosion resistance, tensile and burst strength, and creep characteristics. The results indicate that the advanced claddings are safe for reactor service.

IV

For the foregoing reasons, the NRC staff has concluded that the use of the four demonstration assemblies in the NPS-1 reactor during Cycles 13, 14, and 15, or in NPS-2 under constraints previously described, will not present an undue risk to public health and safety and is consistent with the common defense and security. The NRC staff has determined that there are special circumstances present as specified in 10 CFR 50.12(a)(2)(ii) such that application of 10 CFR 50.46, 10 CFR Part 50, Appendix K, and 10 CFR 50.44 to only apply to zircaloy or ZIRLO is not necessary in order to achieve the underlying purpose of these regulations.

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or common defense and security and is otherwise in the public interest, and hereby grants Virginia Electric and Power Company an exemption from the requirements of 10 CFR 50.44, 10 CFR 50.46, and Appendix K to 10 CFR Part 50 in that explicit

consideration of the advanced zirconium-based clad fuel present within the four demonstration assemblies is not required in order to be in compliance with these regulations. This exemption applies only to the four demonstration assemblies for the three total operating cycles for which these assemblies will be in the NPS-1 and NPS-2 reactor cores under the constraints stated in Section II above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the quality of the human environment (62 FR 23504).

This exemption is effective upon issuance.

Dated at Rockville, Maryland this 9th day of May 1997.

For the Nuclear Regulatory Commission.

Samuel J. Collins,

Director, Office of Nuclear Reactor Regulation.

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NUCLEAR REGULATORY COMMISSION

[Docket No. 50-305]

Wisconsin Public Service Company; Wisconsin Power and Light Company; Madison Gas and Electric Company; Notice of Consideration of Issuance of Amendment To Facility Operating License, Proposed No Significant Hazards Consideration Determination, and Opportunity for a Hearing

The United States Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-43 issued to Wisconsin Public Service Corporation, Wisconsin Power and Light Company, and Madison Gas and Electric Company (the licensee), for operation of the Kewaunee Nuclear Power Plant, located in Kewaunee County, Wisconsin.

The proposed amendment would change the main steam isolation valve (MSIV) closure time assumption referenced in the Basis for Technical Specification (TS) 4.7.

Before issuance of the proposed license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations.

The Commission has made a proposed determination that the amendment request involves no significant hazards consideration. Under the Commission's regulations in 10 CFR