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Dated at Rockville, Maryland, this 23rd day of September 1997.

For The Nuclear Regulatory Commission.

L. Raghavan, Sr.,

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Nuclear Reactor Regulation.*

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NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-338]

In the Matter of Virginia Electric and Power Company North Anna Power Station, Unit Nos. 1 and 2; Exemption and 50-339

I

The Virginia Electric and Power Company (the licensee) is the holder of Facility Operating License Nos. NPF-4 and NPF-7, which authorize operation of the North Anna Power Station (NAPS), Unit Nos. 1 and 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

The Code of Federal Regulations at 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify detection, sensitivity and coverage capabilities of the monitors required by 10 CFR 70.24(a). Subsection (a)(3) requires licensees to maintain emergency procedures for each area in which this licensed SNM is handled, used, or stored.

Subsection (d) of 10 CFR 70.24 states that any licensee who believes that there is good cause why it should be granted an exemption from all or part of 10 CFR 70.24 may apply to the Commission for

such an exemption and shall specify the reasons for the relief requested.

III

By letter dated January 28, 1997, as supplemented March 24, 1997, Virginia Electric and Power Company requested an exemption from 10 CFR 70.24(a). The Commission technical staff has reviewed the licensee's submittal and has determined that inadvertent criticality is not likely to occur in SNM handling or storage areas at NAPS, Units 1 and 2.

At North Anna, SNM is present principally as nuclear fuel. Other small quantities of SNM are used on site. However, the total amount used in non-fuel applications is significantly less than the quantity specified in 10 CFR 70.24(a). The small quantity of non-fuel SNM present, and the form in which it is stored and used, precludes an inadvertent criticality. Therefore, SNM used as nuclear fuel is the only material on site subject to the requirements of 10 CFR 70.24(a).

Nuclear fuel is stored in the new fuel storage area and the spent fuel pool. New fuel is stored dry (in air) in the new fuel storage area. The spent fuel pool is used to store irradiated fuel under water after its discharge from the reactor, and new fuel prior to loading into the reactor.

The new fuel storage area is used to receive and store new fuel in a dry condition upon arrival on site and prior to loading in the reactor or spent fuel pool. The spacing between new fuel assemblies in the storage racks is sufficient to maintain the array in a subcritical condition even under accident conditions assuming the presence of moderator. The maximum nominal enrichment of 4.3 wt% U-235 for the new fuel assemblies results in a maximum k_{eff} of less than 0.95 under conditions of accidental flooding by unborated water and k_{eff} less than 0.98 under conditions of low-density optimum moderation. The staff has found the design of the licensee's new fuel storage racks to be adequate to store fuel enriched to 4.3 wt% U-235.

Consistent with Technical Specification Section 5.6.1.1, the spent fuel pool is designed to store the fuel in a geometric array that precludes criticality. The spent fuel racks are designed such that the effective neutron multiplication factor, k_{eff} , will remain less than or equal to 0.95 under all normal and accident conditions for fuel of maximum nominal enrichment of 4.3 wt% U-235.

Nuclear fuel is moved between the shipping container, the new fuel storage racks, the reactor vessel, and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns.

The purpose of the criticality monitors required by 10 CFR 70.24 is to ensure that if a criticality were to occur during the handling of nuclear material, personnel would be alerted to that fact and would take appropriate action. Although the staff has determined that such an accident is not likely to occur, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors have associated area alarms and control room annunciators and would detect excessive radiation levels and will alert personnel to allow them to initiate appropriate emergency procedures and safety actions. The low probability of an inadvertent criticality together with the licensee's adherence to General Design Criterion 63 constitute good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV

The Commission has determined that, pursuant to 10 CFR 70.14, this exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest; therefore, the Commission hereby grants Virginia Electric and Power Company the exemption from the requirements of 10 CFR 70.24(a) for North Anna Power Station, Unit Nos. 1 and 2, relating to criticality accident monitoring requirements.

V

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant adverse environmental impact (62 FR 49540).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 23rd day of September 1997.

For The Nuclear Regulatory Commission.

Frank J. Miraglia,

Acting Director, Office of Nuclear Reactor Regulation.

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