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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 01 1979

Docket Nos. 50-338
50-339

Mr. W. L. Proffitt
Senior Vice President-Power
Operations
Virginia Electric & Power Company
P. O. Box 26666
Richmond, Virginia 23261

Dear Mr. Proffitt:

SUBJECT: ENVIRONMENTAL IMPACT APPRAISAL REGARDING EXPANSION OF THE SPENT FUEL POOL AT NORTH ANNA POWER STATION UNITS 1 AND 2

Your letter of May 11, 1979, amending the application to expand the spent fuel pool capacity at North Anna Units 1 and 2, includes a correction of the stretch rating from 2990 MW to 2900 MW. We understand that the 2990 figure was an error in the Summary of Proposed Modification to the Spent Fuel Pool rather than a change in design capacity. Consequently, we are making a similar correction in Section 3.0 on page 3 of our Environmental Impact Appraisal (EIA) dated April 2, 1979, which was sent to you with a letter dated April 6, 1979.

In making a similar change in the footnote on page 6 of EIA, we discovered that the information given in the footnote was in error and we have corrected it. Copies of corrected pages 3 and 6 are enclosed, with a revised cover sheet.

These errata corrections have no effect on the analyses and conclusions presented in the EIA.

Sincerely,

Wm. H. Regan, Jr., Chief
Environmental Projects Branch 2
Division of Site Safety and
Environmental Analysis

Enclosure:
As stated

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# ENVIRONMENTAL IMPACT APPRAISAL
# BY THE OFFICE OF NUCLEAR REACTOR REGULATION
# RELATIVE TO A PROPOSED INCREASE IN STORAGE CAPACITY
# OF THE SPENT FUEL POOL
# NORTH ANNA POWER STATION, UNITS 1 AND 2
# VIRGINIA ELECTRIC AND POWER COMPANY
# DOCKET NOS. 50-338 AND 50-339
# FACILITY OPERATING LICENSE NO. NPF-4

April 2, 1979

(with corrections of errata on pages 3 and 6)

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refueling cycles. If longer refueling cycles, such as the 18-month cycles at the Surry plant, were also adopted after the first two cycles, the staff estimates that operation with full-core off-load capability could be extended approximately one year beyond 1987. However, without expansion of the SFP, adoption of 18-month cycles would not extend the full-core off-load capability beyond the fall of 1981. Thus, additional storage capacity is needed even if extended refueling cycles are adopted.

## 3.0 THE FACILITY

Units 1 and 2 each have a pressurized water reactor (PWR) with a maximum design power level of 2900 megawatts thermal (MWt).[1] Steam generated with the reactor heat can be used in turbine-generators to produce up to 980 megawatts electrical (MWe) per unit. Unit 1 is presently licensed to operate at a maximum steady-state reactor power level of 2775 MWt, which provides an electrical output of approximately 942 MWe.

Principal features of the facility which are pertinent to this evaluation are briefly described below for convenience in following the discussion in subsequent sections of this appraisal. More details are presented in the FES and the Addendum mentioned in Section 1 and in the Safety Evaluation Report (SER) issued by the staff in June 1976.

### 3.1 Fuel Inventory

The weight of fuel, as $UO_2$, in each reactor is approximately 181,200 pounds. The fuel is contained in long sealed tubes called fuel rods. A cluster of 264 fuel rods arranged in a 17 x 17 array makes up each of the 157 fuel assemblies in a reactor.

The proposed modification of the SFP would not change the quantity of uranium fuel used in the reactor over the anticipated operating life of the facility and would not change the rate at which spent fuel is generated by the facility. The added storage capacity would increase the number of spent fuel assemblies that could be stored in the SFP and the length of time that some of the fuel assemblies could be stored in the pool.

### 3.2 Purpose of the Spent Fuel Pool

Spent fuel assemblies are intensely radioactive due to their fresh fission product content when initially removed from the core and they have a high thermal output. The SFP was designed for storage of these assemblies to allow for radioactive and thermal decay prior to shipping them to a reprocessing facility. The major portion of decay occurs in the first 150 days following removal from the reactor core. After this period, the spent fuel assemblies may be withdrawn and

same as that previously considered, since the design temperature limits and rate of water circulation through the pool remain the same.

However, storing additional fuel in the SFP would increase the heat load transferred to the closed-loop component cooling water system, and then to the service water system by a maximum of 5.6 x $10^6$ Btu/hr. Dissipation of this heat by evaporation from the service water reservoir would require approximately 12 gpm of additional makeup water. This is a very small amount compared to the station's total water requirements (about 1,905,600 gpm) and would not have noticeable effects on Lake Anna.

## 4.3 Nonradiological Effluents

No additional chemicals or biocides are to be used because of the SFP expansion. Therefore, the only nonradiological effluent attributable to the amendment would be the additional heat load of 5.6 x $10^6$ Btu/hr dissipated from the service water system. This is about 5.5 percent more than the 103.1 x $10^6$ Btu/hr heat load on the service water reservoir under normal operation and about 4.6 percent of the 122.5 x $10^6$ Btu/hr heat load under abnormal conditions (unloading a full core), without the SFP modification. The incremental effects of evaporating 12 gpm to dissipate this additional heat (Sect. 4.2) would be minimal. The service water reservoir is located onsite near the main structures of the station (FES Fig. 3.1) and any additional atmospheric effects of its operation such as fogging and icing are unlikely to occur offsite.

There is provision for discharge of the service water system to the WHTF if the need should arise. The addition of 5.6 x $10^6$ Btu/hr to the total discharge from Units 1 and 2 (13.7 x $10^9$ Btu/hr)* would be an increase of only 0.04%. This would not have noticeable incremental effects on aquatic biota or the environment.

## 4.4 Radiological Impacts

### 4.4.1 Introduction

The potential offsite radiological environmental impacts associated with the expansion of the spent fuel storage capacity were evaluated and determined to be environmentally insignificant as addressed below.

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*The applicant's submittal of May 1, 1978, indicated 13.7 x $10^9$ Btu/hr in Table 7-2 as the total heat discharged to the environment; of this total, 13.15 x 10 Btu/hr is discharged from the turbine steam condensers to the WHTF, 109 x $10^6$ Btu/hr from the service water reservoir and 350 x $10^6$ Btu/hr from the bearing cooling towers are dissipated to the atmosphere.