VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

March 2, 2001

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No.	01-051A
NL&OS/GSS/ETS	R1
Docket Nos.	50-338/-339
License Nos.	NPF-4/-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATION CHANGES
INCREASED FUEL ENRICHMENT AND
SPENT FUEL POOL SOLUBLE BORON AND FUEL BURNUP CREDIT
REQUEST FOR ADDITIONAL INFORMATION

In a September 27, 2000 letter (Serial No. 00-491), Virginia Electric and Power Company (Dominion) requested amendments, in the form of changes to the Technical Specifications to Facility Operating Licenses Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes would 1) increase the fuel enrichment limit to 4.6 weight percent $Uranium^{235}$, 2) establish Technical Specifications Limiting Conditions for Operations for Spent Fuel Pool (SFP) boron concentration and fuel storage restrictions, and 3) revise the discussion of the allowance for uncertainties in the calculation for K_{eff} in the SFP criticality calculation. In a February 14, 2001 telephone conference call to discuss the SFP boron dilution analysis, the NRC staff requested additional information to complete their review. The attachment to this letter provides the additional information requested on potential SFP dilution sources.

If you have any further questions or require additional information, please contact us.

Very truly yours,

W R Matthews

William R. Matthews
Vice President – Nuclear Operations

Attachment

Commitments made in this letter: None

A001

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. M. J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

Commissioner
Bureau of Radiological Health
1500 East Main Street
Suite 240
Richmond, VA 23218

Mr. J. E. Reasor, Jr.
Old Dominion Electric Cooperative
Innsbrook Corporate Center
4201 Dominion Blvd.
Suite 300
Glen Allen, Virginia 23060

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by William R. Matthews, who is Vice President - Nuclear Operations, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 2nd day of March, 2001.

My Commission Expires: May 31, 2002.

Vicki L. Hull
Notary Public

(SEAL)

ATTACHMENT

Proposed Technical Specification Change
Increased Fuel Enrichment and Spent Fuel Pool Boron Credit
Additional Information for Spent Fuel Pool Boron Dilution Analysis

Virginia Electric and Power Company
(Dominion)
North Anna Power Station Units 1 and 2

Response to NRC Request Regarding Ultimate Volumes of Water Available During a Spent Fuel Pool Dilution Event

Introduction

Virginia Electric and Power Company (Dominion) submitted a Technical Specification Change Request to the NRC for review by letter dated September 27, 2000. The submittal included an evaluation of the establishment of Technical Specifications requirements for Spent Fuel Pool (SFP) soluble boron concentration and fuel assembly loading restrictions based on fuel assembly burnup and enrichment.

As part of the evaluation the dilution of the spent fuel pool was analyzed. This evaluation included the identification of the likely dilution sources and approximate flow rates for each source. In a February 14, 2001 telephone conference call, the NRC requested that Dominion provide the volume of water that feeds each of the dilution sources. Table 1 lists the potential dilution flow paths, approximate flow rates and volumes of water contained within each dilution source.

Table 1: North Anna Spent Fuel Pool (SFP) Dilution Flow Paths and Sources

Dilution Flow Path	Approximate Flow Rate [GPM]	Hours to Dilute SFP	Ultimate Dilution Source	Available Water Volume [gal]
Fire Protection Emergency SFP Fill Valve	400	11	Lake Anna	Infinite [1]
Fire Protection Pipe Break	350	13	Lake Anna	Infinite [1]
Chemical Volume and Control System Makeup Valve Open	200	22	Primary Grade (PG)-Reactor Makeup Tanks	360,000 [3]
Primary Grade Water System Open Demineralizer Valve	200	22	PG Reactor Makeup Tanks	360,000 [2]
Component Cooling Water HX Tube Leak	100	44	Condensate Storage Tank	600,000 [4]
Primary Grade Water System Hose Connections	35	127	PG -Reactor Makeup Tanks	360,000 [2]
Primary Grade Water System Pipe Break	35	127	PG- Reactor Makeup Tanks	360,000 [2]
Plant Heating System Steam Line Break	35	127	Condensate Storage Tank	600,000 [5]

General Note:

To dilute the spent fuel pool from an initial boron concentration of 2300 ppm to a final boron concentration of 1200 ppm requires the addition of 266,542 gal of dilute water to the spent fuel pool. It is non-credible that such a large volume of water could be added to the spent fuel pool without operator observation and intervention. The spent fuel pool high level alarm actuates with a maximum addition of 13,400 gallons to the spent fuel pool. The water in the spent fuel pool would begin to overflow with the addition of 23,400 gallons of water. Overflowing water would collect in the fuel building sump that would eventually actuate a fuel building sump high level alarm. In addition, procedures require that plant personnel perform rounds into the spent fuel pool enclosure once every six hours. This allows for at least one operator round even in the worst case dilution scenario.

Note 1:

The fire protection valves and pipes in the fuel building receive their water from the station fire main. Leak-by or inadvertent opening of the fire protection isolation valve into the spent fuel pool from the fire protection system would cause a reduction in the fire main pressure. A reduction in fire main pressure triggers an auto start of the motor driven fire pump that draws suction from Lake Anna. Essentially, Lake Anna has an infinite volume of water that could be deposited into the spent fuel pool. However, for Lake Anna water to get into the spent fuel pool, the station fire pumps have to start. The auto start of a fire pump will cause the actuation of an alarm in the control room. This is in addition to other indications of a spent fuel pool overflow event such as the spent fuel pool high level alarm, the fuel building sump high level alarm and operator observation. Therefore, it is not credible that Lake Anna water would dilute the spent fuel pool without operator knowledge and subsequent intervention.

Note 2:

There are two primary grade reactor makeup tanks of 180,000 gal of water each. These tanks are used to store pure water for the primary grade water system and both could be used as a dilution source for an open valve or a pipe break in the primary grade water system in the fuel building. Therefore, the dilution source volume from the primary grade reactor makeup water tanks is 360,000 gal.

Note 3:

The makeup water for the chemical volume and control system is fed from the primary grade water system. Makeup to the SFP is detected by the main control room CVCS blender flow indication system. Additionally, alarms on the SFP would alert the operators of a valve misposition. As discussed in note 2, the dilution source for the primary grade water system are the primary grade reactor makeup tanks with a combined volume of 360,000 gal.

Note 4:

The component cooling water system provides the cooling water for the spent fuel pool heat exchangers. Since the component cooling water is at a higher pressure than the spent fuel pool water, a tube leak in the heat exchanger could result in a dilution of the spent fuel pool. 3120 gal of water are stored in the surge tank of the component cooling water system to maintain an appropriate suction head on the component cooling water pumps. The makeup for this surge tank and thus the component cooling water system is via the condensate system. The ultimate dilution source for the condensate system is the condensate storage tank. There are two condensate storage tanks of 300,000 gal each that are normally cross-tied at the outlet. Therefore, the dilution source volume for the component cooling water system is 600,000 gal. However, there are three normally closed valves that isolate the condensate system from the component cooling water system. These valves must be opened manually to add makeup water to the surge tank of the component cooling water system from the condensate system. These valves are not actuated automatically. It is not credible that dilute water would flow through these three valves without operator intervention.

Note 5:

The plant heating system receives its steam from the plant auxiliary steam system. The makeup source for the auxiliary steam system is ultimately the condensate storage tank. As discussed in note 4, the dilution source volume in the condensate storage tanks is 600,000 gal. However, the small leak rate of the plant heating system steam line break of 35 gpm into the spent fuel pool would require 127 hours or over 5 days to dilute the spent fuel pool.