

December 30, 1986

Docket Nos. 50-338  
and 50-339

DISTRIBUTION

Docket File	J. Partlow
NRC PDR	T. Barnhart (8)
Local PDR	W. Jones
PAD#2 Rdg	E. Butcher
T. Novak	N. Thompson, DHFT
D. Miller	V. Benaroya
L. Engle	Tech Branch
OGC-Bethesda	ACRS (10)
L. Harmon	C. Miles, OPA
E. Jordan	L. Tremper, LFMB
B. Grimes	Gray File

Mr. W. L. Stewart  
Vice President - Nuclear Operations  
Virginia Electric and Power Company  
Post Office Box 26666  
Richmond, Virginia 23261

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment Nos. 89 and 75 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The amendments revise the licenses in response to your letter dated August 22, 1986, as supplemented December 5, and December 10, 1986.

The amendments change the license expiration date for NA-1 from February 18, 2011, to April 1, 2018, and change the license expiration date for NA-2 from February 19, 2011 to August 21, 2020. The amendments are consistent with Section 103.C of the Atomic Energy Act and Sections 50.51, 50.56 and 50.57 of the Commission's regulations.

A copy of the Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

/s/

Leon B. Engle, Project Manager  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Enclosure:

1. Amendment No. 89 to NPF-4
2. Amendment No. 75 to NPF-7
3. Safety Evaluation

cc w/enclosures:  
See next page

\*PREVIOUS CONCURRENCE SEE DATE

LA:PAD#2\*  
DMiller  
12/8/86

PM:PAD#2\*  
LEngle:hc  
12/8/86

OGC  
12/19/86

PD:PAD#2\*  
LRubenstein  
12/8/86

D:DPLA  
TNovak  
12/21/86

*As developed with changes to Safety evaluation.*

8701090176 861230  
PDR ADOCK 05000338  
PDR

Mr. W. L. Stewart  
Virginia Electric & Power Company

North Anna Power Station  
Units 1 and 2

cc:

Richard M. Foster, Esq.  
Cockrell, Quinn & Creighton  
516 Cherry Tower  
920 South Cherry Street  
Denver, Colorado 80222

Atomic Safety and Licensing Appeal  
Board Panel  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Michael W. Maupin, Esq.  
Hunton, Williams, Gay and Gibson  
P. O. Box 1535  
Richmond, Virginia 23212

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Office of Executive Director  
for Operations  
101 Marietta Street N.W., Suite 3100  
Atlanta, Georgia 30323

Mr. W. T. Lough  
Virginia Corporation Commission  
Division of Energy Regulation  
P. O. Box 1197  
Richmond, Virginia 23209

Mr. E. W. Harrell  
P. O. Box 402  
Mineral, Virginia 23117

Ellyn R. Weiss, Esq.  
Harmon, Weiss and Jordan  
2001 S Street NW  
Washington, DC 20009

Old Dominion Electric Cooperative  
c/o Executive Vice President  
Innsbrook Corporate Center  
4222 Cox Road, Suite 102  
Glen Allen, Virginia 23060

Mr. J. T. Rhodes  
Senior Vice President - Power Ops.  
Virginia Electric and Power Co.  
Post Office Box 26666  
Richmond, Virginia 23261

Mr. William C. Porter, Jr.  
County Administrator  
Louisa County  
P. O. Box 160  
Louisa, Virginia 23093

Mr. Patrick A. O'Hare  
Office of the Attorney General  
Supreme Court Building  
101 North 8th Street  
Richmond, Virginia 23219

Resident Inspector/North Anna  
c/o U.S. NRC  
Senior Resident Inspector  
Route 2, Box 78  
Mineral, Virginia 23117

Mr. Paul W. Purdom  
Environmental Studies Institute  
Drexel University  
32nd and Chestnut Streets  
Philadelphia, Pennsylvania 19104



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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 89  
License No. NPF-4

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company, et al., (the licensee) dated August 22, 1986, as supplemented December 5, and December 10, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

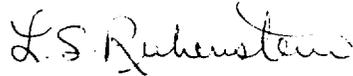
8701090190 861230  
PDR ADOCK 05000338  
P PDR

2. Accordingly, Paragraph 2.H is hereby amended to read:

2.H This license is effective as of the date of issuance and shall expire at midnight on April 1, 2018.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Lester S. Rubenstein, Director  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Date of Issuance: December 30, 1986



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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 75  
License No. NPF-7

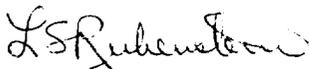
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company, et al., (the licensee) dated August 22, 1986, as supplemented December 5, and December 10, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, Paragraph 2.H is hereby amended to read:

2.H This license is effective as of the date of issuance and shall expire at midnight on August 21, 2020.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Lester S. Rubenstein, Director  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Date of Issuance: December 30, 1986



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 89 AND 75 TO  
FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7  
VIRGINIA ELECTRIC AND POWER COMPANY  
OLD DOMINION ELECTRIC COOPERATIVE  
NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2  
DOCKET NOS. 50-338 AND 50-339

INTRODUCTION

By application dated August 22, 1986, and as supplemented by letters dated December 5, and December 10, 1986, the Virginia Electric and Power Company (the licensee) requested amendments to Facility Operating Licenses No. NPF-4 and No. NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2), respectively. The proposed amendments would change the license expiration date for NA-1 from February 18, 2011 to April 1, 2018, and change the license expiration date for NA-2 from February 19, 2011, to August 21, 2020.

DISCUSSION

Section 103.c of the Atomic Energy Act of 1954 provides that a license is to be issued for a specified period not exceeding 40 years. 10 CFR 50.51 specifies that each license will be issued for a fixed period of time not to exceed 40 years from date of issuance. 10 CFR 50.56 and 10 CFR 50.57 allow the issuance of an operating license pursuant to 10 CFR 50.51 after the construction of the facility has been substantially completed, in conformity with the construction permit and when other provisions specified in 10 CFR 50.57 are met.

The currently licensed term for NA-1&2 is 40 years from the date of issuance of the construction permits (February 19, 1971). Accounting for the time that was required for plant construction, this represents an effective operating license term of 33 years for NA-1 and 30 years and 6 months for NA-2. Consistent with Section 103.c of the Atomic Energy Act and Sections 50.51, 50.56 and 50.57 of the Commission's regulations, the licensee, by its application of August 22, 1986, seeks extensions of the operating license terms for NA-1&2 such that the fixed period of the licenses would be 40 years from the date of operating license issuance.

EVALUATION

The Commission has reviewed the licensee's application for amendments and previous licensing documents, including the NA-1&2 Final Safety Analysis Report

(FSAR), the NA-1&2 Safety Evaluation Report (SER) with its supplements, and more recent Commission policy and documents, to determine the effects of the requested extension upon safety. The Commission's evaluation considered the potential effects to systems and equipment, including effects due to aging of electrical equipment important to safety and changes in the fracture toughness properties of reactor vessel beltline materials due to neutron irradiation. The evaluation also included the effects of updated population estimates upon the previous determination of exclusion area, low population zone (LPZ) and population center distance, in accordance with 10 CFR 100. Other areas of the Commission's previous safety review of the NA-1&2 Station are not affected by the requested extension since NA-1&2 was originally designed, constructed and has been evaluated by the Commission on the basis of a 40 year service life.

### 1. Updated Population Estimates

The NA-1&2 Safety Evaluation Report (SER), issued June 1976, discussed the NRC findings regarding the 10 CFR Part 100 siting criteria for the NA-1&2 Exclusion Area, Low Population Zone, and nearest population centers in Section 2.1. The licensee's request to extend the license periods on these criteria are discussed below:

Exclusion Area: The exclusion area is discussed in the NA-1&2 SER, Section 2.1.2. The Exclusion Area consists of the licensee-owned property in approximately a 5000 ft. radius (min. distance 4427 ft.) of the station. The licensee owns all of the land, including the plant access road, within the Exclusion Area, as well as the mineral rights to the land. The licensee has the authority to control all activities within the Exclusion Area and anticipates no changes to the Exclusion Area boundary during the extended license period. The Exclusion Area remains unchanged from that discussed in Section 2.1.2 of the NA-1&2 SER and therefore the NRC conclusions in the SER regarding the Exclusion Area also remain unchanged.

Low Population Zone: The Low Population Zone (LPZ) is described in Section 2.1.3 of the NA-1&2 SER. NA-1&2 LPZ has an outer radius of six miles. The present and projected populations for the 5, 10, 30 and 50 mile radii for the years 1970, 1990, and 2020 are given in Table 2.1 of the NA-1&2 SER. The data in Table 2.1 assumes an annual population growth rate of about 1.5%. This assumption is consistent with that estimated by the Commonwealth of Virginia (October 1986) for the approximately 50 mile radius around North Anna.

Based on available census data, the permanent 1980 population within the 10 mile radius is 14,610. The extrapolated population from the NA-1&2 SER, Table 2.1 for the 10 mile radius in 1980 is 9191. Thus, the actual population in this instance (where comparable data is available) shows an actual population about 59% greater than the projected value in the SER. However, based on more general population trends and the reasons listed below, the staff expects no significant increase in LPZ population during the extended license period and believes that there will continue to be reasonable assurance that appropriate measures can be taken on behalf of the population within the LPZ in the event of an accident.

One, consistent with the original NA-1&2 SER evaluation, the area within five miles (LPZ equals six miles) of the plant remains rural, extensively wooded, interspersed with farms and is expected to remain predominantly rural during the extended license period. Two, the licensee has established a 10 mile radius Emergency Planning Zone, enveloping the LPZ, over which the licensee provides reasonable assurance that protective measures could be taken on behalf of the population in the event of an accident. Three, the NRC Safety Evaluation supporting license amendment numbers 84 and 71 for NA-1&2, respectively, and dated August 25, 1986, regarding the NA-1&2 core uprate, considered the radiological consequences of accidents analyzed in the NA-1&2 UFSAR (including consideration of the current LPZ), and found them to remain bounding. Thus, no change to the LPZ as a result of the core uprate was required.

Based on the above, the staff concludes that there continues to be reasonable assurance that appropriate measures can be taken on behalf of the population within the LPZ in the event of an accident and that the NRC conclusions as stated in the NA-1&2 SER, Section 2.1.3, remain unchanged as a result of the extended license period.

Major Population Centers: Major population centers are discussed in Section 2.1.3 of the NA-1&2 SER. The current nearest major population center, as defined in 10 CFR Part 100 (containing more than 25,000 residents), is Fredericksburg, Virginia, located 24 miles northeast of the site. Thus, the nearest population center remains the same as that identified in Section 2.1.3 of the NA-1&2 SER and the nearest population center distance continues to be greater than one and one-third times the distance from the reactors to the outer boundary of the LPZ.

Based on the Commonwealth of Virginia population estimates (October 1986), Fredericksburg is expected to remain the nearest population center throughout the extended license period for NA-1&2 and therefore the conclusions in Section 2.1.3 of the NA-1&2 SER remain unchanged.

## 2. Effects Upon System and Equipment

The licensee's request for extension of the operating licenses is based on the fact that a 40-year service life was considered during the design and construction of the plant. Although this does not mean that some components will not wear out during the plant lifetime, design features were incorporated which maximize the inspectability of structures, systems and equipment. Surveillance and maintenance practices which were implemented in accordance with the ASME code and the facility Technical Specifications provide assurance that any unexpected degradation in plant equipment will be identified and corrected.

The design of the reactor vessel and its internals considered the effects of 40 years of operation at full power and a comprehensive vessel material surveillance program is maintained in accordance with 10 CFR Part 50, Appendix H. The staff has completed analyses related to the pressurized thermal shock (PTS) rule, 10 CFR 50.61, for both units which shows that the most critical weld materials for both reactor vessels meet the criterion of 10 CFR 50.61 by a large margin through the end of the 40-year operating life. In addition to these calculations, surveillance capsules placed inside the reactor vessels provide a means of monitoring the cumulative effects of power operation.

Aging analyses have been performed for all safety-related electrical equipment in accordance with 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants," identifying qualified lifetimes for this equipment. These lifetimes will be incorporated into plant equipment maintenance and replacement practices to ensure that all safety-related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant.

### 3. Findings

Based upon the above, we find that extension of the operating licenses for NA-1&2 to allow a 40-year service life is consistent with the safety analyses for NA-1&2 and that the Commission's previous safety findings are not changed. All issues associated with plant systems and equipment, including aging and changes in fracture toughness properties of materials, have been addressed and are acceptable for 40 years of operation. The site continues to meet the guidelines of 10 CFR 100. Accordingly, we find the proposed change to the expiration dates of the NA-1&2 Facility Operating Licenses to be acceptable.

### ENVIRONMENTAL CONSIDERATION

A Notice of Issuance of an Environmental Assessment and Finding of No Significant Impact relating to the proposed extension of facility operating license termination dates for the North Anna Unit Nos. 1 and 2 was published in the Federal Register on December 24, 1986 (51 FR 46737).

### CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: December 30, 1986

Principal Contributor:

L. Engle