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Docket No. 50-338

Mr. R. H. Leasburg
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Leasburg:

The Commission has issued the enclosed Amendment No. 42 to Facility Operating License NPF-4 for the North Anna Power Station, Unit No. 1 (NA-1). The amendment revises the NA-1 Technical Specifications in response to your letter dated June 8, 1982 (Serial No. 327) and in our discussions with you regarding this matter. The amendment is effective as of its date of issuance.

The amendment revises the average reactor coolant system temperature from 580.3°F to 582.8°F at the currently licensed thermal power level of 2785 MWt. The approved increase of 2.5°F in the average reactor coolant system temperature implements Phase I of your NA-1&2 Plant Upgrade Program.

The enclosed Safety Evaluation is applicable for both NA-1&2. However, issuance of the appropriate amendment for NA-2 will be held in abeyance until you are prepared to implement the TS changes on NA-2.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,
Original signed by

Leon B. Engle, Project Manager
Operating Reactors Branch #3
Division of Licensing

Enclosures:
1. Amendment No. 42 to NPF-4
2. Safety Evaluation
3. Notice of Issuance

cc: See next page

*See previous page for concurrence.

OFFICE	ORB#3:DL*	ORB#3:DL*	ORB#3:DL*	AD:OR:DL	OELD		
SURNAME	PMKreutzer	LEngle/pn	RAClark	GCLainas			
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Docket No. 50-338

Mr. R. H. Leasburg
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Leasburg:

The Commission has issued the enclosed Amendment No. to Facility Operating License NPF-4 for the North Anna Power Station, Unit No. 1 (NA-1). The amendment revises the NA-1 Technical Specifications in response to your letter dated June 8, 1982 (Serial No. 327) and in our discussions with you regarding this matter. The amendment is effective as of its date of issuance.

The amendment revises the average reactor coolant system temperature from 580.3°F to 582.8°F at the currently licensed thermal power level of 2785 MWt. The approved increase of 2.5°F in the average reactor coolant system temperature implements Phase I of your NA-1&2 Plant Upgrade Program.

The enclosed Safety Evaluation is applicable for both NA-1&2. However, issuance of the appropriate amendment for NA-2 will be held in abeyance until such time as we hear from you that the NA-2 main steam support modifications have been completed.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Leon B. Engle, Project Manager
Operating Reactors Branch #3
Division of Licensing

Enclosures:
1. Amendment No. to NPF-4
2. Safety Evaluation
3. Notice of Issuance

cc: See next page

OFFICE	ORB#3:DL	ORB#3:DL	ORB#3:DL	AD:OR:DL	OELD		
SURNAME	PMKreutzer	LEngle/pm	RAClark	GCLainas			
DATE	9/24/82	9/24/82	9/24/82	9/..../82	9/..../82		

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

DISTRIBUTION:
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ORB#3 Rdg
PMKreutzer

Docket No. 50-338

Docketing and Service Section
Office of the Secretary of the Commission

SUBJECT: VIRGINIA ELECTRIC AND POWER COMPANY, North Anna Power Station, Unit No. 1.

Two signed originals of the Federal Register Notice identified below are enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (12) of the Notice are enclosed for your use.

☐ Notice of Receipt of Application for Construction Permit(s) and Operating License(s).

☐ Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for Submission of Views on Antitrust Matters.

☐ Notice of Availability of Applicant's Environmental Report.

☐ Notice of Proposed Issuance of Amendment to Facility Operating License.

☐ Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.

☐ Notice of Availability of NRC Draft/Final Environmental Statement.

☐ Notice of Limited Work Authorization.

☐ Notice of Availability of Safety Evaluation Report.

☐ Notice of Issuance of Construction Permit(s).

☐ Notice of Issuance of Facility Operating License(s) or Amendment(s).

☒ Other: Amendment No. 42.
Referenced documents have been provided PDR.

Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure:
As Stated

OFFICE→	ORB#3:DL					
SURNAME→	PMKreutzer/pn					
DATE→	10/4/82					

NRC FORM 102 7—79

Virginia Electric and Power Company

cc:
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Ellyn R. Weiss, Esquire
Sheldon, Harman, Roisman and Weiss
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Resident Inspector/North Anna
c/o U.S.N.R.C.
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Mineral, Virginia 23117

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Mrs. Margaret Dietrich
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Gordonsville, Virginia 22042

Mr. James C. Dunstance
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Commonwealth of Virginia
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Richmond, Virginia 23209

Mrs. June Allen
North Anna Environmental Coalition
8720 Lockmoor Circle
Wichita, Kansas 67207

U.S. Environmental Protection Agency
Region III Office
ATTN: Regional Radiation Representative
Curtis Building
6th and Walnut Streets
Philadelphia, Pennsylvania 19106

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

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

Regional Administrator
Nuclear Regulatory Commission, Region II
Office of Executive Director for Operations
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 42
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 (the licensee) dated June 8, 1982, 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 applications, 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.

DESIGNATED ORIGINAL

Certified By Patricia J. Noonan

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 42, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 4, 1982

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Pages

2-8
2-9
2-10
3/4 2-15

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
13. Steam Generator Water Level--Low-Low	≥ 18% of narrow range instrument span-each steam generator	≥ 17% of narrow range instrument span-each steam generator
14. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	≤ 40% of full steam flow at RATED THERMAL POWER coincident with steam generator water level ≥ 25% of narrow range instrument span--each steam generator	≤ 42.5% of full steam flow at RATED THERMAL POWER coincident with steam generator water level ≥ 24% of narrow range instrument span--each steam generator
15. Undervoltage-Reactor Coolant Pump Busses	≥ 2905 volts-each bus	≥ 2870 volts-each bus
16. Underfrequency-Reactor Coolant Pump Busses	≥ 56.1 Hz - each bus	≥ 56.0 Hz - each bus
17. Turbine Trip		
A. Low Trip System Pressure	≥ 45 psig	≥ 40 psig
B. Turbine Stop Valve Closure	≥ 1% open	≥ 0% open
18. Safety Injection Input from ESF	Not Applicable	Not Applicable
19. Reactor Coolant Pump Breaker Position Trip	Not Applicable	Not Applicable

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

NOTE 1: Overtemperature $\Delta T \leq \Delta T_o \left[K_1 - K_2\left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)(T-T') + K_3(P-P') - f_1(\Delta I)\right]$

where:

ΔT_o = Indicated ΔT at RATED THERMAL POWER

T = Average temperature, °F

T' = Indicated T_{avg} at RATED THERMAL POWER $\leq$ 582.8°F

P = Pressurizer pressure, psig

P' = 2235 psig (indicated RCS nominal operating pressure)

$\frac{1+\tau_1 S}{1+\tau_2 S}$ = The function generated by the lead-lag controller for T_{avg} dynamic compensation

τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg} τ_1 = 25 secs, τ_2 = 4 secs.

S = Laplace transform operator (sec^{-1})

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Operation with 3 Loops	Operation with 2 Loops (no loops isolated)*	Operation with 2 Loops (1 loop isolated)*
K_1 = 1.113	K_1 = ( )	K_1 = ( )
K_2 = 0.0132	K_2 = ( )	K_2 = ( )
K_3 = 0.000628	K_3 = ( )	K_3 = ( )

and f_1 (ΔI) is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for $q_t - q_b$ between - 35 percent and + 7 percent, f_1 (ΔI) = 0 (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of ($q_t - q_b$) exceeds - 35 percent, the ΔT trip setpoint shall be automatically reduced by 1.21 percent of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of ($q_t - q_b$) exceeds + 7 percent, the ΔT trip setpoint shall be automatically reduced by 1.09 percent of its value at RATED THERMAL POWER.

*Values dependent on NRC approval of ECCS evaluation for these operating conditions.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Note 2: Overpower $\Delta T \leq \Delta T_o[K_4 - K_5 \left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 (T-T") - f_2(\Delta I)]$

Where:

ΔT_o	=	Indicated ΔT at RATED THERMAL POWER
T	=	Average temperature, °F
$T"$	=	Indicated T_{avg} at RATED THERMAL POWER $\leq$ 582.8°F
K_4	=	1.088
K_5	=	0.02/°F for increasing average temperature
K_5	=	0 for decreasing average temperatures
K_6	=	0.00119 for $T > T"$; $K_6 = 0$ for $T \leq T"$
$\frac{\tau_3 S}{1+\tau_3 S}$	=	The function generated by the rate lag controller for T_{avg} dynamic compensation
τ_3	=	Time constant utilized in the rate lag controller for T_{avg} τ_3 = 10 secs.
S	=	Laplace transform operator (sec^{-1})
$f_2(\Delta I)$	=	0 for all ΔI

Note 3: The channel's maximum trip point shall not exceed its computed trip point by more than 2 percent span.

TABLE 3.2-1

DNB PARAMETERS

PARAMETER	LIMITS		
	3 Loops In Operation	2 Loops In Operation** & Loop Stop Valves Open	2 Loops In Operation** & Isolated Loop Stop Valves Closed
Reactor Coolant System T_{avg}	$\leq$ 587°F		
Pressurizer Pressure	$\geq$ 2205 psig*		
Reactor Coolant System Total Flow Rate	$\geq$ 278,400 gpm		

*Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% RATED THERMAL POWER per minute or a THERMAL POWER step increase in excess of 10% RATED THERMAL POWER.

**Values dependent on NRC approval of ECCS evaluation for these conditions

LIMITING CONDITION FOR OPERATION

3.2.6 The axial power distribution shall be limited by the following relationship:

$$[F_j(Z)]_S = \frac{[2.14]\ [K(Z)]}{(\overline{R}_j)(P_L)(1.03)(1 + \sigma_j)(1.07)}$$

Where:

a. $F_j(Z)$ is the normalized axial power distribution from thimble j at core elevation Z.

b. P_L is the fraction of RATED THERMAL POWER.

c. K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

d. $\overline{R}_j$, for thimble j, is determined from at least n=6 incore flux maps covering the full configuration of permissible rod patterns above P_m% of RATED THERMAL POWER in accordance with:

$$\overline{R}_j = \frac{1}{n} \sum_{i=1}^{n} R_{ij}$$

Where:

$$R_{ij} = \frac{F_{Qi}^{Meas}}{[F_{ij}(Z)]_{Max}}$$

and $[F_{ij}(Z)]_{Max}$ is the maximum value of the normalized axial distribution at elevation Z from thimble j in map i which had a measured peaking factor without uncertainties or densification allowance of F_Q^{Meas}.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-4

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNIT NO. 1

DOCKET NO. 50-338

Introduction:

By letter dated June 8, 1982 (Serial No. 327), the Virginia Electric and Power Company (the licensee) requested an amendment to Facility Operating License No. NPF-4 and No. NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2).

The licensee's amendment request would implement Phase I of a Plant Upgrade Program for NA-1&2. Phases I and II of the Upgrade Program consist of implementing a steam pressure increase to maximize the electrical output at the currently licensed thermal power level. Completion of Phases I and II would be followed by implementation of Phase III, a core thermal power uprating program.

The licensee's June 8, 1982 request would implement Phase I by revising the NA-1 Technical Specifications (NA-2 to be revised at a later date) to allow operation with a Reactor Coolant System (RCS) average temperature (T_{av}) of 582.8 degrees Fahrenheit (^{o}F) as opposed to the currently approved RCS T_{av} of 580.3^{o}F. This 2.5^{o}F increase in T_{av} will provide an increase in the secondary side steam pressure of 18 pounds per square inch (psi) resulting in a higher secondary cycle thermal efficiency and a 2 Megawatt electrical (MWe) increase in electrical output.

Discussion:

The licensee has provided safety evaluations in order to provide a technical basis that the proposed increase in the RCS T_{av} does not involve any unreviewed safety question in accordance with 10 CFR Part 50.59. The safety evaluations included the scope of the Nuclear Steam Supply System (NSSS), the Balance of Plant (BOP), and the Turbine-Generator System.

Section 15.1.2.2 of the NA-1&2 Final Safety Analysis Report (FSAR) indicates that the original design bases for the accident analyses included a 2.5^{o}F additional allowance on temperature. The additional

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Certified By Patricia J. Norton

allowance, without invalidating any accident analysis, calls for steady state operation at nominal average temperatures up to 2.5°F greater than the design value of 580.3°F. All accident analyses were performed at either the design RCS T_{av} of 580.3°F plus 6.5°F (586.8°F) or at 580.3°F -4°F, whichever is more conservative.

An uncertainty of plus or minus (±) 4°F is required to envelope temperature and control uncertainties. Therefore, the existing FSAR analysis is adequate for operation at 582.8°F ± 4°F. For transients postulated to initiate at "No Load" conditions, the docketed temperature of 540°F remains unchanged. In summary, the docketed NA-1&2 FSAR accident analyses envelopes NSSS fullpower operations at 2785 Megawatts thermal (MWt) with a RCS T_{av} of 582.8°F.

All the TS data are appropriate for an RCS T_{av} of 582.8°F except for the overtemperature and overpower ΔT setpoints and minor changes incorporating the higher RCS T_{av}. The calculation of the currently licensed overpower and overtemperature ΔT setpoints and associated constants was based on a nominal RCS average temperature of 580.3°F at 2785 MWt. The licensee has performed analyses to determine the overpower and overtemperature ΔT setpoints for an RCS average temperature of 582.8°F. Also, the licensee has performed confirmatory analyses to verify that the revised constants and resulting setpoints are appropriate and provide adequate protection against Departure from Nucleate Boiling (DNB). The new setpoints and associated changes will be incorporated in the utility Precautions, Limitations and Setpoints (PLS) document and plant procedures.

Evaluation:

We have reviewed the NA-1&2 FSAR and the licensee submittal justifying a 2.5°F increase in the RCS T_{av}. From our review we have determined that the increase is within the limits assumed in the docketed FSAR accident and transient analyses and, therefore, is acceptable. Thus, we find full power operation at the currently licensed thermal power level (2785 MWt) with an average RCS temperature of 582.8°F to be acceptable. Also, we have reviewed the TS changes associated with the NA-1&2 Phase I Upgrade Program and we find these changes acceptable.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: October 4, 1982

Principal Contributors:

L. Engle
A. Gill
G. Schwenk

7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-338

VIRGINIA ELECTRIC AND POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 42 to Facility Operating License No. NPF-4 issued to the Virginia Electric and Power Company (the licensee) for operation of the North Anna Power Station, Unit No. 1 (the facility) located in Louisa County, Virginia. The amendment is effective as of its date of issuance.

The amendment revises the NA-1 Technical Specifications by increasing the average reactor coolant system temperature from 580.3°F to 582.8°F. The 2.5°F increase is enveloped within the already approved and docketed FSAR accident and transient analyses for the currently licensed thermal power level of 2785 Megawatts.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since this amendment does not involve a significant hazards consideration.

DESIGNATED ORIGINAL

Certified By Patricia J. Norman

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated June 8, 1982; (2) Amendment No. 42 to Facility Operating License No. NPF-4; and (3) the Commission's related Safety Evaluation. These items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D. C. 20555 and at the Board of Supervisors Office, Louisa County Courthouse, Louisa, Virginia 23093 and at the Alderman Library, Manuscripts Department, University of Virginia, Charlottesville, Virginia 22901. A copy of items (2) and (3) may be obtained upon request to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland this 4th day of October, 1982.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing