September 5, 2002

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: TECHNICAL SPECIFICATION CHANGES TO REVISE CONTAINMENT ANALYSIS (TAC NOS. MB3530 AND MB3531)

Dear Mr. Christian:

The Commission has issued the enclosed Amendment Nos. 232 and 214 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Unit Nos. 1 and 2. The amendments change the Technical Specifications (TS) in response to your letter dated November 29, 2001, as supplemented June 18, 2002.

These amendments revise Improved TS Limiting Condition for Operation (LCO) 3.6.4 and Figure 3.6.4-1 to establish a new operating domain for the containment partial pressure.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Stephen Monarque, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:
1. Amendment No. 232 to NPF-4
2. Amendment No. 214 to NPF-7
3. Safety Evaluation

cc w/encls: See next page

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Senior Vice President - Nuclear
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Glen Allen, Virginia 23060

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Amendment: ML022520069 **TS Pages: ML022560434** **See previous concurrence
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VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 232
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 November 29, 2001, as supplemented June 18, 2002, 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, 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 Appendix A, as revised through Amendment No. 232, 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 its date of issuance and shall be implemented at the end of the Cycle 16/17 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance:

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 214
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 November 29, 2001, as supplemented June 18, 2002, 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, 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-7 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. , 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 its date of issuance and shall be implemented at the end of the Cycle 15/16 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by GEdison for/

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 5, 2002

ATTACHMENT TO

LICENSE AMENDMENT NO. 232 TO FACILITY OPERATING LICENSE NO. NPF-4

LICENSE AMENDMENT NO. 214 TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NOS. 50-338 AND 50-339

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 areas of change.

Remove Pages	Insert Pages
3.6.4-1	3.6.4-1
3.6.4-2	3.6.4-2
B 3.6.4-2	B 3.6.4-2
B 3.6.7-2	B 3.6.7-2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 232 TO FACILITY OPERATING LICENSE NO. NPF-4

AND AMENDMENT NO. 214 TO FACILITY OPERATING LICENSE NO. NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By application dated November 29, 2001, as supplemented by letter dated June 18, 2002, Virginia Electric and Power Company (the licensee) requested changes to the Technical Specifications (TS) for North Anna Power Station, Units 1 and 2. The supplemental letter dated June 18, 2002, provided clarifying information only and did not change the staff's original proposed no significant hazards consideration determination or expand the scope of the application as originally noticed.

The proposed change would revise the acceptable areas of operation for service water temperature and containment air pressure so that limits on containment peak pressure and temperature, emergency core cooling system (ECCS), net positive suction head (NPSH) for the recirculation and low head safety injection pumps, and containment liner structural limits are not exceeded. Improved (ITS) Figure 3.6.4-1 will be changed to establish a new operating domain for containment air partial pressure, ITS Limiting Condition for Operation (LCO) 3.6.4 will be revised to eliminate the containment air partial pressure value of 9.0 psia, and ITS 3.6.7 Bases will be revised to change the recirculation pump delay times.

2.0 REGULATORY EVALUATION

The staff has identified the regulatory requirements. The regulatory requirements for which the staff based its acceptance are listed below.

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.49 requires that for electric equipment important to safety, a record of the environmental qualification be maintained for the entire period that the covered item is installed. The qualification records are needed to permit verification that the item is qualified for its application and meets its specified performance requirements when it is subjected to the conditions predicted to occur when it must perform its safety function up to the end of its qualified life.

In addition, 10 CFR Part 50 Appendix A contains General Design Criteria (GDC) which must be satisfied. Those applicable to the licensee's proposed TS changes are GDC 13, 16, 38, and 50.

GDC 13 requires that instrumentation be provided to monitor variables and systems over their anticipated ranges for normal operation and for accident conditions. The licensee's November 29, 2001, submittal proposed changes to the TS to incorporate the uncertainties in this instrumentation in the containment and NPSH calculations.

GDC 16 requires that containment design conditions important to safety will not be exceeded for as long as postulated accident conditions require. Figure 3.6.4-1 of the ITS, which the licensee is proposing to revise, specifies the range of acceptable initial conditions of partial air pressure versus service water temperature for loss-of-coolant accident (LOCA) and main steam line break (MSLB) calculations and calculations of available NPSH for the containment heat removal and ECCS pumps.

GDC 38 requires that the containment heat removal systems be capable of rapidly reducing the containment pressure and temperature and maintaining them at acceptable levels following a LOCA. The acceptable range of ITS Figure 3.6.4-1 will provide the initial conditions that will ensure the capability of the containment heat removal systems to satisfy this requirement.

GDC 50 requires that the reactor containment structure and associated heat removal systems be designed to accommodate the calculated pressure and temperature conditions resulting from a LOCA. Thus, the calculation models and the input must be conservative.

3.0 TECHNICAL EVALUATION

The staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment that are described in Section 4 of the November 29, 2001, submittal. The detailed evaluation below will support the conclusion that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

North Anna Power Station, Units 1 and 2, both use a subatmospheric type of containment, where the containment atmosphere is maintained at an interior pressure less than atmospheric pressure during normal operation. The design criteria for these containments are:

1. The peak calculated containment pressure, following a design-basis accident, shall not exceed 45 psig,

2. The containment shall be depressurized following a design-basis accident to below one atmosphere absolute pressure in less than 60 minutes, and

3. Once depressurized, the containment shall be maintained at a pressure less than one atmosphere absolute for the duration of the accident.

The peak pressure following a design-basis accident is limited by controlling the initial partial air pressure inside containment, which is specified in ITS Figure 3.6.4-1 as a function of the service water temperature. Depressurization of each containment following a LOCA or an MSLB accident inside containment is also controlled by the limits of these figures and by the quench spray and the recirculation spray systems. The recirculation spray system consists of

an inside recirculation spray and outside recirculation spray systems. The safety-related quench spray system takes suction from the refueling water storage tank (RWST). There is no built-in delay in the start of the quench spray system. The licensee's November 29, 2001, submittal proposed the following changes to the ITS.

Limiting Condition for Operation - ITS 3.6.4

This LCO requires the primary containment air partial pressure to be maintained greater than or equal to 9.0 psia. The licensee proposed to delete the reference to 9.0 psia from the LCO.

As part of this submittal dated November 29, 2001, the licensee proposed to raise the lower limit of the Containment Air Partial Pressure Versus Service Water Temperature, Figure 3.6.4-1, from 9.0 psia to 10.25 psia. As such, the value 9.0 psia will no longer apply as a lower limit to the LCO. The licensee will still be required to comply with LCO 3.6.4 by maintaining pressure within the acceptable region shown on the Containment Air Partial Pressure Versus Service Water Temperature, Figure 3.6.4-1. Since Figure 3.6.4-1 is being revised as part of this license amendment, the value of 9.0 psia is no longer applicable. Accordingly, the staff finds this proposed change to be acceptable.

ITS Figure 3.6.4-1

The licensee proposed to revise the Containment Air Partial Pressure Versus Service Water Temperature, Figure 3.6.4-1, based on new LOCA analyses that incorporates instrument uncertainties in variables that were previously not included. The staff documented its approval of the licensee's current LOCA analysis in a December 14, 1988, letter to the licensee.

The licensee's November 29, 2001, submittal stated that ITS Figure 3.6.4-1 of the North Anna Power Station was calculated using the LOCTIC computer code, which has also been used for various containment calculations. A description of the LOCTIC code is provided in Section 6.2.1.1.1.2 of the North Anna Updated Final Safety Analysis Report. The LOCA mass and energy input for the containment calculations has not been changed from the current analysis.

The licensee's November 29, 2001, submittal stated that there have been no parameter changes that would affect the calculated consequences of the postulated MSLB, and consequently, the postulated MSLB accident was not recalculated. The licensee's MSLB accident analysis was approved by the staff in License Amendment Nos. 110 and 96, dated December 14, 1988.

The licensee used the computer code LOCTIC to determine the maximum partial air pressure, which ensures that the peak containment pressure remains below the maximum pressure limit of 45 psig and that the depressurization time remains below 1 hour and never thereafter rises above atmospheric pressure. The LOCTIC code has been used in previous design-basis calculations approved by the staff, such as License Amendment Nos. 110 and 96, dated December 14, 1988, which approved the current version of ITS Figure 3.6.4-1. The mass and energy input to the containment calculations has not changed. This was calculated using the Westinghouse LOFTRAN code in License Amendment Nos. 110 and 96, dated December 14, 1988.

The upper curve of ITS Figure 3.6.4-1 is the limit of acceptable operation for peak containment pressure and depressurization time. The lower limit of ITS Figure 3.6.4-1 is the limit of acceptable operation to ensure that the available NPSH for the containment spray and ECCS pumps remains greater than the required NPSH during the design-basis accident. The licensee stated that a margin of 0.5 ft is included in the lower limit of ITS Figure 3.6.4-1.

The containment design pressure for the containments is 45 psig. The value of P_a[1] for North Anna is 44.1 psig. The peak calculated pressure remains below this value of P_a; therefore, the containment 10 CFR Part 50 Appendix J leakage rate testing program is not affected by this change to ITS Figure 3.6.4-1. In addition, since the calculated containment peak pressure and temperature, as a result of the revised ITS, are less than those employed in the original design, the staff concludes the proposed changes are acceptable with respect to the containment capability in both units.

The licensee stated in their November 29, 2001, submittal that the temperature and pressure results from the peak pressure and depressurization analyses were compared to the existing environmental zone description equipment qualification limits. The NPSH analyses establish the lower limit for containment pressure and air temperature, so those analysis results are non-limiting for the purposes of equipment qualification. Consequently, the equipment profiles remain bounding and the licensee has complied with the requirements of 10 CFR 50.49.

Since the licensee's proposed ITS Figure 3.6.4-1 was calculated with approved methods, and the curves satisfy the three criteria for subatmospheric containments and NPSH, the staff finds this proposed change acceptable.

ITS B 3.6.7

The licensee proposed to change the surveillance value for the nominal inside recirculation spray pump start delay time from 195 seconds to 400 seconds and reduce the timer uncertainties for this pump from 9.75 seconds to 5.0 seconds. In addition, the licensee is proposing to revise the timer uncertainties for the outside recirculation spray pump start delay timer from 21.0 seconds to 5.0 seconds. The licensee stated these changes are being proposed to reflect improved instrument accuracy, and to continue to provide adequate NPSH margin consistent with the proposed containment air partial pressure operating limits of ITS Figure 3.6.4-1. In addition, the licensee indicated that by delaying the start of the recirculation spray system, the core cooling will be enhanced by maintaining a higher containment backpressure during the reflood portion of the LOCA. A higher backpressure provides a faster reflood and quenching of the reactor core.

The licensee stated in their June 18, 2002, letter that their calculation instrument uncertainty is consistent with the methodology in ANSI/ISA-S67.04-Part 1-1982, "Setpoints for Nuclear Safety Related Instrumentation," which the NRC endorsed by Regulatory Guide 1.105, Rev. 2, "Instrument Setpoints for Safety-related Systems." The licensee further stated that resistance temperature devices (RTDs) for RWST Temperature, Containment Air Temperature,

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[1] P_a is defined in 10 CFR Part 50 Appendix J as the calculated peak containment internal pressure related to the design-basis LOCA. It is the pressure used for containment leakage rate testing.

Containment Air Partial Pressure, Service Water Temperature, and Maximum Casing Cooling Temperature will be replaced or calibrated frequently to limit the RTD drift and create a smaller instrument measurement uncertainty to ensure that instrument uncertainties continue to be consistent with the allowances assumed in the revised accident analysis. The RTD replacement program is controlled through plant design change procedures and maintenance programs. Based on the information provided, the staff finds the proposed changes acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 21295). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: September 5, 2002

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North Anna Power Station
Units 1 and 2

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