October 24, 2005

Mr. David A. Christian
Senior 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 ON REVISED TEST FREQUENCY OF P-4 INTERLOCK FUNCTION (TAC NOS. MC6301 AND MC6302)

Dear Mr. Christian:

The Commission has issued the enclosed Amendment Nos. 244 and 225 to Renewed Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units 1 and 2, respectively. The amendments change the Technical Specifications in response to your letter dated March 1, 2005, as supplemented by letters dated June 16 and September 23, 2005.

These amendments revise the frequency for the trip actuating device operational test of the P-4 interlock function for North Anna, Units 1 and 2.

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 R. 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. 244 to NPF-4
2. Amendment No. 225 to NPF-7
3. Safety Evaluation

cc w/encls: See next page

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VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 244
Renewed 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 March 1, 2005, as supplemented by letters dated June 16 and September 23, 2005, 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 Renewed 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. 244, 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 within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Evangelos C. Marinos, 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: October 24, 2005

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 225
Renewed 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 March 1, 2005, as supplemented by letters dated June 16 and September 23, 2005, 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 Renewed 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. 225, 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 within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Evangelos C. Marinos, 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: October 24, 2005

ATTACHMENT TO

LICENSE AMENDMENT NO. 244 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-4

AND

LICENSE AMENDMENT NO. 225 TO

RENEWED 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
3.3.2-6	3.3.2-6
3.3.2-7	3.3.2-7
3.3.2-11	3.3.2-11

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 244 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-4

AND AMENDMENT NO. 225 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated March 1, 2005, as supplemented by letters dated June 16 and September 23, 2005, Virginia Electric and Power Company (the licensee) submitted a license amendment request (LAR) for North Anna, Units 1 and 2 to revise Technical Specification (TS) 3.3.2 to change the frequency for the trip actuating device operational test (TADOT) of the P-4 interlock function. The proposed changes would revise the surveillance requirement (SR) frequency for the TADOT from "Once per reactor trip breaker cycle" to "18 months," which is consistent with the original North Anna, Units 1 and 2 TS P-4 interlock surveillance frequency.

The engineered safety feature actuation system (ESFAS) actuates necessary safety systems, based on the measurement of selected parameters, to protect against violating core design limits and the reactor coolant system (RCS) pressure boundary and to mitigate accidents. To allow some flexibility in reactor plant operations, the ESFAS has several interlocks. These interlocks permit the operator to block some signals, automatically enable other signals, prevent some actions from occurring, and cause other actions to occur. The functions interlocked with P-4 avert or reduce the continued cooldown of the RCS following a reactor trip. None of the noted functions serves as primary mitigation function in the unit licensing basis safety analyses. The functions of the P-4 interlock are as follows:

- Trip the main turbine
- Isolate main feedwater water (MFW) with coincident low T_{avg}
- Prevent reactuation of safety injection (SI) after a manual reset of SI
- Reset the high steam flow setpoint to the no-load value
- Prevent opening of the MFW regulating valves if they were closed on "SI signal" or "steam generator (SG) water level - high high signal"

2.0 REGULATORY EVALUATION

The Nuclear Regulatory Commission (NRC) staff has identified the applicable regulatory requirements that the NRC staff considered in its review of the application. These requirements are listed below.

- Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, General Design Criteria (GDC) -13 requires that instrumentation be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

- Appendix A to 10 CFR Part 50, GDC-20 requires that the protection system be designed (1) to automatically initiate the operation of appropriate systems, including the reactivity control systems, to ensure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and initiate the operation of systems and components important to safety.

- Appendix A to 10 CFR Part 50, GDC-21 requires that the protection system be designed and tested for high functional reliability.

- Appendix A to 10 CFR Part 50, GDC-22 through GDC-25 and GDC-29 require various design attributes for the protection systems, including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

- 10 CFR Section 50.55a(h), “Protection Systems,” requires that the protection systems meet IEEE 279-1971, “Criteria for Protection Systems for Nuclear Power Generating Stations.” Sections 4.9 - 4.11 of IEEE 279-1971 discusses testing of protection systems.

- 10 CFR Section 50.36(c)(3), “Surveillance requirements,” states that surveillance requirements are requirements relating to test, calibration, or inspection to assure all necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Surveillance requirements for the P-4 interlock function specify a TADOT. A TADOT shall consist of operating the trip actuating device and verifying the operability of all devices in the channel. The TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. The TADOT may be performed by means of any series of sequential, overlapping, or total channel steps.

The NRC staff also considered the following guidance:

- Regulatory Guide 1.22, “Periodic Testing of Protection Systems Actuation Functions,” discusses an acceptable method of satisfying Appendix A to 10 CFR Part 50, GDC-20 and GDC-21 with respect to the periodic testing of protection system actuation functions.

The NRC staff reviewed the proposed changes to ensure that they meet these regulatory bases and guidance.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Evaluation

The licensee stated that during the conversion to the Improved Technical Specifications (ITS) for North Anna, Units 1 and 2, the TADOT surveillance frequency for the P-4 interlock of "once per reactor trip breaker cycle" specified in NUREG-1431, Rev. 1, "Westinghouse Plants Standard Technical Specifications," was adopted in lieu of retaining the original surveillance frequency of "18 months." The licensee failed to submit a justification for deviation at the time of the TS conversion to retain the original TS requirement of the P-4 TADOT surveillance frequency of 18 months. Some plants retained the 18-months interval for performing the TADOT of the P-4 interlock function. These plants include Wolf Creek Generating Station, Byron Station, Braidwood Station, Comanche Peak Steam Electric Station, and Donald C. Cook Nuclear Plant. The proposed changes in this LAR are consistent with the practices at these plants.

3.2 Proposed TS Changes

The following proposed changes will revise SR 3.3.2.10 frequency to perform a TADOT from "once per reactor trip breaker cycle" to "18 months" and add that requirement to SR 3.3.2.7.

- TS SR 3.3.2.7

  Add "or interlock" after the word initiation in the note for SR 3.3.2.7. The note will read "Verification of setpoint not required for manual initiation or interlock functions."

- TS SR 3.3.2.10

  Delete SR 3.3.2.10.

- Table 3.3.2-1, Engineered Safety Feature Actuation System Instrumentation Function 8.a - Reactor Trip, P-4

  Change SR 3.3.2.10 to SR 3.3.2.7 in the "Surveillance Requirements" column.

- The ESFAS instrumentation bases will also be revised to reflect the above TS changes.

3.3 NRC Staff Evaluation of the Proposed TS Change

The P-4 interlock uses the status of the reactor trip breakers (RTBs) input to the ESFAS. The P-4 interlock function consists of two trains of cell switches and auxiliary contacts which sense reactor trip and bypass breaker position and the corresponding logic circuits in each solid-state protection system train. The P-4 interlock is enabled when a RTB and the associated bypass breaker are opened. Once the P-4 interlock is enabled, automatic safety injection initiation is blocked after a time delay. This function allows operators to take manual control of SI systems after the initial phase of injection is complete. Once SI is blocked, automatic actuation of SI

cannot occur until the RTBs have been manually closed, resetting the P-4 interlock. To be consistent with the hardware and the other ESFAS functions, NUREG-1431, Table 3.3.2-1, “Engineered Safety Feature Actuation System Instrumentation,” item 8.a, listed P-4 as a functional item with columns for applicable modes, required channels, conditions, SRs and the allowable value.

NUREG-1431 requires that the P-4 interlock function perform TADOT once per RTB cycle. However, some P-4 safety functions (e.g., turbine trip and reset high steam flow setpoint) can only be tested when the plant is shut down. The P-4 function prevents opening of the MFW isolation valves if they were closed on SI or SG water level high-high.

The licensee stated that current TADOT testing is performed by two electricians and is coordinated by operations personnel. The voltage across the contacts is measured while the RTBs and bypass breakers are opened and then checked again when the RTBs are closed. The performance of the TADOT for each P-4 interlock train is considered to be the combined completion of the “before breaker closure” contact check and the “after breaker closure” contact check. These contacts are part of the input circuit to the solid-state protection system for the feedwater isolation function. The remaining P-4 circuits, which include the main control room annunciator for reactor trip turbine trip, the turbine trip on reactor trip function, and the P-4 input to reset the Hi steam flow setpoint, are checked by other station procedures at least once per refueling interval. TADOT testing of the reactor trip and bypass breakers is also performed during reactor protection and engineered safety features actuation logic testing per SR 3.3.1.4 on a 31-day staggered test basis. This surveillance tests the logic functions of the solid-state protection system, as well as the reactor trip and bypass breakers. The breakers are tested to ensure that the breakers will open on a trip signal.

The licensee further stated that since the implementation of the ITS at North Anna, Units 1 and 2, the TADOT testing is required every time the RTB is cycled. This occurs at least 8 times and as many as 18 times during a refueling outage within a 1 to 2 day period and requires approximately 20 to 30 minutes with at least a three-man team, plus additional pre-job brief time and preparation time for each test. The tests are performed during critical path time during the plant restart from the outage and are an unnecessary and unintended burden.

Since the initial testing of the P-4 interlock functions, there have been no identified failures of the P-4 interlock. This includes previous testing at the 18-month frequency and currently at the frequency of once per RTB cycle. Most of the additional P-4 interlock testing is done over a few days during plant startup from a refueling outage before the reactor becomes critical. The licensee concluded that doing multiple tests over a short period does not provide additional reliability data.

The only function of the RTB position switches that provide input to the P-4 interlock is to open or close the contacts. This function has no adjustable trip setpoints for an allowable value. The P-4 interlock is generated by an auxiliary contact in the RTB and, therefore, is not subject to instrument drift.

Based on the review of the licensee's submittals dated March 1, June 16, and September 23, 2005, the NRC staff reaches the following conclusions:

- North Anna's original TS TADOT frequency of P-4 interlock was every 18 months, which is consistent with the practice at other operating plants (Wolf Creek Generating Station, Byron Station, Braidwood Station, Comanche Peak Steam Electric Station, and Donald C. Cook Nuclear Plant) that retained the 18 month surveillance frequency.

- The ESFAS logic circuitry, the RTB, and the bypass breaker are being tested by more frequently performed test procedures. Extending the TADOT of P-4 interlock surveillance interval is acceptable because the primary protective components are verified by the more frequent testing of trip breakers.

- Doing the TADOT for P-4 interlock function once per RTB cycle is an unnecessary and unintended burden on the licensee.

- Reducing the testing frequency to "once every 18 months" does not adversely impact safety and does not require any changes to the ESFAS instrumentation design requirements.

Therefore, based on the above conclusions, the NRC staff finds the proposed TS 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 amendment. The state official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

These 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 and/or changes surveillance requirements. The NRC 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 (70 FR 21465). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Hulbert Li

Date: October 24, 2005

North Anna Power Station, Units 1 & 2

cc:

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