UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 27, 2014

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING MODIFICATION OF CONTROL BANK SEQUENCE AND OVERLAP TECHNICAL SPECIFICATION (TAC NOS. MF0919 AND MF0920)

Dear Mr. Heacock:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 272 and 254 to Renewed Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station (NAPS), Unit Nos. 1 and 2, respectively. The amendments change the Technical Specifications (TSs) in response to your application dated February 22, 2013.

These amendments revise Technical Specification 3.1.6, "Control Bank Insertion Limits," to include text, into Condition A. stating, "for reasons other than Condition C". TS change would point to Condition C, which, if applicable, would allow the specified completion time to restore the control bank to within the insertion limit to be increased from 2 hours to 72 hours.

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,

Dr. V. Sreenivas, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:
1. Amendment No. 272 to NPF-4
2. Amendment No. 254 to NPF-7
3. Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 272
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 (the licensee) dated February 22, 2013, 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 hereby 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. 272 are hereby incorporated in the renewed 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 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert J Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-4
and the Technical Specifications

Date of Issuance: August 27, 2014

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 254
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 (the licensee) dated February 22, 2013, 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

   C. 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 hereby 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. 254 are hereby incorporated in the renewed 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 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert J Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-7
and the Technical Specifications

Date of Issuance: August 27, 2014

ATTACHMENT TO

LICENSE AMENDMENT NO. 272

RENEWED FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

AND

TO LICENSE AMENDMENT NO. 254

RENEWED FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Renewed Facility Operating Licenses and the Appendix "A" Technical Specifications (TSs) with the enclosed pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
Licenses	Licenses
License No. NPF-4, page 3	License No. NPF-4, page 3
License No. NPF-7, page 3	License No. NPF-7, page 3
TSs	TSs
3.1.6-1	3.1.6-1

(2) Pursuant to the Act and 10 CFR Part 70, VEPCO to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Updated Final Safety Analysis Report;

(3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, VEPCO to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, VEPCO to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material, without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or component; and

(5) Pursuant to the Act and 10 CFR Parts 30 and 70, VEPCO to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

VEPCO is authorized to operate the North Anna Power Station, Unit No. 1, at reactor core power levels not in excess of 2940 megawatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 272 are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications. |

(3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, VEPCO to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, VEPCO to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material, without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, VEPCO to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations as set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

VEPCO is authorized to operate the facility at steady state reactor core power levels not in excess of 2940 megawatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 254 are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications. |

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following the issuance of the condition or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the renewed license supported by a favorable evaluation by the Commission:

a. If VEPCO plans to remove or to make significant changes in the normal operation of equipment that controls the amount of radioactivity in effluents from the North Anna Power Station, the

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 Control Bank Insertion Limits

LCO 3.1.6 Control banks shall be within the insertion, sequence, and overlap limits specified in the COLR.

APPLICABILITY: MODE 1,
MODE 2 with $k_{eff} \geq 1.0$.

- - - - - - - - - - - - - - - - NOTE - - - - - - - - - - - - - - - -
This LCO is not applicable while performing SR 3.1.4.2.
- -

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control bank sequence or overlap limits not met for reasons other than Condition C.	A.1.1 Verify SDM to be within the limits provided in the COLR. OR A.1.2 Initiate boration to restore SDM to within limit. AND A.2 Restore control bank sequence and overlap to within limits.	1 hour 1 hour 2 hours
B. Control bank insertion limits not met for reasons other than Condition C.	B.1.1 Verify SDM to be within the limits provided in the COLR. OR B.1.2 Initiate boration to restore SDM to within limit. AND	1 hour 1 hour (continued)

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 272 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-4

AND

AMENDMENT NO. 254 TO RENEWED 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 letter dated February 22, 2013[i], the Virginia Electric and Power Company (the licensee) requested a change to the Technical Specifications (TSs) to Facility Operating License Nos. NPF-4 and NPF-7 for North Anna Power Station, Units 1 and 2 (NAPS1 and NAPS2), respectively. Specifically the licensee requested a change to TS 3.1.6, which specifies the control rod insertion, sequence, and overlap limits.

The proposed TS change will insert text, into Condition A, stating, "for reasons other than Condition C". This text will modify Condition A, for control bank sequence or overlap limits to be consistent with the description of Condition B for control bank insertion limits. The proposed TS change would point to Condition C, which, if applicable, would allow the specified completion time to restore the control bank to within the insertion limit, to be increased from 2 hours to 72 hours.

Condition C is entered when:

> control bank A, B, or C is inserted not more than 18 steps below the insertion limit and the bank is immovable, and
>
> each control and shutdown rod remains within the limits of LCO 3.1.4, and
>
> each shutdown bank remains within the insertion limits of LCO 3.1.5.

The actions that are specified for Condition C are:

C.1 Verify that shutdown margin remains within the limits provided in the COLR (once per 12 hours), and

C.2 Restore the control bank to within the insertion limit (72 hours).

The proposed TS change would allow continued operation, for 72 hours, when the sequence and overlap limits are not met. This would be consistent with the current, specified completion time, of 72 hours, when control bank insertion limits are not met. The TS completion time, specified in Condition C, allows up to 72 hours for finding and correcting an urgent failure condition. An urgent failure alarm stops automatic and overlapped rod motion; and could result in an immovable, but trippable group or bank that is inserted up to 18 steps below the insertion limits.

An urgent failure condition could occur during periodic testing of the control and shutdown rods, during power operation, which is required in order to verify that the rods can be tripped. Rods that are not fully inserted into the core are moved by at least 10 steps, in and out, at least once each quarter. The current test procedure calls for the rods to be moved by 18 steps in each direction. An urgent failure alarm can be triggered when there is a failure in the rod control equipment that impedes the system's ability to move rods.

2.0 REGULATORY EVALUATION

The NRC staff evaluated the proposed TS changes with respect to the requirements specified in certain of the General Design Criteria (GDC) for nuclear power plants listed in 10 CFR 50 Appendix A. These are:

GDC-10, *Reactor Design*
GDC-10 requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to that specified acceptable fuel design limits (SAFDLs) are not exceeded during any condition of normal operation assure including the effects of anticipated operational occurrences (AOOs).

GDC-26, *Reactivity Control System Redundancy and Capability*
GDC-26 requires that two independent reactivity control systems of different design principles shall be provided. One of the systems shall use control rods, preferably including a positive means for inserting the rods, and shall be capable of reliably controlling reactivity changes to assure that under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified acceptable fuel design limits are not exceeded. The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded. One of the systems shall be capable of holding the reactor core subcritical under cold conditions.

GDC-28, *Reactivity Limits*
GDC-28 requires that the reactivity control systems be designed to assure that the effects of postulated reactivity accidents can neither result in damage to the reactor coolant pressure boundary (RCPB) greater than limited local yielding, nor sufficiently disturb the core, its support structures or other reactor pressure vessel internals to impair significantly the capability to cool the core.

In 10 CFR 50.36, "Technical Specifications," the NRC established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36, TS are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls.

The proposed change revises the North Anna Unit 1 and 2 Technical Specification limiting conditions for operation (LCO) 3.1.6, which specifies the control rod insertion, sequence, and overlap limits.

With the implementation of specific changes to the LCO Conditions and Surveillance requirements, the intent of the 10 CFR 50.36 regulatory requirements will continue be met.

3.0 TECHNICAL EVALUATION

The proposed TS change will insert text, into Condition A, stating, "for reasons other than Condition C". This text would make Condition A, for control bank sequence or overlap limits, consistent with the description of Condition B, for control bank insertion limits. The proposed TS change would point to Condition C, which, if applicable, would allow the specified completion time to restore the control bank to within the insertion limit to be increased from 2 hours to 72 hours. The modified TSs, therefore, would allow an increase in completion time from 2 hours to 72 hours to restore the control bank to within the insertion limit, whenever the specifications of Condition C are present.

Exceeding the rod sequence and overlap limits, due to a rod urgent failure (RUF), (i.e., due to the presence of an immovable; but trippable rod), with one control bank inserted up to 18 steps below its insertion limit, for up to 72 hours, would not produce core radial peaking factors that could lead to exceeding the applicable DNB ratio limits that are needed to meet the SAFDLs during AOOs. Therefore, the requirements of GDC-10 are met.

If an RUF occurs (i.e., a control bank is inserted up to 18 steps below its insertion limit) for up to 72 hours, then the shutdown margin will not be reduced to less than shutdown margin that is assumed in the NAPS accident analyses. The RUF would not affect the second reactivity control system (the chemical volume and control system), which would continue to control the concentration of boron in the reactor coolant (and moderator). Therefore, the requirements of GDC-26 are met.

The most severe misalignments would occur when one RCCA is fully inserted, or when bank D is fully inserted with one RCCA fully withdrawn. These situations do not lead to damage in the RCPB, and do not impair the capability to cool the core. Therefore, the requirements of GDC-28 are met.

The effect of the proposed TS change would be to direct that TS 3.1.6.C Action be entered if an RUF occurs during the performance of Surveillance Requirement (SR) 3.1.4.2, which verifies control rod freedom of movement. This would allow the sequence and overlap limits to be exceeded, for up to 72 hours, when in Condition C.

Each control and shutdown control rod assembly bank is regularly tested during power operation to ensure that it is trippable. The test procedure involves sequential insertion and withdrawal, by 18 steps, for each bank. The rods may be inserted beyond their insertion limits for the purpose of conducting this test.

An RUF alarm, which can be triggered during the performance of control rod freedom of movement testing, indicates that there is a failure in the rod control equipment that impedes its ability to move control rod assemblies. An RUF does not affect a control rod assembly's trippability. The proposed change adds text "for reasons other than Condition C" to Condition A, which points to Condition C. This allows up to 72 hours for troubleshooting and restoration if the control bank insertion is not more than 18 steps below the insertion limit, and the insertion limits of LCO 3.1.4 and 3.1.5 are met. The longer completion time can be allowed, since the control rod's trippability (and the analysis value for the minimum available shutdown margin) is maintained.

The proposed TS modifies the current TS Condition A only insofar as it directs that Condition C (72-hour completion time) can apply instead of 2 hours. Condition C. itself is not modified. The elements of Condition C (including the 72-hour completion time) were included, by the NRC staff, in the NAPS1 and NAPS2 TSs via License Amendments 179 and 160, respectively, on March 1, 1994[ii].

The NRC staff finds the proposed TS change, to Condition A, be acceptable, since (1) it is consistent with the description of current Condition B and proposed TS change would point to Condition C, and (2) it does not affect the control rod's trippability, or the analysis value for the minimum available shutdown margin. The NRC staff will insert text, into TS Condition A, stating, "for reasons other than Condition C". This would make Condition A, for control bank sequence or overlap limits, consistent with Condition B, for control bank insertion limits.

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 requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 (78 FR 25317). 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.

4.0 CONCLUSION

The NRC 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) there is reasonable assurance that 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: S. Miranda

Date: August 27, 2014

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[i] Virginia Electric Power Company, North Anna Power Station, Units 1 and 2, Proposed License Amendment Request (LAR), Control Bank Sequence and Overlap Limit Action, February 22, 2013, ADAMS Accession No. ML13064A352

[ii] North Anna Units 1 and 2 – Issuance of Amendments Re: Control Rod Urgent Failure Condition, March 1, 1994

August 27, 2014

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING MODIFICATION OF CONTROL BANK SEQUENCE AND OVERLAP TECHNICAL SPECIFICATION (TAC NOS. MF0919 AND MF0920)

Dear Mr. Heacock:

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Sincerely,
/RA/
Dr. V. Sreenivas, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:
1. Amendment No. 272 to NPF-4
2. Amendment No. 254 to NPF-7
3. Safety Evaluation

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NAME	VSreenivas	SFigueroa	CJackson	CKanatas	RPascarelli	VSreenivas
DATE	07/08/14	07/08/14	06/24/14	08/21/14	08/27/14	08/27/14

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