



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

January 17, 2020

Mr. Daniel G. Stoddard
Senior Vice President and Chief Nuclear Officer
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF
AMENDMENT NOS. 285 AND 268 TO REVISE TECHNICAL SPECIFICATIONS
REGARDING EMERGENCY DIESEL GENERATOR MAXIMUM VOLTAGE
LIMITS (EPID L-2019-LLA-0067)

Dear Mr. Stoddard:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 285 and 268 to Renewed Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station (North Anna), Unit Nos. 1 and 2, respectively. These amendments were issued in response to your application dated March 18, 2019.

The amendments revise North Anna Technical Specifications to reduce the maximum voltage specified for certain Section 3.8.1 Surveillance Requirements associated with the Emergency Diesel Generators.

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

Sincerely,

A handwritten signature in black ink, appearing to read "G. Edward Miller", is written over the word "Sincerely,".

G. Edward Miller, Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:

1. Amendment No. 285 to NPF-4
2. Amendment No. 268 to NPF-7
3. Safety Evaluation

cc: Listserv



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. 285
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 March 18, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 page 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. 285, 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 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Operation

Attachment:
Changes to Renewed Facility
Operating License No. NPF-4
and Technical Specifications

Date of Issuance: January 17, 2020



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. 268
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 March 18, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 page 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. 268, 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 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Operation

Attachment:
Changes to Renewed Facility
Operating License No. NPF-7
and Technical Specifications

Date of Issuance: January 17, 2020

ATTACHMENT TO
NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2
LICENSE AMENDMENT NO. 285
RENEWED FACILITY OPERATING LICENSE NO. NPF-4
DOCKET NO. 50-338
AND LICENSE AMENDMENT NO. 268
RENEWED FACILITY OPERATING LICENSE NO. NPF-7
DOCKET NO. 50-339

Replace the following pages of the Renewed Facility Operating Licenses with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

NPF-4, page 3
NPF-7, page 3

Insert

NPF-4, page 3
NPF-7, page 3

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

3.8.1-8
3.8.1-10
3.8.1-11
3.8.1-12
3.8.1-13
3.8.1-16
3.8.1-18
3.8.1-19

Insert

3.8.1-8
3.8.1-10
3.8.1-11
3.8.1-12
3.8.1-13
3.8.1-16
3.8.1-18
3.8.1-19

- (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

Technical Specifications contained in Appendix A, as revised through Amendment No. 285 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 component; 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. 268 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 insurance 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	<p>-----NOTES-----</p> <p>1. All EDG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</p> <p>2. A modified EDG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</p> <p>-----</p> <p>Verify each required EDG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.</p>	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.7 -----NOTE----- All EDG starts may be preceded by an engine prelube period. -----</p> <p>Verify each required EDG starts from standby condition and achieves</p> <p>a. In ≤ 10 seconds, voltage ≥ 3960 V and frequency ≥ 59.5 Hz; and</p> <p>b. Steady state voltage ≥ 3740 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.8 -----NOTE----- This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. -----</p> <p>Verify manual transfer of AC power sources from the normal offsite circuit to the alternate required offsite circuit.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTE----- If performed with EDG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable. ----- Verify each required EDG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> Following load rejection, the frequency is ≤ 66 Hz; Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ 4400V; and Within 3 seconds following load rejection, the frequency is ≥ 59.5 Hz and ≤ 60.5 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.10 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All EDG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; c. Each required EDG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through sequencing timing relays, 3. maintains steady state voltage ≥ 3740 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 59.5 Hz and ≤ 60.5 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All EDG starts may be preceded by prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. <p>-----</p> <p>Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each LCO 3.8.1.b EDG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. In ≤ 10 seconds after auto-start and during tests, achieves voltage ≥ 3960 V and frequency ≥ 59.5 Hz; b. Achieves steady state voltage ≥ 3740 V and ≤ 4400 V and frequency ≥ 59.5 Hz and ≤ 60.5 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized or auto-connected through the sequencing timing relays from the offsite power system. 	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTES-----</p> <ol style="list-style-type: none"> 1. This Surveillance shall be performed within 5 minutes of shutting down the EDG after the EDG has operated ≥ 2 hours loaded ≥ 2500 kW and ≤ 2600 kW or after operating temperatures have stabilized. <p> Momentary transients outside of load range do not invalidate this test.</p> <ol style="list-style-type: none"> 2. All EDG starts may be preceded by an engine prelube period. <p>-----</p> <p>Verify each required EDG starts and achieves</p> <ol style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3960 V and frequency ≥ 59.5 Hz; and b. Steady state voltage ≥ 3740 V, and ≤ 4400 V and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.15 -----NOTE-----</p> <p>This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced.</p> <p>-----</p> <p>Verify each required EDG:</p> <ol style="list-style-type: none"> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation. 	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.17 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All EDG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the unit is maintained or enhanced. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. Each LCO 3.8.1.b EDG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencing timing relays, 3. achieves steady state voltage ≥ 3740 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 59.5 Hz and ≤ 60.5 Hz, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes. 	<p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.18 -----NOTE----- All EDG starts may be preceded by an engine prelube period. ----- Verify when started simultaneously from standby condition, each LCO 3.8.1.b EDG achieves:</p> <ul style="list-style-type: none"> a. in ≤ 10 seconds, voltage ≥ 3960 V and frequency ≥ 59.5 Hz; and b. steady state voltage ≥ 3740 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. 	<p>In accordance with the Surveillance Frequency Control Program</p>



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 285 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-4

AND

AMENDMENT NO. 268 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 March 18, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19086A113), Virginia Electric and Power Company (Dominion, the licensee) requested an amendment to Renewed Facility Operating License Nos. NPF-4 and NPF-7 for North Anna Power Station (North Anna, NAPS), Units 1 and 2. The proposed amendment would revise Technical Specification (TS) 3.8.1, "AC [Alternating Current] Sources – Operating," with regard to the surveillance requirements (SRs) for the emergency diesel generators (EDGs). Specifically, the proposed changes would modify the maximum steady state voltage for the EDGs from 4580 Volts (V) to 4400 V in SRs 3.8.1.2, 3.8.1.7, 3.8.1.9, 3.8.1.10, 3.8.1.11, 3.8.1.14, 3.8.1.17, and 3.8.1.18. The EDG minimum steady state voltage and the EDG steady state frequency range would remain unchanged.

2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff applied the following NRC and design basis requirements to evaluate the license amendment request (LAR).

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications," requires, in part, that the operating license of a nuclear power facility include TSs. The 10 CFR 56.36(c)(3) requires that the TSs include SRs, which are requirements "relating to test, calibration, or inspection to assure that the 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."

The LAR proposes to change the maximum steady state EDG voltage which is a test criterion for eight different SRs in the North Anna TSs.

Section 3.1.13, "Electric Power Systems, Criterion 17," of the North Anna Updated Final Safety Analysis Report (UFSAR) describes North Anna's conformance with Atomic Energy Commission (AEC) Criterion 17 (which corresponds to 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 17). It states, in part:

An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and a capability to ensure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences, and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies, including the batteries and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite ac [alternating current] power supplies and the other offsite electric power circuits, to ensure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a LOCA [loss-of-coolant accident] to ensure that core cooling, containment integrity, and other vital safety functions are maintained.

Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.

Section 3.1.14, "Inspection and Testing of Electric Power Systems, Criterion 18," of the North Anna UFSAR describes North Anna's conformance with AEC Criterion 18 (which corresponds to GDC 18). It states, in part:

Electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of power among the nuclear power unit, the offsite power system, and the onsite power system.

Additionally, the NRC staff considered the following guidance documents in evaluating the LAR:

Regulatory Guide (RG) 1.9, Revision 0 (Safety Guide 9), "Selection of Diesel Generator Set Capacity for Standby Power Supplies" (ADAMS Accession No. ML12305A251).

NRC Final Safety Evaluation of Topical Report WCAP-17308-NP-A, Revision 0, "Treatment of Diesel Generator (DG) Technical Specification Frequency and Voltage Tolerances," July 2017 (ADAMS Accession No. ML17215A232).

3.0 TECHNICAL EVALUATION

3.1 System Description

In its letter dated March 18, 2019, the licensee stated:

Each North Anna unit has two (2) independent 4160-volt emergency buses. Each bus provides power to 4000-volt motors and 4160/480-volt transformers which supply lower voltage equipment including 460-volt motors. Buses 1H and 1J are associated with Unit 1 and Buses 2H and 2J are associated with Unit 2. Each bus is designed to independently supply all safety-related equipment and auxiliaries necessary for safe shutdown of the reactor and all safety-related equipment necessary to mitigate the consequences of an accident.

Each unit has two 100% capacity emergency diesel generators (EDGs) that provide standby emergency AC power with adequate capacity to supply the safety-related equipment. During periods of interrupted preferred power, the EDGs automatically supply AC power to safety-related equipment.

The EDGs will automatically start if a safety injection signal is received, a 90% degraded voltage level is sensed for 56 seconds on the bus, or if approximately 74% voltage exists on the bus for 2 seconds. Following a safety injection signal, the EDG will load if a 90% degraded voltage level exists for 7.5 seconds. When approximately 74% voltage is sensed for 2 seconds, or if a degraded voltage condition exists, the emergency bus is isolated and load shedding begins. The EDG output breaker automatically closes onto the bus when an EDG output voltage reaches 95% of nominal, either of the normal offsite power supply breakers are open, limited residual voltage remains on the bus, and the EDG differential auxiliary relay is reset. An additional permissive exists for the EDGs output breakers requiring either of the bus-tie breakers to be open.

The EDGs are periodically load tested in accordance with North Anna TS SRs.

3.2 Proposed TS Changes

In the LAR, the licensee proposed to revise the following North Anna TS SRs (proposed changes are in **bold**):

TS SR 3.8.1.2

From

Verify each required EDG starts from standby conditions and achieves steady state voltage ≥ 3740 V and \leq **4580** V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

To

Verify each required EDG starts from standby conditions and achieves steady state voltage ≥ 3740 V and \leq **4400** V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

TS SR 3.8.1.7

From

Verify each required EDG starts from standby conditions and achieves...

- b. Steady state voltage ≥ 3740 V and \leq **4580** V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

To

Verify each required EDG starts from standby conditions and achieves...

- b. Steady state voltage ≥ 3740 V and \leq **4400** V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

TS SR 3.8.1.9

From

Verify each required EDG rejects a load greater than or equal to its associated single largest post-accident load, and...

- b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and \leq **4580** V; and

To

Verify each required EDG rejects a load greater than or equal to its associated single largest post-accident load, and...

- b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and \leq **4400** V; and

TS SR 3.8.1.10

From

Verify on an actual or simulated loss of offsite power signal...

- c. Each required EDG auto-starts from standby condition and...
 - 3. maintains steady state voltage ≥ 3740 V and \leq **4580** V,

To

Verify on an actual or simulated loss of offsite power signal...

- c. Each required EDG auto-starts from standby condition and...
 - 3. maintains steady state voltage ≥ 3740 V and \leq **4400** V,

TS SR 3.8.1.11

From

Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each LCO [Limiting Condition for Operation] 3.8.1.b EDG auto-starts from standby condition and...

- b. Achieves steady state voltage ≥ 3740 V and ≤ 4580 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz;

To

Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each LCO 3.8.1.b EDG auto-starts from standby condition and...

- b. Achieves steady state voltage ≥ 3740 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz;

TS SR 3.8.1.14

From

Verify each required EDG starts and achieves...

- b. Steady state voltage ≥ 3740 V, and ≤ 4580 V and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

To

Verify each required EDG starts and achieves...

- b. Steady state voltage ≥ 3740 V, and ≤ 4400 V and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

TS SR 3.8.1.17

From

Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal...

- c. Each LCO 3.8.1.b EDG auto-starts from standby condition and...
 - 3. achieves steady state voltage ≥ 3740 V and ≤ 4580 V,

To

Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal...

- c. Each LCO 3.8.1.b EDG auto-starts from standby condition and...
 - 3. achieves steady state voltage ≥ 3740 V and ≤ 4400 V,

TS SR 3.8.1.18

From

Verify when started simultaneously from standby condition, each LCO 3.8.1.b EDG achieves...

- b. steady state voltage ≥ 3740 V and ≤ 4580 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

To

Verify when started simultaneously from standby condition, each LCO 3.8.1.b EDG achieves...

- b. steady state voltage ≥ 3740 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz.

3.3 NRC Staff Evaluation

As described in its letter dated March 18, 2019, the licensee stated that, in WCAP-17308-NP-A, the wording of the EDG TS SRs allows steady state EDG operation within the voltage and frequency limits specified. The NRC staff has identified an apparent discrepancy during several Component Design Basis Inspections between the EDG TS SRs limits and the application of these limits by many licensees. The steady state EDG voltage and frequency values may impact emergency core cooling system flow calculations, EDG loading calculations, and EDG fuel consumption calculations.

In its LAR, the licensee stated that calculations for NAPS currently include the TS SRs full frequency range and minimum allowable voltage; however, the TS SRs maximum allowable voltage exceeds the existing mechanical and electrical systems analysis. For steady state conditions, the TS SRs maximum allowable voltage (4580 V) also exceeds the EDG 4000-volt motor rating of ± 10 percent (3600 V to 4400 V) for continuous operation. System voltage drops at the 4160V level are not sufficient to limit the motor terminal voltage to 4400 V. In addition, the 4400 V limit is necessary to maintain maximum 480V system voltage limits.

The licensee stated, in Section 3.0 of the LAR, that the NAPS emergency core cooling system flow calculation uses 4400 V as the maximum voltage in its calculation. The licensee also stated that pump slip at 110 percent of rated voltage (4400 V) is less than the slip at the rated 4000 V. Less slip is conservative for flow. Therefore, the NRC staff finds that the proposed changes bring the TS SRs into agreement with the flow calculation and do not impact safety regarding Emergency Core Cooling System (ECCS) pump flow.

The licensee stated, in Section 3.0 of the LAR, that the NAPS EDG loading calculation already assumes a 4400 V maximum. Therefore, the NRC staff finds that the proposed changes bring the TS SRs into agreement with the EDG loading calculation and do not change the existing calculation.

The licensee stated, in Section 3.0 of the LAR, that the NAPS fuel storage supply meets the UFSAR capacity requirements based on operating the EDG at full load (3000 kilowatts). Therefore, since the proposed changes do not impact the EDG loading calculation, the NRC staff finds that fuel storage capacity continues to meet the NAPS UFSAR requirements.

The licensee stated, in Section 3.0 of the LAR, that the NAPS exciter regulator specification is ± 1 percent. The licensee also stated that during recent EDG periodic testing, the maximum as-found voltage was never more than 4236 V. Therefore, the NRC staff finds that the proposed changes are within the capability of the regulator.

The NRC staff reviewed the LAR and found that the proposed changes do not impact ECCS pump flow calculations, EDG loading calculations, or EDG fuel consumption calculations. The NRC staff also found that the proposed changes are within the limits of the EDG governor and voltage regulator and make the maximum EDG voltage consistent with the existing maximum rated voltage of safety related loads. Therefore, the NRC staff concludes that the proposed changes meet the criteria of GDC 17, as incorporated into the North Anna UFSAR, and RG 1.9.

The EDGs are periodically tested for automatic starting and loading capability and ability to handle load rejection. The licensee stated, in Section 3.0 of the LAR, that a maximum steady state voltage of 4400 V is appropriate for surveillance testing. The proposed changes impact eight different SRs for maximum EDG voltage. The NRC staff reviewed the LAR and found that

the proposed changes of reducing the maximum EDG voltage are conservative. The NRC staff also concluded that the eight SRs continue to demonstrate the operability of the EDG system and, therefore, continue to meet the criteria of GDC 18, as incorporated into the North Anna UFSAR.

3.4 NRC Staff Conclusion

The NRC staff reviewed the proposed changes to NAPS, Units 1 and 2 TS SRs 3.8.1.2, 3.8.1.7, 3.8.1.9, 3.8.1.10, 3.8.1.11, 3.8.1.14, 3.8.1.17, and 3.8.1.18 for EDG testing. The changes would lower the maximum steady state EDG voltage from 4580 V to 4400 V in the SRs. Based on the above technical evaluation, the NRC staff has determined that the proposed TS changes will not negatively impact the capacity and capability of the safety-related electrical equipment required for accident mitigation and plant shutdown. Therefore, the NRC staff finds that the revised SRs provide the appropriate requirements to ensure that the necessary quality of the electrical equipment is maintained and that the associated LCOs will be met and concludes that there is reasonable assurance that the requirements of 10 CFR 50.36(c)(3) will continue to be met.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Commonwealth of Virginia official was notified of the proposed issuance of the amendments on December 19, 2019. The official confirmed that the Commonwealth had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and change 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 published in the *Federal Register* on June 18, 2019 (84 FR 28349). 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) 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 Contributors: S. Wyman, NRR

Date: January 17, 2020

SUBJECT: NORTH ANNA POWER STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 285 AND 268 TO REVISE TECHNICAL SPECIFICATIONS REGARDING EMERGENCY DIESEL GENERATOR MAXIMUM VOLTAGE LIMITS (EPID L-2019-LLA-0067) DATED JANUARY 17, 2020

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***via safety evaluation input**

****via e-mail**

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