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

June 23, 2021

Mr. Robert T. Simril
Site Vice President
Catawba Nuclear Station
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29745

Mr. Tom Ray
Site Vice President
McGuire Nuclear Station
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2, AND MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS TO CHANGE TECHNICAL SPECIFICATION 3.8.1, TO REDUCE EMERGENCY DIESEL GENERATOR MAXIMUM VOLTAGE (EPID NO. L-2020-LLA-0192)

Dear Mr. Simril and Mr. Ray:

The Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 308 and 304 to Renewed Facility Operating License NPF-35 and NPF-52 for the Catawba Nuclear Station, Units 1 and 2, respectively; and Amendment Nos. 318 and 297 to Renewed Facility Operating License Nos. NPF-9 and NPF-17 for the McGuire Nuclear Station, Units 1 and 2, respectively. The amendments consist of changes to the technical specifications (TSs) in response to your application dated August 19, 2020, as supplemented by letter dated January 29, 2021.

The amendments revise TS 3.8.1 to reduce the Emergency Diesel Generators' maximum allowed steady state voltage from ≤ 4580 volts (V) to ≤ 4320 V in several Surveillance Requirements of TS 3.8.1.

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

If you have any questions, please contact me at 301-415-5136.

Sincerely,

/RA/

John Klos, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-413, 50-414,
50-369 and 50-370

Enclosures:
1. Amendment No. 308 to NPF-35
2. Amendment No. 304 to NPF-52
3. Amendment No. 318 to NPF-9
4. Amendment No. 297 to NPF-17
5. Safety Evaluation

cc: Listserv

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

DUKE ENERGY CAROLINAS, LLC

NORTH CAROLINA ELECTRIC MEMBERSHIP CORPORATION

DOCKET NO. 50-413

CATAWBA NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 308
Renewed License No. NPF-35

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

A. The application for amendment to the Catawba Nuclear Station, Unit 1 (the facility) Renewed Facility Operating License No. NPF-35 filed by the Duke Energy Carolinas, LLC, acting for itself, and North Carolina Electric Membership Corporation (licensees), dated August 19, 2020, as supplemented by letter dated January 29, 2021, 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 set forth in 10 CFR Chapter I;

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 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-35 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, which are attached hereto, are hereby incorporated into this renewed operating license. Duke Energy Carolinas, LLC, 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 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

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Date: 2021.06.23 11:53:39 -04'00'

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

Attachment:
Changes to License No. NPF-35
and Technical Specifications

Date of Issuance: June 23, 2021

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

DUKE ENERGY CAROLINAS, LLC

NORTH CAROLINA MUNICIPAL POWER AGENCY NO. 1

PIEDMONT MUNICIPAL POWER AGENCY

DOCKET NO. 50-414

CATAWBA NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 304
Renewed License No. NPF-52

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment to the Catawba Nuclear Station, Unit 2 (the facility) Renewed Facility Operating License No. NPF-52 filed by the Duke Energy Carolinas, LLC, acting for itself, North Carolina Municipal Power Agency No. 1 and Piedmont Municipal Power Agency (licensees), dated August 19, 2020, as supplemented by letter dated January 29, 2021, 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 set forth in 10 CFR Chapter I;

   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 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-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 304, which are attached hereto, are hereby incorporated into this renewed operating license. Duke Energy Carolinas, LLC, 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 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

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Date: 2021.06.23 11:54:25 -04'00'

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

Attachment:
Changes to License No. NPF-52
and the Technical Specifications

Date of Issuance: June 23, 2021

ATTACHMENT TO

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

LICENSE AMENDMENT NO. 308

RENEWED FACILITY OPERATING LICENSE NO. NPF-35

DOCKET NO. 50-413

AND LICENSE AMENDMENT NO. 304

RENEWED FACILITY OPERATING LICENSE NO. NPF-52

DOCKET NO. 50-414

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

Remove	Insert
Licenses	Licenses
NPF-35, page 4	NPF-35, page 4
NPF-52, page 4	NPF-52, page 4
TSs	TSs
3.8.1-11	3.8.1-11
3.8.1-13	3.8.1-13
3.8.1-14	3.8.1-14
3.8.1-15	3.8.1-15
3.8.1-16	3.8.1-16
3.8.1-18	3.8.1-18
3.8.1-20	3.8.1-20
3.8.1-21	3.8.1-21

(2) TECHNICAL SPECIFICATIONS

The Technical Specifications contained in Appendix A, as revised through Amendment No. 308 which are attached hereto, are hereby incorporated into this renewed operating license. Duke Energy Carolinas, LLC shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than December 6, 2024, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

(4) Antitrust Conditions

Duke Energy Carolinas, LLC shall comply with the antitrust conditions delineated in Appendix C to this renewed operating license.

(5) Fire Protection Program

Duke Energy Carolinas, LLC shall implement and maintain in effect all provisions of the approved fire protection program that complies with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment request dated September 25, 2013; as supplemented by letters dated January 13, 2015; January 28, 2015; February 27, 2015; March 30, 2015; April 28, 2015; July 15, 2015; August 14, 2015; September 3, 2015; December 11, 2015; January 7, 2016; March 23, 2016; June 15, 2016; August 2, 2016; September 7, 2016; and January 26, 2017, as approved in the SE dated February 8, 2017. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

(2) TECHNICAL SPECIFICATIONS

The Technical Specifications contained in Appendix A, as revised through Amendment No. 304, which are attached hereto, are hereby incorporated into this renewed operating license. Duke Energy Carolinas, LLC shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than December 6, 2024, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section

(4) Antitrust Conditions

Duke Energy Carolinas, LLC shall comply with the antitrust conditions delineated in Appendix C to this renewed operating license.

(5) Fire Protection Program

Duke Energy Carolinas, LLC shall implement and maintain in effect all provisions of the approved fire protection program that complies with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment request dated September 25, 2013, as supplemented by letters dated January 13, 2015; January 28, 2015; February 27, 2015; March 30, 2015; April 28, 2015; July 15, 2015; August 14, 2015; September 3, 2015; December 11, 2015; January 7, 2016; March 23, 2016; June 15, 2016; August 2, 2016; September 7, 2016; and, January 26, 2017, as approved in the SE dated February 8, 2017. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	----------NOTES---------- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG 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. ---------- Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 3950 V and $\leq$ 4320 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts from standby condition and achieves in $\leq$ 11 seconds voltage of $\geq$ 3950 V and frequency of $\geq$ 57 Hz and maintains steady-state voltage $\geq$ 3950 V and $\leq$ 4320 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	----------NOTE---------- If performed with the DG synchronized with offsite power, it shall be performed at a power factor $\leq$ 0.9. ---------- Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is $\leq$ 63 Hz; b. Within 3 seconds following load rejection, the voltage is $\geq$ 3950 V and $\leq$ 4320 V; and c. Within 3 seconds following load rejection, the frequency is $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	Verify each DG does not trip and generator speed is maintained $\leq$ 500 rpm during and following a load rejection of $\geq$ 5600 kW and $\leq$ 5750 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.11 ----------NOTES---------- 1. All DG 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes the emergency bus in $\leq$ 11 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage $\geq$ 3950 V and $\leq$ 4320 V, 4. maintains steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz, and 5. supplies auto-connected shutdown loads for $\geq$ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTE---------- All DG starts may be preceded by prelube period. ----------	
	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and:	In accordance with the Surveillance Frequency Control Program
	a. In ≤ 11 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and ≤ 4320 V;	
	b. In ≤ 11 seconds after auto-start and during tests, achieves frequency ≥ 58.8 Hz and ≤ 61.2 Hz;	
	c. Operates for ≥ 5 minutes; and	
	d. The emergency bus remains energized from the offsite power system.	

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.15 ----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 5600 kW and ≤ 5750 kW or until operating temperature is stabilized. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts and achieves, in ≤ 11 seconds, voltage ≥ 3950 V, and frequency ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ 4320 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.16 ----------NOTE---------- 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG: 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 standby operation.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes the emergency bus in ≤ 11 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 3950 V and ≤ 4320 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTE---------- All DG starts may be preceded by an engine prelube period. --- Verify when started simultaneously from standby condition, each DG achieves, in $\leq$ 11 seconds, voltage of $\geq$ 3950 V and frequency of $\geq$ 57 Hz and maintains steady state voltage $\geq$ 3950 V and $\leq$ 4320 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-369

MCGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 318
Renewed License No. NPF-9

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. NPF-9, filed by the Duke Energy Carolinas, LLC (licensee), dated August 19, 2020, as supplemented by letter dated January 29, 2021, 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 set forth in 10 CFR Chapter I;

   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 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-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 318, are hereby incorporated into this renewed operating 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 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

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Date: 2021.06.23 11:55:44 -04'00'

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

Attachment:
Changes to License No. NPF-9
and the Technical Specifications

Date of Issuance: June 23, 2021

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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-370

MCGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 297
Renewed License No. NPF-17

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. NPF-17, filed by the Duke Energy Carolinas, LLC (the licensee), dated August 19, 2020, as supplemented by letter dated January 29, 2021, 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 set forth in 10 CFR Chapter I;

   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 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-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 297, are hereby incorporated into this renewed operating 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 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

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Date: 2021.06.23 11:56:22 -04'00'

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

Attachment:
Changes to License No. NPF-17
and the Technical Specifications

Date of Issuance: June 23, 2021

ATTACHMENT TO

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

LICENSE AMENDMENT NO. 318

RENEWED FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

LICENSE AMENDMENT NO. 297

RENEWED FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

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

Remove	Insert
Licenses	Licenses
NPF-9, page 3	NPF-9, page 3
NPF-17, page 3	NPF-17, page 3
TSs	TSs
3.8.1-10	3.8.1-10
3.8.1-12	3.8.1-12
3.8.1-13	3.8.1-13
3.8.1-14	3.8.1-14
3.8.1-15	3.8.1-15
3.8.1-17	3.8.1-17
3.8.1-19	3.8.1-19
3.8.1-20	3.8.1-20

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, 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;

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as may be produced by the operation of McGuire Nuclear Station, Units 1 and 2, and;

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such byproduct material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations 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

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 318, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than June 12, 2021, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

(4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, 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;

(5) Pursuant to the Act and 10 CFR Parts, 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as my be produced by the operation of McGuire Nuclear Station, Units 1 and 2; and,

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such by product material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations 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 thereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 297, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than March 3, 2023, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59, and otherwise complies with the requirements in that section.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	----------NOTES---------- 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG 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. ---------- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	----------NOTES---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts from standby condition and achieves in ≤ 11 seconds voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	----------NOTES---------- 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	Verify each DG, when connected to its bus in parallel with offsite power and operating with maximum kVAR loading that offsite power conditions permit, rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 63 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ 4320 V; and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	Verify each DG does not trip and voltage is maintained ≤ 4784 V during and following a load rejection of ≥ 3600 kW and ≤ 4000 kW.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.11 ----------NOTES---------- 1. All DG 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes the emergency bus in ≤ 11 seconds, 2. energizes auto-connected blackout loads through automatic load sequencer, 3. maintains steady state voltage ≥ 3740 V and ≤ 4320 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies auto-connected blackout loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- All DG starts may be preceded by prelube period. ---------- Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ 11 seconds after auto-start signal achieves voltage of ≥ 3740 and during tests, achieves steady state voltage ≥ 3740 V and ≤ 4320 V; b. In ≤ 11 seconds after auto-start signal achieves frequency of ≥ 57 Hz and during tests, achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; and d. The emergency bus remains energized from the offsite power system.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.15 ----------NOTES---------- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 3600 kW and ≤ 4000 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ---------- Verify each DG starts and achieves, in ≤ 11 seconds, voltage ≥ 3740 V, and frequency ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ 4320 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.16 ----------NOTES---------- 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify each DG: 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 standby operation.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG 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 plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes the emergency bus in ≤ 11 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 3740 V and ≤ 4320 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies auto-connected emergency loads for ≥ 5 minutes.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.20	----------NOTES---------- All DG starts may be preceded by an engine prelube period. --- Verify when started simultaneously from standby condition, each DG achieves, in ≤ 11 seconds, voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ 4320 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NOS. 308 and 304

TO RENEWED FACILITY OPERATING LICENSE NPF-35 AND NPF-52

DUKE ENERGY CAROLINAS, LLC

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

AND

LICENSE AMENDMENT NOS. 318 and 297

TO RENEWED FACILITY OPERATING LICENSE NPF-9 AND NPF-17

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By application dated August 19, 2020 (Reference 1), as supplemented by letter dated January 29, 2021 (Reference 2), Duke Energy Carolinas, LLC (Duke, the licensee), requested changes to the technical specifications (TSs) for the Catawba Nuclear Station, Units 1 and 2 (CNS or Catawba), and the McGuire Nuclear Station, Units 1 and 2 (MNS or McGuire). The supplement dated January 29, 2021, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published the *Federal Register* on October 6, 2020 (85 FR 63146). The staff submitted a duplicate publication in the *Federal Register* on December 29, 2020 (85 FR 85674), that did not change the staff's proposed no significant hazards consideration determination as originally published.

The proposed changes would revise TS 3.8.1 to reduce the Emergency Diesel Generators' (EDG) maximum allowed steady state voltage from ≤ 4580 volts (V) to ≤ 4320 V in several Surveillance Requirements (SR) of TS 3.8.1.

2.0 REGULATORY EVALUATION

2.1 Description of the Onsite Emergency AC Power System

Both Catawba and McGuire have similar onsite emergency alternating current (AC) power systems. As the licensee stated in its submittal dated August 19, 2020:

> Each train of the 4160 V essential auxiliary power system is also provided with a separate and independent emergency diesel generator that can supply the Class 1E loads required to safely shutdown the unit following a design basis accident. Each diesel generator is designed to attain rated voltage and frequency and to accept load within 11 seconds after receipt of a start signal. The characteristics of the generator exciter and voltage regulator provide satisfactory starting and acceleration of sequenced loads and ensure rapid voltage recovery when starting large motors. The EDGs will automatically start if a safety injection signal is received or upon predetermined degraded voltage conditions or upon a loss of offsite power. The EDG output breakers automatically close and supply their associated 4160 V essential auxiliary power system when bus voltage drops below a pre-determined setpoint.

2.2 Reason for Proposed Change

As the licensee stated in its submittal dated August 19, 2020:

> During the 2018 Design Basis Assurance Inspection at MNS the NRC [U. S. Nuclear Regulatory Commission] questioned the maximum steady state voltage limit of 4580 V stated in the TS 3.8.1 Surveillance Requirements. As a result, a Nuclear Condition Report (NCR) was generated to provide for and document a review of the issue within the Corrective Action Program (CAP). Administrative controls were implemented at MNS to limit the maximum steady state voltage.
>
> Based on the operating experience from MNS, CNS initiated an NCR to provide for a similar review. As a result of this review, CNS also established administrative controls to limit the maximum steady state voltage.

In its supplement dated January 29, 2021, the licensee provided its response to the Request for Additional Information (RAI) No. 1 and explained why the current TS EDG maximum steady state voltage limit of ≤4580 V is considered non-conservative and stated:

> Current Technical Specification 3.8.1 EDG maximum steady state voltage limit is 4580 V which is 4160 V plus 10%. Technical Specification Bases 3.8.1 states “The specified maximum steady state output voltage of 4580 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages.” However, NEMA MG 1, [National Electrical Manufacturers Association, Motors and Generators Standard 1] Section 12.44.1 requires ac induction motors to operate at plus or minus 10 percent of rated voltage, which equates to an operating voltage range of 3600 - 4400 V for 4000 V motors. Overvoltage studies were performed at MNS and CNS that concluded no overvoltage condition was identified for loads (required for a loss of offsite power with or without a loss of coolant accident) on the 4160 V and corresponding 600 V level when the EDG is set to 104.1 % (MNS) and 104% (CNS) of nominal voltage. Although MNS and CNS have not experienced any

4000 V motor failures as a result of operating equipment at higher voltages, Technical Specification 3.8.1 was identified as being non-conservative because it allowed operating 4000 V motors up to 4580 V (steady state) when powered by EDGs, which exceeded the standard design limit of 4400 V. MNS NCR 2185262 (2018 DBAI -Tech Spec 3.8.1 DG Max Steady-State Voltage Limit) was initiated during the 2018 DBAI and is listed in the McGuire Nuclear Station – NRC Design Bases Assurance Inspection (Team) Report 05000369/2018010 and 05000370/2018010," dated April 12, 2018 (ADAMS Accession no. ML18103A158) [(Reference 3)] in the section for Condition Reports written due to this Inspection.

Administrative controls included procedure revisions to establish a reduced upper EDG output voltage limit.

2.3 Proposed TS Changes

In the LAR, the licensee stated that the steady state maximum voltage limit is currently specified as ≤ 4580 V in each of the TS SRs listed below. The proposed amendment proposes a new limit as ≤ 4320 V, to ensure the affected equipment can operate within its design and analysis requirements.

2.3.1 Catawba Proposed TS Changes

Changed TS SRs are indicated in **BOLD** font as provided below.

Current TS SR 3.8.1.2 states:

> Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3950 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.2 would state:

> Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3950 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.7 states:

> Verify each DG starts from standby condition and achieves in ≤ 11 seconds voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.7 would state:

> Verify each DG starts from standby condition and achieves in ≤ 11 seconds voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.9 states, in part:

> b. Within 3 seconds following load rejection, the voltage is ≥ 3950 V and ≤ **4580** V; and

Revised TS SR 3.1.8.9 would state, in part:

b. Within 3 seconds following load rejection, the voltage is ≥ 3950 V and ≤ **4320** V; and

Current TS SR 3.8.1.11 states, in part:

3. maintains steady state voltage ≥ 3950 V and ≤ **4580** V,

Revised TS SR 3.8.1.11 would state, in part:

3. maintains steady state voltage ≥ 3950 V and ≤ **4320** V,

Current TS SR 3.8.1.12 states, in part:

a. In ≤ 11 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and ≤ **4580** V;

Revised TS SR 3.8.1.12 would state, in part:

a. In ≤ 11 seconds after auto-start and during tests, achieves voltage ≥ 3950 V and ≤ **4320** V;

Current TS SR 3.8.1.15 states:

Verify each DG starts and achieves, in ≤ 11 seconds, voltage ≥ 3950 V, and frequency ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4580** V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.15 would state:

Verify each DG starts and achieves, in ≤ 11 seconds, voltage ≥ 3950 V, and frequency ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4320** V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.19 states, in part:

3. achieves steady state voltage ≥ 3950 V and ≤ **4580** V,

Revised TS SR 3.8.1.19 would state, in part:

3. achieves steady state voltage ≥ 3950 V and ≤ **4320** V,

Current TS SR 3.8.1.20 states:

Verify when started simultaneously from standby condition, each DG achieves in ≤ 11 seconds, voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised RS SR 3.8.1.20 would state:

> Verify when started simultaneously from standby condition, each DG achieves in ≤ 11 seconds, voltage of ≥ 3950 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3950 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

2.3.2 McGuire Proposed TS Changes

Changed TS SRs are indicated in **BOLD** font as provided below

Current TS SR 3.8.1.2 states:

> Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.2 would state:

> Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3740 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.7 states:

> Verify each DG starts from standby condition and achieves in ≤ 11 seconds voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.7 would state:

> Verify each DG starts from standby condition and achieves in ≤ 11 seconds voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.9 states, in part:

> b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ **4580** V; and

Revised TS SR 3.8.1.9 would state, in part:

> b. Within 3 seconds following load rejection, the voltage is ≥ 3740 V and ≤ **4320** V; and

Current TS SR 3.8.1.11 states, in part:

> 3. maintains steady state voltage ≥ 3740 V and ≤ **4580** V,

Revised TS SR 3.8.1.11 would state, in part:

> 3. maintains steady state voltage ≥ 3740 V and ≤ **4320** V,

Current TS SR 3.8.1.12 states, in part:

> a. In ≤ 11 seconds after auto-start signal achieves voltage of ≥ 3740 and during tests, achieves steady state voltage ≥ 3740 V and ≤ **4580** V;

Revised TS SR 3.8.1.12 would state, in part:

> a. In ≤ 11 seconds after auto-start signal achieves voltage of ≥ 3740 and during tests, achieves steady state voltage ≥ 3740 V and ≤ **4320** V;

TS SR 3.8.1.15 states:

> Verify each DG starts from standby condition and achieves, in ≤ 11 seconds, voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4580** V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.15 would state:

> Verify each DG starts from standby condition and achieves, in ≤ 11 seconds, voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4320** V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Current TS SR 3.8.1.19 states, in part:

> 3. achieves steady state voltage ≥ 3740 V and ≤ **4580** V,

Revised TS SR 3.9.1.19 would state, in part:

> 3. achieves steady state voltage ≥ 3740 V and ≤ **4320** V,

Current TS SR 3.8.1.20 states:

> Verify when started simultaneously from standby condition, each DG achieves, in ≤ 11 seconds, voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4580** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

Revised TS SR 3.8.1.20 would state:

> Verify when started simultaneously from standby condition, each DG achieves, in ≤ 11 seconds, voltage of ≥ 3740 V and frequency of ≥ 57 Hz and maintains steady state voltage ≥ 3740 V and ≤ **4320** V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

2.4 Regulatory Requirements and Guidance

The staff applied the following NRC regulations for review of the 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 (10 CFR 50.36(b)). The regulation at 10 CFR 50.36(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."

Title 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 17, which 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 capability to assure 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.

Title 10 CFR Part 50, Appendix A, GDC 18, which states:

> 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

The staff also reviewed the LAR considering the following guidance documents:

Regulatory Guide (RG) 1.9, Revision 2, "Selection, Design, and Qualification of Diesel-Generator Units Used As Standby (Onsite) Electric Power Systems At Nuclear Power Plants" (Reference 4), as described in the CNS Updated Final Safety Analysis Report (UFSAR) Chapter 8 (Reference 5).

RG 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used As Class 1E Onsite Electric Power Systems At Nuclear Power Plants" (Reference 6), as described in the MNS UFSAR Chapter 8 (Reference 7).

Pressurized Water Reactor Owners Group (PWROG) prepared Topical Report WCAP-17308-NP-A Revision 0, "Treatment of Diesel Generator (DG) Technical Specification Frequency and Voltage Tolerances," (Reference 8).

3.0 TECHNICAL EVALUATION

In the LAR, the licensee provided various justifications for reducing the maximum steady state voltage limits of the EDGs stated in the various TS 3.8.1 SRs from ≤ 4580 V to ≤ 4320 V, which are discussed as follows.

3.1 Impact on Plant Safety Analyses

In its submittal dated August 19, 2020, the licensee stated that:

> As stated in WCAP-17308-NP [(Reference 9)], plant safety analyses make specific assumptions regarding emergency core cooling system (ECCS) flow to provide the core cooling function to mitigate an accident. The analyses require minimum flow values which correspond to a minimum voltage. As shown in IEEE [Institute of Electrical and Electronics Engineers] Std 666-2007, Table 5.3 [(Reference 10)], induction motor slip increases at 90 percent rated voltage and decreases at 110 percent rated voltage. A decrease in motor slip results in higher motor speed and higher system flow. Therefore, the proposed change to reduce the TS SRs maximum voltage has no impact on the minimum analyzed ECCS flow, since it is based on minimum voltage (and frequency) [minimum values are not being changed in this LAR]. The impact of higher than nominal voltage and pump speed has been reviewed to ensure existing analyses that consider maximum pump flow rates are not impacted.

The NRC staff finds that the justification provided by the licensee is reasonable because reducing the EDG maximum voltage from ≤ 4580 V to ≤ 4320 V will have no impact on the minimum analyzed ECCS flow, in part, because it is based on minimum voltage (TS value of ≥3740 V) and not on the maximum voltage. The staff notes that minimum values are not being changed in this LAR. The staff finds that justification is consistent with the discussion provided in the WCAP-17308-NP-A report (Reference 8), with no deviation from the staff evaluation of the WCAP-17308-NP (Reference 9), and the industry standard (IEEE Std 666-2007), and is, therefore, acceptable.

3.2 Impact on EDG loadings

In its submittal dated August 19, 2010, the licensee stated that the MNS and CNS EDG loading calculations assume a maximum voltage of 4580 V, which bounds the proposed change to the TS SRs.

In its supplement dated January 29, 2021, the licensee provided its response to RAI No. 2 and stated analysis results for MNS and CNS EDG kilo-Watt (kW) loading during a loss-of-coolant accident (LOCA) and Blackout conditions determined that the proposed 4320 V is bounded by the current EDG maximum steady state voltage limit of 4580 V (at 110% of 4160 V rated voltage) and 61.2 Hz (102 percent of rated frequency). The licensee stated that the kW load margin is more conservative than a value calculated using 4320 V.

The NRC staff finds that reducing the EDG maximum voltage to a value of ≤4320 V will have a minimum impact on EDG loadings. Based on IEEE Std 666-2007, induction motors will run at slightly reduced speed at 4320 V as compared to 4580 V. The reduction in speed will result in a slight reduction in induction motor kW loadings. Therefore, the EDG loadings at 4320 V will be slightly lower, and, therefore, more kW margin with respect to current calculated loadings at 4580 V will be available. Therefore, the staff finds the proposed change is also conservative with respect to EDG loadings.

3.3 Impact on Overvoltage of Loads

In its submittal dated August 19, 2020, the licensee stated that overvoltage studies were performed that identified no overvoltage condition for loads (required for a loss of offsite power with or without a LOCA) on the 4160 V level and corresponding 600 V level when the EDG is set to 104.1% (MNS) and 104% (CNS) of nominal voltage.

The NRC staff finds that the reducing the maximum EDG voltage to 4320 V will have no impact on overvoltage of loads, because the proposed voltage limit of 4320 V [103.8% of 4160 V] is bounded by the maximum voltage level studied for the purpose of identifying any overvoltage, and is, therefore, acceptable.

3.4 Impact on Operating Voltage Range of EDGs

In its submittal dated August 19, 2020, the licensee stated that:

> A properly operating EDG governor and voltage regulator will be able to control voltage around a nominal value within the manufacturer's specified tolerances. The MNS EDG voltage regulator/exciter is designed to control within ± 0.5 percent of the nominal setting for any load variation and power factor. The purchase specification for the CNS EDG voltage regulator does not have a similar requirement; however, plant procedures used to set-up the CNS voltage regulators require operation at 4160 ± 40 V, which is a tolerance of approximately ± 1 percent. Testing results demonstrate the ability of the regulators to control voltage.
>
> Therefore, lowering of the maximum allowable steady state voltage from 4580 V to 4320 V is within the capabilities of the EDG voltage regulator.

Based on the above, the NRC staff finds reasonable assurance that the MNS and CNS voltage regulators can control the EDG voltage within a range of approximately ± 0.5 to ± 1 percent,

respectively. Therefore, the operating voltage range of EDGs will remain bounded by the proposed maximum steady state voltage of 4320 V (+104%), and is, therefore, acceptable.

The EDGs are periodically tested for automatic starting and loading capability. The licensee stated, in Section 2.3 of its submittal dated August 19, 2020, that the lower maximum steady state voltages are appropriate for surveillance testing. The proposed changes impact eight different SRs for maximum EDG voltage. The NRC staff reviewed the licensee's submittal dated August 19, 2020, 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 intent of RG 1.9, as incorporated into the MNS and CNS UFSARs.

3.5 Impact on Operation of Safety Related Motors

In its submittal dated August 19, 2020, the licensee stated that the industrial standard NEMA MG 1 (Reference 11), is frequently cited for motor design. NEMA MG 1, Section 12.44.1, requires AC induction motors to operate at ± 10 percent of rated voltage. The licensee stated that motor maximum voltage limits are typically not quantified in the specifications of safety related motors; however, MNS specifications commonly cite MG 1-1967 and CNS specifications commonly cite MG 1-1972.

Based on the above, the NRC staff finds that reducing the maximum steady state voltage of the EDGs to a value of 4320 V (+104%) will have no adverse impact on the operation of safety related motors which have steady state operation capability within a range of ± 10 percent of rated voltage.

3.6 Conclusion

Based on the above, the staff finds that there is reasonable assurance that the proposed changes by the licensee to reduce the TS SRs maximum voltage from ≤ 4580 V to ≤ 4320 V will not have an adverse impact on (1) Plant Safety Analyses; (2) EDG loadings; (3) Impact on Overvoltage of Loads; (4) Operating Voltage Range of EDGs; and (5) Operation of Safety Related Motors. The NRC staff finds the proposed TS changes to reduce the maximum steady state voltage limits of the EDGs in various SRs of TS 3.8.1, are conservative and the supporting analysis reasonable assurance of safe operation and shutdown capability at the revised TS SR value of ≤ 4320 V. The revised SRs would continue to serve the purpose of EDG testing and inspection to assure that 10 CFR 50.36(c)(3) would continue to be met. The proposed TS changes would not impact the licensee's current compliance with GDC 17 and 18, and applicable versions of RG 1.9. The proposed changes were evaluated in accordance with the WCAP-17308-NP-A guidance and other industrial standards described in this safety evaluation. Therefore, the staff finds the proposed TS SR changes are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the North Carolina and South Carolina State officials were notified of the proposed issuance of the amendments on May 27, 2021. On May 27, 2021, the State officials confirmed that the State of North Carolina and the State of South Carolina had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirement 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 published in the *Federal Register* on October 6, 2020 (85 FR 63146), and there has been no public comment on such finding. The staff submitted a duplicate publication in the *Federal Register* on December 29, 2020 (85 FR 85674), and there has been no public comment on such finding. 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.

7.0 REFERENCES

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Date: June 23, 2021

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2, AND MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS TO CHANGE TECHNICAL SPECIFICATION 3.8.1, TO REDUCE EMERGENCY DIESEL GENERATOR MAXIMUM VOLTAGE (EPID NO. L-2020-LLA-0192) DATED JUNE 23, 2021

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